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By Email to:
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Andy Cook, Manager, 2018 California State Rail Plan
Division of Rail and Mass Transportation, Rail Planning Branch
California Department of Transportation
1120 N Street, MS 74
Sacramento, CA 95814

Re: Draft 2018 State Rail Plan

Dear Mr. Cook:

The Train Riders Association of California ("TRAC") is a statewide rail advocacy organization that has worked for over three decades to improve passenger rail service. TRAC was an original sponsor of 1990's Proposition 116, which was critical to the development of the State-funded intercity services. TRAC is very supportive of the overall direction of the Draft 2018 State Rail Plan ("Plan"). All page references are to the Plan, unless otherwise noted.

This letter identifies the elements of the overall framework of the Plan that we support, while calling out the following problem areas:

1. Reliance on HSR as the backbone of the network. Because of the project's shaky finances, we believe a fallback plan is needed to preserve the integrity of the Plan.

2. Reliance on CTP 2040 as the policy framework. CTP 2040 did not provide a pathway to an 80% reduction in GHG emissions by 2050. A Rail Plan based on it will therefore underappreciate the State's need for rail infrastructure. The Plan thus is inadequate for achieving the 80% reduction that is the State's climate goal.

3. A seeming default preference for continued sharing of freight tracks with passenger service.

4. A seeming default preference for achieving zero-emissions with catenary-based electrification rather than new-technology vehicles.

5. The absence of a plan to deal with the unreasonably high costs of public infrastructure.

6. The inadequate attention to accessibility.

I. TRAC's Support for the Plan's Foundation

The Plan's Goal

We agree with the overall approach of the Plan but feel that its goal is not succinctly stated. We nominate the following statement to be the overarching goal of the Plan: "offering convenient, reliable, and auto-competitive alternative travel and goods movement." (Page 3) Our paper, "Intercity Passenger Trains Are Not Commuter Trains" (Attachment #1) stresses the point that offering travel times that beat auto travel is the key to successful intercity rail.

Network Focus

TRAC greatly appreciates the SMA consulting team's contribution to the Plan. They have brought to California the principles that made Switzerland the best rail system in the world. We wholeheartedly agree that California needs a network based on the following quotes from the Plan:

> ... a statewide vision describing a future integrated rail system that provides comprehensive and coordinated service to passengers through more frequent service, and convenient transfers between rail services and transit. (Page 3)
>
> ... facilitates network-wide coordination through scheduled, or “pulsed, ” transfers. (Page 3)
>
> ... the State has committed to fund transformative capital improvements that focus on connectivity between systems. (Page 6)
>
> Transit and rail connectivity can be greatly enhanced by significant innovations in integrated ticketing systems that allow reliable linked transit trips. (Page 7)
>
> The 2040 Vision ... physically integrates services at hub stations, allowing for seamless transfers between services, and convenient trips by rail across the state. (Page 101)

> ... an integrated passenger rail network that focuses on the customer experience, and is oriented towards service enhancement and delivery... (Page 226)

However, we believe that the 2040 Vision does not adequately stress the need for fast intercity service to tie the network together. This is likely due to the assumption that HSR will fill that need. If HSR does not become operational, however, intercity corridor services will need to be much faster, to meet the strong intercity demand generated by regional rail.

Climate Change

TRAC likewise fully supports the State's efforts "to lead in efforts to curb climate change" (Page 2) We support the following quotes from the Plan:

> External costs include harmful pollutants emitted by motor vehicles, airports, railroads, and seaports. These pollutants adversely affect public health and contribute to global climate change, which jeopardizes the State's ecological and economic future. (Page 5)
>
> The transportation sector must play a large role in these reductions, which are the most aggressive in the country. (Page 6)
>
> A more extensive and efficient rail system can reduce the transportation sector's substantial GHG emissions. (Page 6)
>
> ... the anticipated mode shift from highways to rail will reduce carbon dioxide emissions per passenger mile of travel by nearly 20 times. (Page 6)
>
> Because rail travel generates significantly lower GHG emissions per passenger mile and freight ton-mile than autos and trucks, investment in rail facilities promotes progress toward meeting State GHG emissions reduction goals. (Page 27)
>
> All State infrastructure planning and investments need to be made in a manner that facilitates meeting the State's climate goals, and prioritizes actions that both build climate preparedness and reduce GHG emissions. (Page 109)
>
> ... work to increase the number of seats filled on each train operated (often referred to as the load factor), to reduce GHG emissions per passenger mile. (Page 109)
>
> By 2040, Caltrans expects a majority of passenger miles on the rail system to be provided by electric trains. (Page 109)

> ... to develop network infrastructure that takes known and projected climate change impacts into account. (Page 109)
>
> In the coming years, alternative fuels, better propulsion technologies, and new, lighter equipment (including the equipment used to electrify Caltrain commuter rail service) are expected to further reduce the GHGs emitted by rail systems. (Page 7)

See Electrification section below for comments on more cost-effective GHG emissions reductions. Because the emissions from construction materials (especially cement) have been consistently ignored, the HSR project will be a net generator of GHGs for decades, even if HSR operates. (See http://transdef.org/HSR/ARB.html) Due to the nearness of the climate change tipping point, the eventual GHG emissions reductions will likely come too late for the climate, making the largest expenditure category of Cap and Trade funds a failed opportunity to protect the climate.

Private Sector Involvement

TRAC strongly supports the Plan's bold outreach to the private sector, as captured in the following quotes:

> The State expects that increased passenger rail revenues generated from increased use of the system will, in the ultimate 2040 Vision, allow the state network services to operate without a subsidy, and generate profits in some corridors that can be reinvested in maintaining and improving the system. (Page 111)
>
> The State supports public-public partnerships as well as public-private partnerships to deliver a variety of project types. Partnerships between service providers and local governments, especially in regard to land use and station development, will be mutually beneficial in terms of maximizing the value of the rail service, maximizing the value of local real estate, and maximizing return on investment of local dollars. (Page 111)
>
> In addition to coordination among government entities, innovative partnerships will be needed to integrate rail services with private entities. Such partnerships would include both private operations of public rail services and coordination with private-sector providers of non-rail connecting services, such as airlines, rideshare operators, and private bus operators. (Page 111)
>
> It is anticipated that use of public-private partnerships and agreements will increase as California implements its network integration. (Page 112)

The potential for profit identified in the first quote is what makes investment by the private sector in public rail projects a realistic possibility. Besides operating profits, station area improvements will be attractive to private operators as real estate investments. TRAC sees private sector participation as critical, because it is the only way we see to break the dangerous trend of public agency rail projects costing far too much.

Because the private sector is operating with its own money, it is very cost-conscious, a trait noticeably lacking in the public sector. The private sector also is more sensitive than the public sector to designing passenger services that meet potential passenger needs and demands so as to entice them to pay high fares for the privilege of riding.

TRAC believes that standard agency practice now is to "gold-plate" projects, where consultants write specifications far in excess of what private railroads would do. This benefits the consultants' and contractors' self-interest, while short-changing the public. As a result, fewer projects get built, and they are more expensive to operate. While the most egregious example of this dynamic is California High-Speed Rail, the practice has become universal in the public transportation industry. New York exemplifies this trend:

> Daily ridership has nearly doubled in the past two decades to 5.7 million, but New York is the only major city in the world with fewer miles of track than it had during World War II. Efforts to add new lines have been hampered by generous agreements with labor unions and private contractors that have <u>inflated construction costs to five times the international average</u>. (Page 2, Attachment #3, "How Politics and Bad Decisions Starved New York's Subways"; emphasis added.)
>
> At the same time, public officials who have taken hundreds of thousands of dollars in political contributions from M.T.A. unions and contractors have pressured the authority into signing agreements with labor groups and construction companies that obligated the authority to pay far more than it had planned. (Page 3, *Id.*)

While we are supportive of heavy private sector involvement in transportation, we disagree with the Plan's proposal to spend public money supporting freight capacity on trade corridors. (Page 202) It is in the interest of the Class 1s to attract more traffic, and to expend the capital required to provide the needed capacity. Public subsidies for freight rail as proposed here would go straight to the railroads' bottom line.

TRAC strongly agrees with "Short-haul trains can serve as efficient transportation between ports and distribution centers." (Page 110) We see shifting freight traffic from truck to rail as a top environmental priority. Please see Attachment #4, "Moving Short-Distance Truck Freight to Rail."

Instead of direct payments to the Class 1s, a better way to accomplish this freight mode shift would be to use incentives similar to those for the buyers of ZEVs. It would be more efficient for the State to offer vouchers to shippers, to make shipping by rail less

costly than truck shipping. Acceptance of the voucher would commit the shipper to not be putting more trucks on the road. As the cost of rail shipping drops, the voucher amount would decline and eventually disappear.

II. TRAC's Principal Disagreements with the Plan

Rail Congestion

Existing freight corridors shared with passenger service are getting congested in places. (Page 8) The most important policy question that was not adequately addressed by the Plan is whether new capacity should be added on Class I railroads' rights-of-way, or whether a better alternative for the long-term would be to invest in passenger-only state-owned tracks. The studies done in preparation for the Plan should provide enough information to enable the team to make recommendations for each corridor. Preserving new rights-of-way will require getting clear about which corridors need them. This is most definitely a policy debate that should occur sooner rather than later.

The Plan suggests the possibility that TRAC favors:

> "The partners may conclude that future growth needs will require investing in dedicated passenger rail infrastructure for all or a portion of a corridor." (Page 124)

The infrastructure requirements of freight-hauling railroads intended to divert traffic from trucks are very different from the infrastructure requirements of passenger-hauling railroads intended to divert passengers from automobiles and airplanes. For each to achieve their respective missions, separate infrastructure for each is required. While possibly more expensive than sharing tracks, this approach eliminates dispatching conflicts and ensures adequate capacity for growth without the demands for publicly financed, privately owned improvements.

Passenger-only tracks can have higher speeds and possibly lower maintenance costs, as these tracks are not pounded by heavy freight trains. TRAC believes that the time has come to invest in fast passenger rail services that are largely independent of freight services, where justified by high passenger demand. On the other hand, passenger demand, for example, between Indio and Yuma would probably not be high enough to warrant dedicated track.

For these reasons, we oppose this proposal: "The infrastructure investments necessary for increased passenger train volumes will be planned so as to add capacity and flexibility to freight operations." (Page 111) (While we recognize that creating separate passenger tracks will restore capacity to the existing freight facilities, we assume that is not what that statement was intended to mean.)

As an example of what we want to see in the future, we direct Caltrans to our proposal for the Altamont Corridor (Attachment #2), which could conceivably be implemented as a public-private partnership.

Mobility

An understanding of the challenge that growth poses to the existing highway network is critical to obtaining the resources needed to build out the statewide network described in the Plan. The Trends and Opportunities section (Page 4) underappreciates the significance of rail in CA's future. We disagree with the phrase "a key role":

> Rail forms an increasingly integral part of California's transportation system, and will play a key role in accommodating the growth of this system. (Page 14)

TRAC sees rail as playing the key role to accommodate the growth in the system. It is clear to us that a continuation of sprawl will generate so much Single-Occupant travel demand that roads and highways will descend into gridlock.

The State cannot build its way out of this outcome with more roads. (See Attachment #6 on the Triple Convergence.) It isn't physically possible to provide facilities for all of the projected residents to drive alone. The only known way out of this crisis is road pricing, something that is politically difficult to implement. (See Attachment #5, an article on Stockholm's successful implementation of congestion pricing.)

Road pricing dethrones driving as the default mode by encouraging a conscious choice of travel mode. Transit can then compete with driving in delivering an optimal mix of travel time savings, convenience and cost. With road pricing, roads will operate at just above gridlock. As many trips are priced off the roads, convenient alternative modes need to be available. Expanded rail and transit service is the only hope to preserve mobility, making mode shift all but inevitable. These mode-shifters will find higher speed commuter and intercity rail corridors to be acceptable alternatives.

Without road pricing, the road system will gridlock. While the gridlocked road system will swell demand for high-quality rail corridors, both for commuter services as well as for higher speed inter-regional services, it will have harsh impacts on the economy. The Plan should be designed to avoid such consequences.

Given these considerations, TRAC believes that the aspirational goal of seeking a 6.8% rail mode share (Page 211) is far too modest. While "of total transportation trips made on all modes, 30 percent of the growth will be made on rail instead of an automobile" (Page 193) is a more aggressive projection, TRAC believes that the 70% of the growth that continues to depend on the automobile will crash the system.

At the same time that the Plan underestimates the need for rail service to serve growth, we believe it to be too optimistic as regards the effect of rail service on VMT. The following quotes from the Plan fail to take into consideration the Triple Convergence first described by Anthony Downs in *Stuck in Traffic* (1992) (See Attachment #6 for a discussion):

> This plan also considers potential highway and bridge maintenance cost reductions from reduced truck and automobile travel. (Page 117)

> It decreases direct and indirect health care costs for the State and individuals as a result of improved safety associated with reduced VMTs (from mode shift) (Page 117)
>
> ... will help to lower VMTs, thereby reducing total household transportation costs and increasing disposable income. (Page 117)
>
> As the State's passenger rail system grows, the resulting reduction in VMTs and reduced rate of highway expansion will result in air quality benefits (Page 116)
>
> Reducing the number of auto trips will reduce pressure on—and improve the performance of—the State's highway network, while decreasing VMTs and GHG emissions (Page 116)
>
> Corridor-based planning to be undertaken by Caltrans will place increased emphasis on rail and transit as a competitive solution for relieving congestion on state highways and reducing greenhouse gas emissions. (Page 31)
>
> Rail, therefore, is an effective mechanism for congestion relief on highways ... (Page 157)

We wish these statements were true, but they are not, because congestion maintains an equilibrium level, despite added transit capacity. TRAC believes the future to be one of miserable congestion. Unless road pricing is implemented, mobility will be available only to those that choose public transit. The key distinction needed here is that rail is an effective mechanism to provide individuals with relief from congestion, because it offers them an alternative to driving. But this can only happen if Caltrans stops wasting its resources on the fruitless attempt to "relieve congestion" by widening highways, and instead concentrates its efforts on cost-effective rail projects.

Land Use and Station Area Planning

The text is in error when it asserts, "Robust station area planning is an important land use and development trend that can help solve the first mile/last mile challenge..." (Page 25) The "first mile/last mile challenge" is not a transportation problem--it is a land use problem. A well-designed station area set in a dense transit network doesn't have a first mile/last mile challenge, because everyone can walk, bike or take transit to the station. It is only suburbanites that have a first/last mile problem.

The biggest challenge of station area planning is overcoming California's bias against density. Jurisdictions squander the public investment in transit infrastructure when they are built out with too low a density. (South San Francisco approved a big box store adjacent to a heavy rail BART station.) The State could prevent this by setting minimum densities for station sites receiving State funding.

TRAC disagrees that:

> a modern, statewide rail network, with HSR as its backbone, will catalyze more compact land use patterns, the combined effect of which will be even greater reductions in GHG emissions. (Page 25)

A mere catalyst cannot reverse the 70 years of momentum behind sprawl. Poor land use decisions with disastrous cumulative impacts will continue unless there is explicit State legislation mandating change. Current RTPs project no mode shift occurring between now and 2040, indicating that agencies do not expect land use patterns to shift from current sprawl-based patterns towards TOD.

TRAC applauds Caltrans' call for "avoiding sprawl-inducing impacts of new roadway construction or expansion of state highways." (Page 115) We urge that the State's transportation funding, especially SB 1's Solutions for Congested Corridors Program, be directed to rail rather than highway projects.

In keeping with that last quotation, the State needs to develop a policy framework to make sure that station area parking lots and structured parking do not induce more sprawl. The history of BART is the history of suburban extensions with huge station area parking lots. The resultant sprawl and highway congestion was both totally predictable and avoidable.

CTP 2040 is Inadequate as a Policy Source

Because of decisions made by Caltrans senior management, CTP 2040 does not provide an adequate context for this Rail Plan. While the following statement is correct about the Draft CTP 2040 Plan, the adopted plan did not have these features:

> In response to State legislation and executive orders, CTP 2040 includes an innovative approach to address climate change and GHG emissions. Three scenarios were evaluated to illustrate the potential effectiveness of State policies, programs, and major investments on reaching GHG emissions goals. In addition to GHG reductions, each scenario was evaluated based on multimodal system performance and economic impacts. Scenario analyses informed policy recommendations, which were refined through extensive outreach and coordination with stakeholders... (Page 35)

In violation of SB 391, the climate-related policy recommendations were removed before CTP 2040 was adopted, and the scenarios were demoted to a mere "theoretical exercise."

> Modeling of the transportation scenarios was a theoretical exercise designed to test one specific path to reach GHG reduction targets set by AB 32 and Governor Executive

> Orders. There are limitations to the models and all conclusions and findings should be read with this caveat. These are not specific policy recommendations. (Final CTP 2040, p. 17, emphasis added.)

Because of these modifications, since the Plan "support[s] the goals and policies of the CTP 2040" (Page 101), that means that the Plan will not do enough to reduce GHG emissions to a level that meets State climate change targets. The Plan thus seriously understates the level of investment needed for rail projects and the significance of shifting of funds from highway to rail.

We do not find the goals and policies of the CTP to provide an adequately focused set of priorities capable of guiding decision-making. A much more concise formulation is needed. We propose: "Provide an alternative travel mode feasible for large numbers of Californians." We suggest that the remainder of Chapter 3 not be categorized as goals and policies. These points are the details on how to accomplish that goal.

Accessibility

Goal 1 (Page 101) is entirely silent on accessibility, despite its title "Improve Multimodal Mobility and Accessibility for all People". This is especially curious after stating "A sustainable system must be accessible to all." (Page 97) This concern is heightened by Caltrans' recent approval of a contract for intercity rail cars that are far less accessible than current cars. TRAC proposes that the State work towards a universal platform height of 24", and not follow the example of the Northeast Corridor, which has very-expensive-to-implement 48" platforms. (See Attachment #7, "Caltrans' Choice of Unsuitable Car Design Will Hamper Rail.") Implementing a program like that will require rule modernization, to allow level boarding without the unnecessary expense of gauntlet tracks. (See Attachment #8, "Obsolete Rules Obstruct Level Boarding.")

High-Speed Rail

TRAC agrees that HSR is an essential part of the State's future. However, we see the HSR project currently underway as having been so distorted by its politicization that we are confident that it will run out of money and fail. The 2016 Business Plan tacitly admits that CHSRA has no way to fund a rail connection to Southern California.

There are now serious doubts as to whether HSR even can build out its plans to San Jose. The need to avoid the San Luis Reservoir has forced the lengthening of the tunnel under the Pacheco Pass. This threatens to increase the cost far beyond the amount the 2016 Business Plan optimistically estimated as available to the project.

TRAC sees the 2040 Long-Term Vision's extensive references to HSR service (Pages 144-154) as missing links in the Plan, because we believe the current HSR project is likely to run out of money and be left as a stranded asset. That would mean that the building blocks described in Section 4 of the Plan would remain disconnected from each other. In order to have a functioning network to tie those individual projects together, it is clear the State needs a fallback plan--and does not have one. TRAC has been writing on this subject for decades, and would be happy to share our ideas with Caltrans.

Electrification

The development of zero-emissions rail transport has reached a point of decision: overhead catenary, the historic method, has become extraordinarily expensive at the same time that trains powered by batteries and hydrogen fuel cells are becoming commercially available. We are pleased that the Plan demonstrates an understanding of the issue:

> Electrification for some parts of the statewide rail network will mean traditional catenary-based systems. For other services, this will mean other zero or near-zero emissions technologies. (Page 105)

We note, however, that contrary to this even-handedness, the Plan consistently proposes catenary projects:

> Planning for a new electrified alignment between Richmond and the Solano County hub, including selection of an alignment and determination of service needs for express and local service on the corridor. (Page 138)
>
> Study to determine the long-term mix of express and local services that can be supported in the corridor, including the extent of electrification that is possible... Decisions about electrifying the corridor will influence service patterns and which corridor sections may need peak-only additional service.(Page 141)
>
> ... using electrified east-west express rail corridors. (Page 143)
>
> ...to extend conventional electrified rail services... An electrified conventional rail tube also offers the opportunity for additional regional electric service for regional trips ... (Page 146)

TRAC recommends that rail planning and financing focus on the electrification of vehicle prime movers rather than corridors. With the right vehicle technology and renewable sources of electricity and/or hydrogen, the constraints clearly evident in the quotes above would disappear, freeing up service planning. We are heartened by the recent order by a German transit agency for hydrogen-powered fuel cell multiple units (See Attachment #13). Britain is now testing battery powered trains. (See Attachment #14, "Battery-powered train carries first passengers.") It is clear this path offers a far more cost-effective method of achieving zero-emissions passenger trains than catenary electrification.

III. Comments on the Plan's Specifics

Comments on Specific Improvement Plans

Coachella Valley (Page 64): See Attachment #9, "Coachella Valley Trains Could Be Winners--With Better Plan."

TRAC is very leery of the following proposal, due to its likely $30+ billion cost:

> In the Northern California mega-region, for example, building a second Transbay tube to accommodate conventional rail will expand the mega-regional travel options, while further decreasing congestion on parallel corridors. (Page 114)

This is why we strongly favor the rehabilitation of the Dumbarton Rail Bridge in conjunction with a much faster ACE corridor: Being able to bring passengers from Southern Alameda County and San Joaquin County directly into San Francisco would obviate the need for a new tube for many years. This approach should be investigated for the Final Rail Plan, because it would be relatively quick to implement.

Enhanced service in the Altamont corridor is one of TRAC's highest priorities. Attachment #2, "TRAC'S Integration Plan For the San Joaquins and Altamont Commuter Express" supports the following Plan elements:

> Plan for phased growth in east-west service across the Altamont Pass to hourly off-peak and half-hourly peak service, enabling connectivity to regional transit and statewide rail networks, including connectivity in the Tri-Valley. (Page 129)
>
> Open an East Bay hub station near Newark, Hayward, or Fremont to allow connections between north-south service between Oakland and San Jose, and east-west services between the Stockton Area and San Jose and a regional Dumbarton Bay Crossing. (Page 139)
>
> Half-hourly peak and hourly off-peak bus or rail service in the Dumbarton Corridor (based on the results of the 2022 study), with connections in the East Bay to Altamont Corridor, Oakland to San Jose rail, and BART services. (Page 139)

TRAC sees no point to including express buses in a study of Dumbarton Rail Bridge. (Page 132) Note that TRAC 's integration plan proposes the rerouting of the San Joaquin, so that it would no longer stop at Martinez, making Martinez-based projects less necessary.

Because we see the Altamont Corridor as the express corridor between Sacramento and San Francisco, we suggest the Capitol Corridor should be seen as a local service, at least north of Richmond. To avoid duplication of effort, we oppose the following:

> Planning for a new electrified alignment between Richmond and the Solano County hub, including selection of an alignment and determination of service needs for express and local service on the corridor. (Page 138)

TRAC believes that a more appropriate way to serve Cloverdale and the lightly populated corridor between Healdsburg to Willets would be by lower-cost lightweight DMUs, at a lower frequency than the SMART system:

> Plan for completion of SMART to Cloverdale by 2027. Evaluate expansion of rail service from San Rafael, Sonoma, and Napa Counties to Solano County, considering rail service primarily on existing rail alignments with potential connections to the statewide network at Fairfield-Suisun or near Vallejo. (Page 130)

In TRAC's plan, the corridor from Novato to Sacramento would be served by similar lightweight DMUs, which are compatible with the platforms of the Capitol Corridor. (See Attachment #10, "A Vision for Passenger Rail in the North Bay and Sacramento Region.")

TRAC strongly supports the Caltrain Downtown Extension:

> Determine final alignment of Downtown Extension to Transbay Terminal and begin construction, allowing future high-speed and regional services to serve Transbay Terminal. (Page 131)

The Mayor of San Francisco has impeded the progress of the Downtown Extension. (See Attachment #11, "SF Mayor's Railyards Study Sidetracks DTX.")

TRAC is very skeptical of the High Desert Corridor proposal. (Page 132) We see little benefit from this project to anyone other than the project sponsors, who have been optioning and buying up land along the corridor. This should be a private sector project, with no public funds allocated.

With TRAC's proposed integration plan (Attachment #2), because ACE would travel faster than BART direct to the Silicon Valley, we see no need for this Tri-Valley hub to connect BART and ACE:

> Establishment of a Tri-Valley hub to connect BART, Altamont Corridor services, and Integrated Express Bus service to Solano County on the I-680 Corridor (Page 139)

An enhanced ACE corridor can meet BART at a low-cost pedestrian transfer station where their tracks cross, at Shinn Street in Fremont.

One of TRAC's highest priorities is:

> Run-through service at Los Angeles Union Station as part of the LINK-US program, allowing for the restructuring of intercity and regional services passing through Los Angeles Union Station... (Page 142)

We have commented on Metro's fascination with retail development at Union Station, to the detriment of progress on the run-through tracks. (See Attachment #12, "Metro: Transit Provider or Developer?")

TRAC sees the following as highly unlikely:

> ... future long-distance travel between San Diego and the rest of the state will be served by the State's significant investment in HSR service through the Inland Empire. (Page 143)

There are no indications that HSR can secure funding to even reach Southern California, much less build the roundabout route to San Diego via the Inland Empire. Because "track segments can be designed to meet pre-determined travel times" (Page 102), full HSR may not be needed in this corridor.

What the State can afford to do is improve speeds in the LOSSAN Corridor. The first priority should be a tunnel to avoid the lengthy detour through Rose Canyon, near San Diego. In addition, other projects are needed to bypass San Clemente, and make travel fast and safe through beach towns.

TRAC recommends extending the Green Line from Norwalk to the Pacific Surfliners.

Miscellaneous Points

TRAC is disappointed that passenger rail advocates RailPAC and TRAC were not consulted in the preparation of this Plan. (Page 225)

The discussion on Page 47 is lacking. Intercity needs to be understood as distinctly different from commute (called "regional" in the Plan) services, requiring a non-local level of governance. California doesn't have any true intercity service now. (See Attachment #1, "Intercity Passenger Trains are not Commuter Trains.") Note its recommendations for governance: intercity service requires a state-level focus, to keep it from devolving into commute service.

The seemingly innocuous statement "The integrated network will not include duplicate or overlapping investments" (Page 106) should be applied by the State in evaluating locally politically popular project proposals. BART to San Jose, for example, duplicates the service provided by ACE, and should not receive State funding.

We nominate as additional Plan goals: "making the existing system more cost-effective to operate" (Page 3) and "foster the use of cleaner and quieter locomotives that will make railroads better neighbors." (Page 162)

One improvement we suggest is the repeal of the law that restricts Amtrak buses to only those passengers connecting to rail travel. For a low marginal cost, a better network would result from opening the use of these buses to all passengers.

Factual Errors

"HSR in California will revolutionize the efficient movement of large volumes of people at fast speeds over long distances at an anticipated lower operations cost than other rail and transit services in the state." (Page 7) This lower operations cost seems highly unlikely and is not documented. Experience with CHSRA demonstrates that everything about this HSR project is expensive.

"... all new development must happen in the existing urban footprint." (Page 25) According to MTC's Plan Bay Area DEIR (p. 2.3-35), "Together, land use and transportation projects in the proposed Plan have the potential to convert agricultural lands and open space to urban uses."

"Passenger rail services often provide cost- and time-competitive alternatives to auto travel..." (Page 27) Rail in California is disappointingly slow, in general. Our Intercity paper (Attachment #1) disputes the claim that intercity services in California are time-competitive with the automobile.

"Caltrain, in particular, already operates at or near capacity during peak period." (Page 93) This corridor saw shorter headways in 1968 than are used now, even though the signaling then was primitive compared to today. Current congestion is a scheduling problem, not a capacity problem.

Please fix the following seemingly self-cancelling sentence construction: "Regional services operate with auto-competitive travel times, which may be faster than auto travel in rush-hour periods." (Page 102)

"The rail system of the future will also be significantly less expensive on a unit basis than today's rail services, lowering the overall household and business expenditures on transportation, and further enhancing California's economy." (Page 110) Given the explosion of capital costs, this assertion seems especially far-fetched. Please provide backup documentation.

Editorial Issues

It would be good to note on Page 41 that other agencies are involved with rail safety, and refer to Section 2.1.6.

The following text on Page 68 is both obsolete and duplicative, since SMART has commenced service: "that will initially run from Santa Rosa to San Rafael. Rail service on the initial segment will commence in 2017." "SMART is scheduled to launch

passenger service in late-spring 2017." In addition, the travel time is no longer "estimated." The schedule calls for the time stated.

It would be good to mention on Page 102 and elsewhere that "regional services" is another term for "commuter rail," a term that is much more widely used.

On Page 103, the word "to" is missing in the phrase "serve increase" in the first bullet.

Table 5.3 on Page 166 contains a duplicate entry: "Address community impacts..."

"The scenario entailed rail moving a full 75 percent of the State's top three crops currently moved by rail... (Page 208) "Truck" was apparently intended.

Conclusion

Thank you for this opportunity to comment on the draft 2018 State Rail Plan. TRAC would be pleased to speak with Caltrans staff about our comments and our proposals.

Sincerely,

/s/ DAVID SCHONBRUNN

David Schonbrunn,
Vice-President for Policy

Attachments

1. Intercity Passenger Trains Are Not Commuter Trains--Implications for Public Policy, TRAC, 2017
2. TRAC'S Integration Plan For the San Joaquins and Altamont Commuter Express, TRAC, *California Rail News*, May-September 2017
3. How Politics and Bad Decisions Starved New York's Subways; New York Times, 11/20/2017 (The first three pages of a 22 page article are excerpted.)
4. "Electric Fast Freight" in California? Moving Short-Distance Truck Freight to Rail; TRAC, *California Rail News*, May-September 2017
5. Congestion Pricing Was Unpopular in Stockholm—Until People Saw It in Action, Streetsblog New York City, November 28, 2017
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ATTACHMENTS

ATTACHMENT 1

Intercity Passenger Trains Are Not Commuter Trains --Implications for Public Policy

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Introduction

Three state-supported agencies provide intercity passenger rail service in corridors connecting metropolitan regions in California. Other California agencies operate intra-metropolitan passenger train services known as commuter trains. Some commuter trains operate on the same tracks as state-supported intercity passenger rail trains. Under the recent devolution of power from the state to JPAs, these intercity services are managed by commuter rail agencies. This intermingling results in confusion as to the respective market functions of these two distinct types of service. None of the state-supported intercity rail corridor agencies has adopted service design standards to differentiate themselves from commuter services.

This paper addresses whether the state-supported intercity passenger rail services do (or should) serve different markets than commuter trains. It first examines definitions found in the literature for intercity passenger rail service and commuter service. It then explores examples of those service patterns still found today. Finally, it investigates the three state-sponsored intercity services and compares them to a commuter service. These three sections lead to recommendations on how the two types of service should evolve in California, to enhance their usefulness to the traveling public.

Definitions of Commuter and Intercity Rail Service

The authorizing Amtrak legislation distinguishes between commuter and intercity passenger service: ". . . commuter rail passenger transportation means short-haul rail passenger transportation in metropolitan and suburban areas usually having reduced fare, multiple-ride, and commuter tickets and morning and evening peak period operations. Intercity rail passenger transportation means rail passenger transportation, except commuter rail passenger transportation."[1] This failure to affirmatively define what intercity services are has led to decades of confusion.

There are other definitions for shorter-distance trains services that distinguish between commuter and intercity services. Wikipedia defines commuter rail as, ". . . a passenger rail transport service that primarily operates between a city centre, and the middle to outer suburbs beyond 15 km (10 miles) and commuter towns or other locations that draw large numbers of commuters—people who travel on a daily basis."[2] It defines a commuter train ". . . as a passenger train that is ridden primarily by passengers who travel regularly from one place to another."[3]

In contrast, Wikipedia defines intercity rail services "as express passenger train services that cover longer distances than commuter or regional trains. There is no precise definition of inter-city rail; its meaning may vary from country to country. Most broadly, it can include any rail services that are neither short-distance commuter rail trains within one city area, nor slow regional rail trains calling at all stations and covering local journeys only. Most typically, an inter-city train is an express train with limited stops and comfortable carriages to serve long-distance travel. . . . Ideally, the average speed of inter-city rail service would be faster than 100 km/h (62 mph) in order to be competitive with car, bus and other methods of transport."[4]

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The term "average speed" used in the preceding definitions requires further explication. Travelers are most concerned about the time it takes to get from their beginning station to their terminating station. This is expressed as the average speed traveled between the two stations. It includes the time the train is stopped at intermediate stations ("dwell time"). Often when discussing high-speed rail, authors will refer to the highest speed reached by a train over the length of its run. There is a significant difference in most if not all rail passenger corridors between the speed of the fastest segment of track and the average speed experienced by passengers. The segment of the Pacific Surfliner corridor between Los Angeles and San Diego, for example, has several segments of 90 mph track, and some observers refer to the corridor as a 90 mph corridor because of this higher speed track. However, the average speed of the corridor is only 44 mph. This slow average speed is a key determinant influencing passenger choice of a travel mode.

The Northeast Corridor: Clearly Distinct Intercity and Commuter Services

There is only one intercity passenger corridor in the United States that meets Wikipedia's definition of an intercity passenger rail corridor: the Northeast Corridor. Two to four well-maintained tracks stretch 454 miles between Boston, New York, Philadelphia, Baltimore, and Washington, D.C. The existing infrastructure and the passenger rail services using it are descendants of services and infrastructure that private railroads developed in the early 20th century in response to a large travel market. That is, the intercity corridor service and short-distance commuter services we see in the Northeast Corridor today are the descendants of services shaped by profit-seeking, rather than by political considerations.

What developed closely follows the Wikipedia definition of commuter and corridor service. Because both northern and southern California are taking on population and employment densities similar to those of the Northeast Corridor, it is instructive to examine the service patterns in the Northeast Corridor that come down to us from market-based beginnings well over a century ago. The Northeast Corridor offers California the best demand-based model in the United States for passenger train service development.

Amtrak offers two service categories within the NE Corridor, each of which can be characterized as intercity corridor service that meets, or nearly meets, Wikipedia's definition of intercity passenger corridor service. Amtrak markets one as the Acela Express. As shown in Table 1, nine daily Acela Express trains cover the 454 miles between Boston and Washington, D.C. at an average speed of 65 mph. The Value Fare[5] is $0.50 per mile. Acela average speeds, frequencies, and Value Fares are considerably higher on the southern half of the corridor between New York and Washington DC: 78 mph, 15 daily frequencies, and $0.80 per mile. The overall load factor for all Acela trains is 68%.[6]

Table 1. Summary Northeast Corridor Intercity Rail Characteristics

Corridor Segment	Distance (miles)	Southbound Weekday Trains	Average Speed (mph)	Value Fare, One-Way (dollars per mile)
Boston - Washington DC				
Acela Express	454	9	67	$0.50
Northeast Regional	454	7	57	$0.32
Boston - New York				
Acela Express	229	10	64	$0.58
Northeast Regional	229	9	54	$0.34

New York - Washington DC				
Acela Express	225	16	78	$0.82
Northeast Regional	225	22	66	$0.41

Amtrak brands the second category as Northeast Regional Service, whose trains stop somewhat more frequently and therefore are somewhat slower and less expensive to ride than Acela Express trains. Ten daily Northeast Regional trains run each way over the 454 miles between Boston and Washington, DC at an average speed of 57 mph, charging a Value Fare of $0.32 per mile. The fare is about double what consumers are willing to pay for the longest corridor services in California. Northeast Regional Trains operate even faster between New York and Washington DC. Fourteen daily NE Regional trains cover the 225 miles in each direction at an average speed of 66 mph, charging an average Value Fare of $0.42 per mile. The average load factor for all Northeast Regional Trains is 48%.[7]

Various state and local agencies operate commuter trains over most of the length of the corridor. Table 2 illustrates how commuter trains and the two categories of Amtrak's intercity passenger corridor services fit together on four stretches of the corridor. Two stretches are north of New York on the slower part of the corridor, while two are south of New York.

Table 2. Comparisons Between Amtrak and Commuter Operations on Four Segments of the NE Corridor

NE Corridor Segment	Distance (miles)	Weekday southbound departures	Average Speed (mph)	Fare per mile
Old Saybrook CT to New Haven Union Station CT	32.8			
Acela Express (no Acela Expresses stop at Old Saybrook)		0	NA	NA
NE Regional Corridor Trains		6	58	$0.49
Shore Line East (CT DOT) commuter trains		17	47	$0.12
New Haven Union Station CT to New York [8]	72.3			
Acela Express		9	47	$1.07
NE Regional Corridor Trains		11	43	$0.58
Metro North (New York MTA) commuter trains[9]		40	38	$0.17
NY Penn Station to Trenton NJ	58.1			
Acela Express (only 2 trains stop at Trenton)		2	75	$1.33
NE Regional Corridor Trains[10]		31	64	$0.84
New Jersey Transit commuter trains[11]		53	39	$0.21
Trenton to Philadelphia 30th Street	30.9			
Acela Express (only 2 stop at Trenton)		2	73	$1.78
NE Regional Corridor Trains		28	64	$1.06
SEPTA commuter trains[12]		28	38	$0.15

Note: The fares shown for NE Regional and Acela Express are Value Fares; commuter fares are for one-way rides using a monthly pass.

On all four stretches of the corridor both categories of intercity corridor trains operate at higher speeds than commuter trains and charge much higher fares, as well. The speed differential is greater

south of New York than it is north of New York, and perhaps because of that, the fare differential is higher south of New York, as well. In these Northeast Corridor cases, commuter fares are $0.12 to $0.21 per mile when using a monthly pass. These Northeast Corridor commuter fares are somewhat higher than those in California. The several commuter services summarized in Table 3 for California are in the range of $0.10 to $0.13 per mile for monthly pass holders.

Table 2 shows the relatively slow speeds of both Acela Expresses and Northeast Regional train service between New Haven and New York compared to their overall average speeds for all of the corridor as shown in Table 1. Speeds on this stretch are almost as slow as those in California. Because Amtrak owns and operates most of the corridor, it is curious that these slow speeds occur on one of only two parts of the corridor where Amtrak is a tenant--with no control over scheduling and dispatching. Hearsay suggests that this lack of control over dispatching is responsible for its inferior performance there. If further research demonstrates that this is true, institutional structure will need to be considered an important variable in California rail corridor development affecting the effectiveness of policy and service initiatives to lure choice passengers on board.

Another important point is that most freight traffic has been diverted to freight main lines that parallel the NE Corridor. The small amount of freight traffic that still remains on the Corridor receives a lower dispatch priority than corridor and commuter passenger trains. Improvement of California's corridor and commuter services will require more separation of freight and passenger service.

How California Intercity Corridor and Commuter Train Services Fit the Definitions

California's population and employment growth is yielding travel demand and congestion of similar magnitudes to those found in the Northeast, but California's railroad heritage is far different. Private railroad infrastructure grew in California to accommodate the freight and passenger traffic of a much smaller population, albeit a rapidly-growing one. Passenger and freight services were relatively infrequent, and the state's main intercity rail routes mostly were low-capacity, single-track lines. Over time, growing freight traffic replaced declining passenger traffic on many routes. Private rail companies invested in those routes to operate longer and heavier freight trains, with no provision for passenger trains, except to a certain extent on the routes between San Francisco and San Jose and Oakland and Sacramento.

Designers of California's more recent expansion of state-supported passenger services attempted to shoehorn those services into an intercity rail infrastructure suited to the state's much smaller cities of a century ago. Spending hundreds of millions of dollars to add more capacity in the forms of passing sidings and crossovers could not change that fundamental compromise. The significant consequences of that compromise are detailed in comparisons between the California services and the demand-based services that evolved in the Northeast Corridor. Achieving California services as effective as those in the Northeast would require substantial additional rail investment, to increase speeds. While the price tag would be high, it would only be a small fraction of the cost of the state's current High Speed Rail project.

Table 3 summarizes service characteristics of the three state corridors as well as one commuter corridor. The three state-supported intercity passenger rail corridors are the Pacific Surfliner Corridor, the San Joaquin Corridor, and the Capitol Corridor. The commuter corridor is Caltrain. Comparing the characteristics of these services to the definitions suggests that they are neither commuter nor intercity market-oriented.

Pacific Surfliner

The Pacific Surfliner Corridor, governed by the LOSSAN JPA, extends from San Diego to Los Angeles, Santa Barbara, and San Luis Obispo. From the north end, the LOSSAN JPA leases track space from the Union Pacific Railroad to operate its trains from San Luis Obispo to Moorpark (about half way

between Santa Barbara and Los Angeles). From Moorpark to Los Angeles, the LOSSAN JPA leases track space from the Southern California Regional Rail Authority. For the next 25 miles from Los Angeles to Fullerton, the LOSAN JPA uses the tracks of the private BNSF Railway. From Fullerton to Oceanside in northern San Diego County, the LOSSAN JPA again uses tracks owned by the Southern California Regional Rail Authority. To get its trains from Oceanside to San Diego, the LOSSAN JPA must deal with yet another track owner, the North County Transit District.

Over most of this corridor freight traffic is light. There is heavy freight volume, however, between Los Angeles and Fullerton, about 25 miles. This stretch is part of the BNSF main line entering Los Angeles from the East. This short segment has been expanded from two to three main tracks with frequent cross overs to accommodate both freight and passenger service.

All but one of the state-supported passenger trains operate only in the heavily-populated territory east of Santa Barbara. Table 3 depicts the distribution of service east of Santa Barbara and also shows some (but not all) of the locally funded commuter trains there.

The most frequent state-supported service (12 daily round trips) runs 128 miles between San Diego and Los Angeles at an average speed of 44 mph. Five of these trains continue on to Santa Barbara, another 103 miles further west. They average 45 mph for the entire 231-mile run from San Diego to Santa Barbara. These speeds are below those defined by Wikipedia as constituting viable intercity corridor passenger service.

Table 3 also shows Value Fares, expressed as the fare per mile. State-supported fares reflect Amtrak practice in setting fares to obtain maximum revenue possible out of each market. That is, they reflect willingness to pay on the part of riders, so higher fares reflect higher demand. The fare for the 128-mile trip between San Diego and Los Angeles is $0.29 per mile, but the fare for the 231-mile trip between San Diego and Santa Barbara is only $0.18 per mile. This difference in fares suggests that

Table 3. California Rail Characteristics

Corridor	Distance (miles)	Weekday southbound departures	Stations (includes end point stations)	Avg. Speed (mph)	Fare per mile
Pacific Surfliner Corridor					
Santa Barbara -San Diego	231	5		45	$0.18
Santa Barbara - Los Angeles	103	5		46	$0.30
Los Angeles - San Diego	128	12	9 (plus 6)	44	$0.29
Los Angeles - Oceanside (Surfliner)[13]	87	12	7 (plus 1)	46	$0.32
Los Angeles - Oceanside (Metrolink)[14]	87	5	14	42	$0.13
Oceanside - San Diego (Surfliner)	41	14	3 (plus 5)	40	$0.37
Oceanside - San Diego (Coaster)	41	11	8	39	$0.10
San Joaquin Corridor					
Oakland Jack London - Bakersfield	315	5	14	51	$0.15
San Francisco - Los Angeles[15]	418	5	17	46	$0.14
Capitol Corridor					
Sacramento - Oakland Jack London	90	15	7	47	$0.32
Sacramento - San Jose	133	7	14	42	$0.30
Oakland Jack London - San Jose	43	7	7	33	$0.40

Caltrain Commuter Service[16]					
San Jose - San Francisco (local)[17]	47	14	22	30	$0.13
San Jose - San Francisco (limited stop)[18]	47	21	11 to 19	34	$0.13
San Jose - San Francisco (Baby Bullet)[19]	47	11	7	44	$0.13

average speeds of about 45 mph are just too slow for passengers travelling longer distances.

If Santa Barbara's smaller population than San Diego County explained the lower fare-per-mile between San Diego and Santa Barbara, we also would expect to see the lower fare-per-mile prevailing between Los Angeles and Santa Barbara. However, the Value fare for the 103-mile trip between Los Angeles and Santa Barbara is $0.30 per mile, almost exactly the fare-per-mile (and therefore demand) for a 128-mile trip from Los Angeles to San Diego. Population clearly is not a determinant here.

While the Pacific Surfliner trains are too slow to be attractive to the longer distance intercity travelers in the corridor, the trains also stop too infrequently to be attractive to many commuters, even though the JPA sells 10-ride tickets and monthly passes (which are less than half the per-mile cost of single tickets).

County and locally-based transit agencies in Southern California have formed two joint powers agencies to operate commuter trains on some of the tracks used by the Surfliners. Commuter trains run by the Southern California Regional Rail Authority under the moniker of Metrolink operate additional commuter trains over the corridor tracks from Moorpark (48 miles west of Los Angeles and 56 miles east of Santa Barbara) to Los Angeles and on to Oceanside. Additional commuter trains operated by the North County Transit District under the moniker of the Coaster run between Oceanside and San Diego. Table 3 shows characteristics of the Oceanside to Los Angeles leg of the Metrolink commuter service.

The table shows that 12 state-supported intercity corridor trains connect Oceanside with Los Angeles at an average speed of 46 miles per hour making 7+ stops and charging a fare of $0.32 per mile. Running on the same tracks between Los Angeles and Oceanside are an additional 5 transit-supported commuter trains. They stop more often (14 stops including end points), but because the commuter trains dwell only a few seconds at each stop and accelerate and decelerate faster than the more-cumbersome corridor trains, they are, at 42 mph average speed, almost as fast. Their fare is much lower, however---only $0.10 - $0.13 per mile with a monthly pass.

These service patterns do not fit the needs of either intercity passengers or commuters. Intercity service is too slow for its market, and commuter service is too infrequent for its market. The fact that the transit-oriented commuter agencies own most of the corridor and have little concern for the intercity market makes matters worse. One consequence of this ownership pattern is that the commuter agencies view the corridor trains as a cheap way to make up for the infrequent commuter service. They pressured the state-operated trains to make additional station stops and to accept commuter fares. The overall occupancy rate of San Diego corridor trains was about 39% in FY 2012, with an upward patronage trend.[20]

Complaints found on the web about Los Angeles to San Diego intercity passenger rail service are directed at its slow speed, its unreliability, and the practice of making the corridor trains stop at all of the commuter stops if a commuter train fails to make its run. This is particularly aggravating to corridor passengers, who pay three times as much as the one-way monthly pass cost of commuters.

Much could be done to attract ridership, including institutional reform, infrastructure improvements, lightweight, high-acceleration DMU trainsets, and a new service design. Placing the entire route between Moorpark and San Diego under the control of LOSSAN (perhaps with state oversight), with both Metrolink and the Coaster as tenants, would go a long way to improving the speed and reliability of the corridor trains. The 25-miles of route between Los Angeles and Fullerton require two dedicated passenger tracks alongside two BNSF freight tracks. The entire line from Santa Barbara to San Diego requires double-tracking.

Eliminating the long detour through Rose Canyon, near San Diego, by tunneling, would be a major improvement. There would be a station in the tunnel immediately beneath San Diego's largest and most vibrant employment center and one of its largest shopping districts in the region. The station also would serve the University of California San Diego's campus and related medical complexes, both a short hop away via light rail service. Finding a faster route through (or under) San Clemente would also greatly speed up the service. Shedding many of the low-patronage intermediate stations better served by Coaster and Metrolink commuter trains would save even more time and return the Surfliner to the way Santa Fe Railway operated it in its heyday. Complementary high-speed corridor trains and slower-speed commuter trains would together provide an attractive service that many drivers on the adjacent congested freeway would find attractive.

San Joaquin Corridor

The presentation of the San Joaquin Corridor shown in Table 3 tells a somewhat different but not inconsistent story. The service is a tenant to two private railroads for its entire 315-mile distance from Oakland Jack London Square station to Bakersfield. Although no commuter trains share its tracks, the management of the ACE commuter service runs the service. There are five train departures from Oakland Jack London to Bakersfield, where passengers may transfer to dedicated buses to continue their trip to Los Angeles Union Station and other points in Southern California. At 51 mph the average speed between Jack London Square and Bakersfield is higher than that for other California corridor services, but it still is much slower than driving, which motivates charging a low fare of $0.15 per mile. One possible explanation is that 51 mph is just too slow for most longer-distance travelers, requiring an ultra-low fare to lure otherwise-reluctant passengers onto the train.

Another possibility is that because of its small population (roughly 350,000 within the city), Bakersfield has low patronage-generating potential. Most passengers on trains in Bakersfield are actually connecting by bus to points in Southern California.

Passengers traveling between downtown San Francisco and Los Angeles have dedicated bus connections at either end of the San Joaquin rail Corridor. Passengers begin their trip on a dedicated bus that takes them across the bay to Emeryville. They then have a 310-mile train ride to Bakersfield punctuated by 13 intermediate stops, after which they transfer to another bus for the remaining 100-mile ride to Los Angeles Union Station. Even though Los Angeles has high patronage potential, this travel pattern does not attract proportionate ridership.

The average overall speed from San Francisco to Los Angeles is 48 miles per hour, with an average Value Fare of only $0.14 per mile--even lower than it is to Bakersfield. Undoubtedly, the time and inconvenience of the bus-rail-bus trip is a factor in low demand between San Francisco and Los Angeles.

Competition may be another culprit responsible for the low fares. The San Joaquins suffer from competition by faster, transfer-free bus service between San Francisco and Oakland and Los Angeles Union Station. MegaBus offers about the same number of daily departures as does the San Joaquin Corridor, but the bus service departures are more evenly spaced around the clock, and MegaBus passengers get a through-ride without the need to transfer twice. MegaBus travel times range from 7 hours 30 minutes to 8 hours and 10 minutes compared to somewhat more than 9 hours for the San Joaquin bus/rail/bus service. MegaBus fares average about $23 for a reserved seat (including booking charge)[21] compared to San Joaquin Value fares of $59, also for reserved seats.

In FY 2012, the average San Joaquin train load factor was about 35%, and it has decreased since then. For the past three years, train patronage has been falling steadily, even after an additional train frequency was added in Fall 2016.[22] To be viable, a rail alternative requires considerably faster, direct train service linking Southern and Northern California. Wikipedia's 62 mph definition as the lower bound for competitive intercity passenger rail corridor service may be spot-on. What this corridor most

needs is a passenger-only track, so that trains can travel at 110 mph between the well-spaced stations. That would eliminate scheduling conflicts with freight trains.

Tremendous synergies would result if the San Joaquin became an express service, paired with ACE local service, sharing a new passenger rail line across the Altamont Corridor. Discontinuing San Joaquin service to five or six of the existing low-patronage stations would result in much faster average speeds and higher patronage. The ponderous double-deck trainsets should be replaced with lightweight, high-acceleration, high-speed DMU trainsets of European design. Replacement local service might also be provided much more economically by DMUs. Timed transfers between locals and expresses would facilitate longer-distance travel from lower-patronage stations (for those willing to pay for ticket upgrades). In the longer run, a new, direct route via Tejon Pass is needed from Bakersfield to the San Fernando Valley. Such an infrastructure investment would connect Southern and Northern California corridor rail services, dramatically increasing their patronage as well as patronage on the LOSSAN Corridor, to which it would connect in Los Angeles.

Capitol Corridor

Capitol Corridor train service runs from Sacramento to San Jose, 133 miles to the south, although one round trip begins and terminates at Auburn, about 35 miles northeast of Sacramento. Table 3 depicts service on that part of the corridor between Sacramento and San Jose.

The Capitol Corridor is a tenant of the Union Pacific Railroad over all but the last 3 miles of the distance between Sacramento and San Jose. (To access the San Jose Diridon Station from Santa Clara, Capitol Corridor trains use Caltrain's tracks, owned by the Peninsula Corridor Joint Powers Board.) Union Pacific operates a double track railroad between Sacramento and Oakland, a legacy of an earlier era when this route was an important intercity passenger corridor as well as heavy freight route. The route continues to accommodate heavy freight volumes. The part south of Oakland is single track and also accommodates heavy freight volumes.

An inspection of Table 3 shows that the Capitol Corridor has more commuter train-like attributes than the other two state corridors. It is considerably shorter than the other two state-supported intercity passenger corridors. It also offers commuter fare media as defined in Amtrak law's commuter definition, including monthly passes and 10-ride tickets good for 45 days from date of purchase. The northern two thirds of the corridor between Sacramento and Oakland Jack London Square provides 47 mph average speeds, comparable to those of the two other state corridors. However, the remaining segment to San Jose offers the considerably slower average speed of 33 mph, slower than many commuter services and a far cry from the recommended average speed for intercity corridor services of over 62 mph.

At around 29% of revenue seats occupied for FY2014-2015, the Capitol Corridor's load factor is lower than that for the other two state-supported corridors.[23] To find out whether the slow average speed south of Oakland is the culprit,[24] we contacted the Capitol Corridor Joint Powers Agency for passenger loadings between pairs of stations. The agency graciously complied[25] with October 2016 data, a recent month representative of patronage. It had no major events at the Oakland Coliseum to skew results. We grouped adjacent stations into geographic zones for the corridor, as shown in Table 4. The original data depicted passengers traveling from every station to every other station for October 2016. We compressed the table into six zones and divided results by 31 days in the month to show average daily passenger flowing between every pair of station zones. The results are shown in Table 5.

Table 5 confirms that the south end of the line (South Bay and Santa Clara/San Jose) exhibits much lower passenger loadings than the north end. The Santa Clara/San Jose zone has more population, is more congested, and (with Silicon Valley) has a more vibrant, technology-based economy

Table 4. Station Groupings for Capitol Corridor Depiction of Travel Between Station Zones

Sierra Foothills	SAC/Davis	Straits	East Bay	South Bay	Santa Clara/San Jose
Auburn Rocklin Roseville	Sacramento Valley Davis	Suisun-Fairfield Martinez	Richmond Berkeley Emeryville Oakland Jack London Oakland Coliseum	Hayward Fremont	Santa Clara Great America Santa Clara College San Jose Diridon

Table 5. Average Daily Passengers Between Capitol Corridor Station Zones, October 2016

		And					
		Sierra Foothills	**SAC/Davis**	**Straits**	**East Bay**	**South Bay**	**S. Clara/ San Jose**
Between	**Sierra Foothills**	0	81	17	70	1	5
	SAC/Davis		164	543	1,937	97	329
	Straits			32	316	10	53
	East Bay				38	44	548
	South Bay					0	107
	Santa Clara/San Jose						14
	daily station boardings and alightings	174	3,314	1,002	2,991	258	1,069

than does the Sacramento region, for example, and yet its two stations account for less than one third of the daily passengers of the two stations in the SAC/Davis zone. By far the heaviest passenger travel is between the SAC/Davis and East Bay zones, on the faster northern part of the corridor. There is relatively little passenger interaction between the north and the south. Most travel on the southern third of the corridor is confined within that segment.

Some observers might argue that low patronage on the southern end of the line is due to one half as many trains operating on it compared to the northern part of the corridor. Empirical research suggest otherwise, however. Elasticity of demand with respect to service frequency is about 0.4, meaning that if the number of trains operating on the south end were increased by 100 percent, patronage would increase by only 40 percent. Such an increase would inject more patronage into the northern part of the line, but given the very slow speeds on the south, the added passengers would not compensate for the largely empty trains running on the south end of the line. Pressure to add additional frequencies south of Oakland would lower load factors even more, unless the trains are speeded up dramatically.

A far more successful way to increase ridership would be to take advantage of research pointing to elasticities with respect to speed, which are generally between 1 and 2 for intercity rail services.[26]

A demand-oriented strategy for the Capitol Corridor would be to speed up the south part of the line. Shifting to another right-of-way between Martinez and Richmond would eliminate the slow-running section along San Pablo Bay--which will be under water eventually, due to sea level rise. The route also would benefit from lightweight, high-acceleration DMUs trainsets to replace the existing ponderous double-deck trains. The tendency to keep adding stations must be reversed. (See Conclusions.)

Caltrain Commuter Corridor

The nearly 150-year old double track corridor extends from San Francisco to San Jose, 45 miles, but since the 1980s, several trains daily have been extended farther south to Gilroy along a single-track route. Table 3 depicts the corridor between San Francisco and San Jose. We include this commuter rail system for comparison to the three state-supported corridors just described.

From 1870 into the 1980s this route was part of the Southern Pacific Company system. For much of that time, Southern Pacific operated heavy freight traffic and two types of passenger service over the route: long distance trains to Los Angeles and points further east, and commuter trains between San Francisco and San Jose. Most long-distance trains stopped only once or twice between San Francisco and San Jose, but commuter trains stopped at as many as 20 intermediate stations along the route. Several commuter trains did bypass many of the local stops, however. In later years, five express trains left San Jose in early morning hours during work days and bypassed many intermediate stops as they sped passengers to white collar jobs in San Francisco. Beginning in San Francisco at 5:14 PM, another five expresses returned city workers to their suburban homes, the classic picture of a commuter service.

In 1971 Southern Pacific rid itself of the last intercity passenger trains on this route, and the company wanted to eliminate what remained of the commute service, as well. Although patronage had declined steadily, too many passengers still used the commuter trains to allow their discontinuance. Beginning in 1980 Caltrans contracted with the Southern Pacific to continue with a subsidy to operate the commuter service, which Caltrans called Caltrain, and in 1985, Caltrans purchased the corridor from Southern Pacific and outfitted the service with new rolling stock.

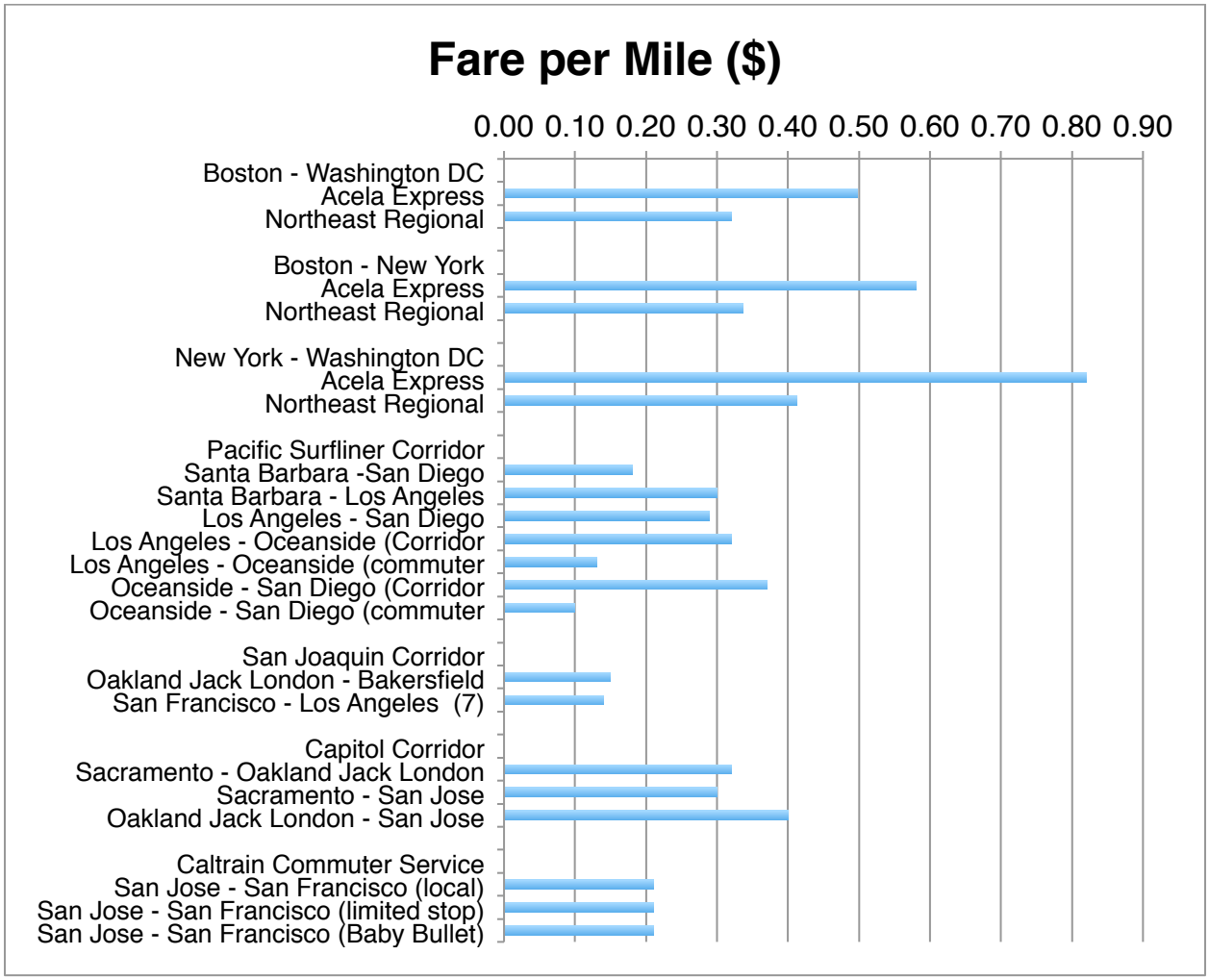
In 1987 the three counties served by the corridor formed the Peninsula Corridor Joint Powers Board to run the service. The JPB receives a combination of operations and capital funding from the state as well as what is now the Federal Transit Administration, via the Metropolitan Transportation Commission. Institutionally, Caltrain is now a part of the Bay Area's urban transit structure rather than the state and federal intercity rail structure.

The lesson of interest is the way service has evolved since the JPB came into existence. The orientation of a classic commuter service, linking suburb to a dominant central city, is gone. San Francisco still has a powerfully important central business district. However, dense employment as well as retail activity--in some places dense--is now distributed along the length of the corridor. In addition, a large number of people who work in the southern part of the corridor now live in San Francisco. No longer is the primary demand from suburban home to San Francisco workplace on weekday mornings and return on weekday evenings. Demand now is in both directions and is heavy at all times of the day and on weekends.

Although the agency running the corridor is not a private enterprise, it appears to have been sensitive to the nature of the market and has expanded its service accordingly. It understands that there are complex travel demands at many times of the day. There are a large number of travelers who travel long distances, perhaps not habitually every day to work, but frequently to different destinations for work-related purposes (such as attending meetings). There also are people who travel relatively short distances. A complex train service has arisen in response.

Originally most trains stopped at all stations, and the thrust of service planning seems to have been to add frequencies in order to have regular departures at all stations all day long. However, the resulting service was far too slow and tedious for passengers whose demands were for longer distance

travel. So, beginning in 2004 the JPA began adding limited stop express trains, called Baby Bullets. Baby Bullets differ from the expresses of the Southern Pacific era by operating all day long in both directions, seven days per week. Today, while 14 daily trains stop in each direction at most of the 22 stops along the line and average 30 mph, 11 Baby Bullets stop only at 7 stations and average 44 mph. They are heavily patronized. An additional 21 trains stop more frequently than the branded Baby Bullets but bypass many stops.



Evaluation of California's Three State-Supported Corridors and the Caltrain Corridor Against the Wikipedia Criteria

State-supported corridor trains operating in California's three intercity corridors meet neither the commuter nor the intercity train definitions provided by Wikipedia. They are neither fish nor fowl. Their many stops slow the trains downs to the point where they are not attractive to many making intercity trips. Yet, the stops are too few to adequately serve a commuter function. The state-supported trains most closely resemble Wikipedia's definition for regional all-stops locals. These are trains running relatively long distances at low average speeds, stopping at numerous stations.

We deduce from comparing the fares that there is demand for two distinctly different types of passenger trains in these corridors. One type would stop only at the largest population and employment centers, between which it would offer several daily frequencies operating at average

speeds in excess of 60 mph. The other type would be commuter trains, which would stop at many more places, offering average speeds of between 20 and 40 mph.

The one corridor in California where planners have been adequately sensitive to demand is the Caltrain commuter corridor. They clearly recognize this service distinction. Here there are three categories of service, distinguished by the number of stops that each category makes and the average speeds at which each category operates. The fastest category, the Baby Bullets, has an average speed almost 50% faster than the all-stops locals. The Baby Bullets have been a great step forward in service planning, as evidenced by its heavy patronage. If the top speed for the Baby Bullets was increased to 110 mph, the ridership would increase substantially. The Caltrain Corridor illustrates, that even for such a short corridor, there is a bifurcated demand that requires at least two very different types of train service.

Conclusions

While Northeast Corridor commuter fares are slightly higher than California commuter fares summarized in Table 3, fares charged for intercity corridor services in the Northeast Corridor are much higher than intercity fares in California. Service frequencies are similar in both regions and thus do not explain the fare differentials. What appears to explain them is the vastly faster intercity train service in the Northeast Corridor. There is a sizable segment of the public that demands to travel longer distances and is willing to pay much higher fares to achieve its travel desires. There undoubtedly are similar demands in the vast populated reaches of California, but because of the slow speeds of California's state-supported intercity corridor services, such demand generally avoids the trains.

For California to achieve a substantial increase in rail ridership, rail service needs a market-based model for rail service that is appropriate for dense urban corridors. Fortunately, there is one, and it is the Northeast Corridor from Boston to Washington, D.C. Examined in the context of this model, California's state-supported intercity corridor trains are not fulfilling their potential for attracting users from other modes. They are too slow, and are burdened by too many stops.

This is readily understandable, given the different historical legacy of California's intercity corridors, which includes their emergence from political compromises, rather than the discipline of market forces. California, however, now has the population and employment to generate travel demands similar to those in the Northeast. By applying the lessons of the Northeast Corridor, TRAC believes it is possible to deliver intercity service that competes well with congested highways.

Achieving that potential will require substantial additional infrastructure investment, including separate passenger rail rights-of-way and lightweight high-performance trainsets. It will also require the restructuring of service design and institutional reform. It may prove desirable to tender operations to private operators on these corridors, as that would be the most straightforward method of achieving a degree of independence from the inevitability of politics.

Politicians see new train stations as plums for their constituents, whose interests line up with the needs of commuters: they do not travel very far and want stations close to where they live. Case in point: while editing these very words, an announcement arrived calling on the Capitol Corridor to build a station in Hercules, signed by two congressmen, two mayors and a county supervisor. For an agency that relies on public funding, political pressure like that is impossible to ignore. Unfortunately, the political dynamic of catering to local wishes results in ever-slower rail travel, as stations are added. Additional stops would stimulate more short-distance riding, but slower speeds would reduce longer-distance ridership. The number of passengers could increase while the number of passenger-miles and revenue could decrease, as longer-distance passengers are driven away. Because their fares are what make these services economically feasible, the long-term viability of intercity rail is directly threatened by garden-variety politics. This is reason enough to be very concerned about the future of corridor services run by JPAs.

In short, the existing three corridor services in California are what you get when local politics overrides the demands of consumers, even when they have an extremely strong propensity to pay for fast service, as demonstrated by the dramatically higher intercity fares on the Northeast Corridor. Service allocations are the result of political processes and not market analyses. The public that wishes to travel longer distances is literally not represented--it is not concentrated into political districts where common interests prevail.

California greatly needs alternative modes of travel. Highways are jammed and climate change means that travel patterns must shift away from driving. It is clear that intercity passenger rail service in California needs to have certain attributes before it will attract the substantial ridership that is its potential.

First, passenger rail corridors need to be designed to facilitate two types of service: commuter and intercity corridor trains. Achieving such attributes will require additional infrastructure investment, which will carry a significant price tag, but be highly cost-effective in the long-run. The Northeast Corridor offers a good model. Catering to those going to work or engaging in personal business on a daily basis, commuter trains need to stop frequently, therefore operating more slowly. Their users expect low fares. Intercity corridor trains would stop only at the most important centers of population and employment and would operate at an average speed of at least 60 mph end to end. They would charge higher fares, which the longer-distance traveling public is willing to pay, as long as the trains are speedy.

Second, Intercity passenger corridors offering such service should be owned and operated by the state government, or by operators contracted by the state; commuter train agencies, whose orientation is local and regional, would be tenants. With careful attention to service design and institutional arrangements, California's rail services can be made far more useful to far more Californians.

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[1] https://www.law.cornell.edu/uscode/text/49/24102
downloaded by GLT on 25 November 2016.

[2] https://en.wikipedia.org/wiki/Commuter_rail
downloaded by GLT on 25 November 2016.

[3] http://www.thefreedictionary.com/commuter+train
downloaded by GLT on 25 November 2016.

[4] https://en.wikipedia.org/wiki/Inter-city_rail
downloaded by GLT on 25 November 2016.

[5] Value fares correspond to coach seat fares on airlines. Value Fare tickets are fully refundable if canceled more than 48 hours prior to the scheduled departure from the origin but will incur a 20% refund fee if canceled less than 48 hours prior to scheduled departure. Value Fare tickets can be canceled with the ticket value stored as a credit in an eVoucher that can be used for future Amtrak travel.

[6] Reference MIT report for Acela load factors

[7] Reference MIT report for load factors

[8] Commuter trains operate to Grand Central Terminal; all others to Penn Station.

[9] Metro North is a division of the New York Metropolitan Transportation Authority and operates all commuter trains operating from Grand Central Terminal, including those to and from New Haven. Metro North also owns and dispatches NE Corridor track and power infrastructure from New Rochelle, NY (where Amtrak trains from the Penn Station and the south join the route to New Haven) to the

Connecticut state line. From that point north to just beyond New Haven Union Station, Connecticut DOT owns, maintains, and dispatches the corridor. The distance from New Haven to New Rochelle, where Amtrak is a tenant on the corridor, is 55.7 miles.

[10] Included are NE Corridor Regional Expresses that operate only between New York and Philadelphia.

[11] The commuter operator is New Jersey Transit, which operates most transit services in the State of New Jersey. Commuter times in peak are in the low 70s minutes because of express trains; non-expresses are in the mid to high 90s. Time shown is the mean of a random pick of 9 schedules, including 2 expresses.

[12] SEPTA is the Southeastern Pennsylvania Transit Authority. The commuter fare is based on the single-ride ticket purchased off train ($9.00); 10-ride ticket is $8.00 per ride; single ride ticket purchased from conductor is $10.00.

[13] There are 9 stations where all trains stop; there are 6 additional stations where one or more of the trains stop.

[14] There are 7 stations where all trains stop; there is 1 additional station where one or more of the trains stop.

[15] Bus, SF Transbay Terminal to Emeryville (8.2 miles), train Emeryville to Bakersfield (310 miles), bus Bakersfield to Los Angeles Union Station (100 miles).

[16] Commuter fares are based on zones rather than types of service; San Jose to San Francisco is a Zone 4 fare. The fares are based on a monthly pass. The one-way fare is $9.75, or $0.21 per mile.

[17] Most Locals make 22 stops; a few make 23.

[18] Limiteds make from 11 to 19 stops.

[19] Baby Bullets make from 6 to 8 stops.

[20] LOSSAN Business Plan, 2016-17, p. 18 for passenger, passenger mile, and passenger mile per train mile trends, as well as for number of trains in service, and Wikipedia for train consists and number of revenue seats.

[21] Megabus reservation web page for the date of 23 January 2016. There were 5 departures from Los Angeles Union Station to San Francisco 4th and Townshend (Caltrain station) spread over a 24 hour period, with stops in San Jose and Oakland, with unreserved fares of $20. Most scheduled travel times between San Francisco and Los Angeles were 7 hours 30 minutes; the longest was 8 hours 10 minutes. Downloaded on 15 January 2017.

[22] San Joaquin JPA. 2016 Business Plan Update, Table 3.3 for passenger, passenger mile, and passenger mile per train mile trends, as well as for number of trains in service, and Wikipedia for train consists and number of revenue seats.

[23] From the CCJPA Business Plan Update for FY2016-17 to FY 2917-18, the Capitol Corridor's occupancy for FY 14-15 was 85.7 passenger-miles per train-mile. If all train consists are 4-cars, excluding seats in the lounge car, there are about 250 revenue seats, and the load factor is about 34%. If all train consists were 5-cars, with the lounge car exclusion, the load factor was about 25%. In practice, there is a mix of 4-car and 5-car consists serving the corridor, so the actual load factor was somewhere between 25% and 34%.

[24] Shedding anecdotal light on low passenger use on the southern end of the line, CBS San Francisco and Bay City News reported on southbound Capitol Corridor Train 527 striking an auto in Santa Clara at 10 am on Friday, 13 January 2017. The story reported that 45 passengers were on board the train. It is unclear whether the consist was 4 or 5 cars, but if the former, the load factor was about 18 percent and less if the latter. http://sanfrancisco.cbslocal.com/2017/01/13/capitol-corridor-train-motorist-killed-santa-clara-angew-lafayette/ downloaded by Greg Thompson on 19 January 2017.

[25] Capitol Corridor Joint Powers Agency, e-mail and data tables from Jim Allison, Planning Manager, and Tranika W. White, Senior Administrative Analyst, 1 February, 2017.
[26] R. Balcomb, et al. *The Demand for Public Transport: A Practical Guide*. Transport Research Laboratory, Report TRL 593, 2004.

ATTACHMENT 2

TRAC'S INTEGRATION PLAN FOR SAN JOA

By Michael D. Setty
Editor, California Rail News

Part of the deal-making by Governor Jerry Brown and the State Legislature to gain passage of the SB-1 transportation funding measure included earmarking $400 million to extend Altamont Commuter Express (ACE) commuter rail service to Modesto, Ceres, Turlock, Livingston/Atwater and Merced. ACE, currently running between Stockton and San Jose, had unfunded plans to extend to Merced, called ACEforward.

SB-1 raises gas taxes and registration fees to for improved highway and street maintenance, as well as more funding for transit capital and operations, intercity rail, pedestrian and bicycle projects.

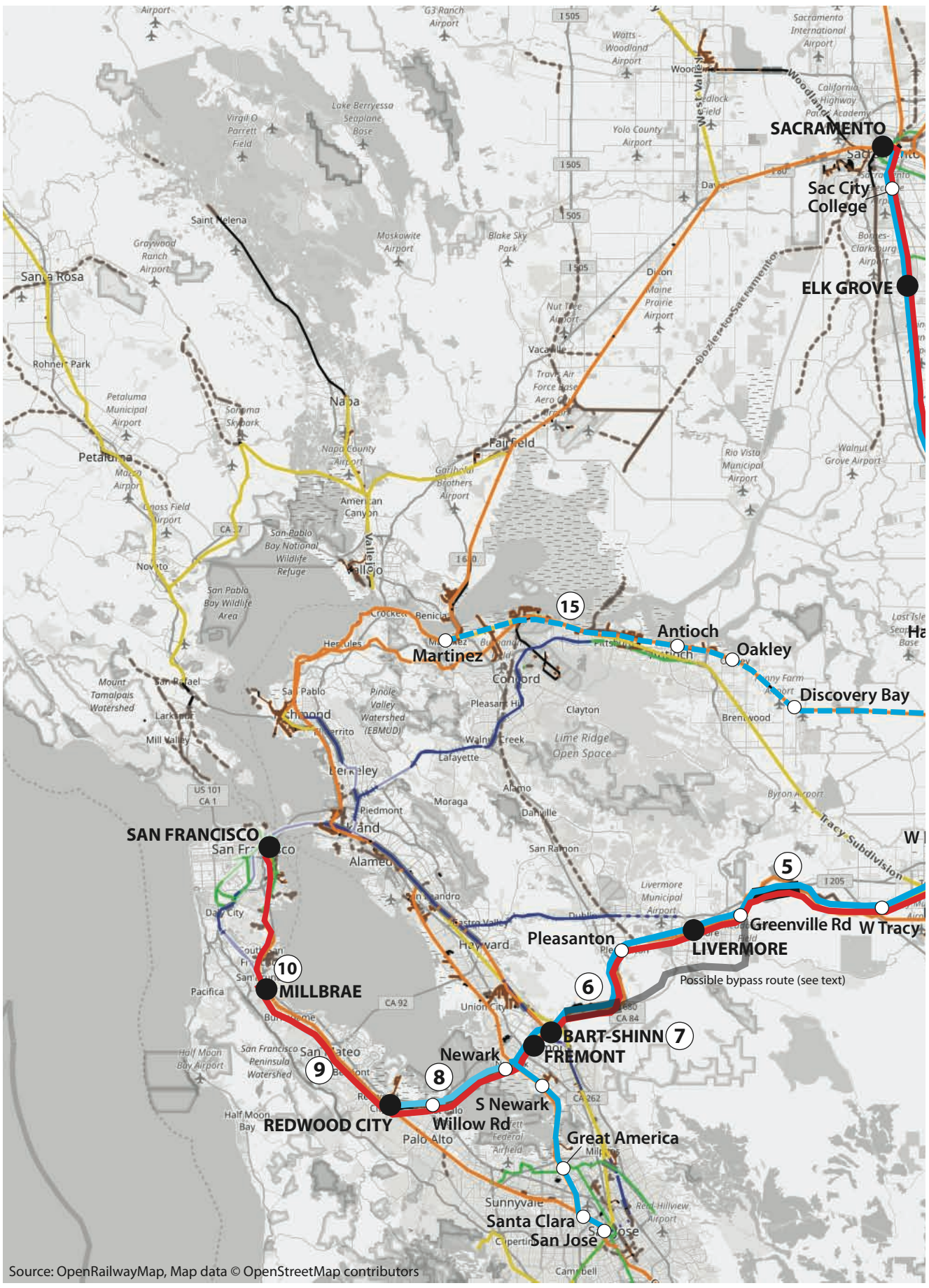
Now that a large portion of the ACEforward program is funded, TRAC sees tremendous potential for synergy between ACE and the San Joaquins. Combining their capital programs will allow the creation over time of an East-West Altamont route that is both much faster and much more reliable for both services, since much greater capacity would be available for both passenger trains and freight traffic.

The ACE route is far better matched to projected Bay Area travel demand than the San Joaquin's current route. Putting the trains from both services on the same tracks would substantially expand the availability of service. This would effectively convert ACE to an all-day transit provider, a long-time goal. The resulting convenient schedule would attract large numbers of passengers away from their cars, thereby aiding the State's climate program. Rerouting San Joaquins via the Altamont also opens up potential direct service between the Central Valley and San Francisco, the San Francisco Peninsula and Silicon Valley. Direct service to Sacramento would be offered as additional track capacity is developed.

These synergies could be achieved in the near-term, depending on negotiations for Altamont track capacity. San Joaquin trains from Bakersfield could pull into the Stockton ACE platform, then change directions to head west to the Tri-Valley and East Bay. A bus bridge (and perhaps future DEMU service) connecting Martinez and Stockton would support existing passengers as service is realigned.

Travel times will become faster than the current San Joaquin schedule as the improvements proposed below are brought into service. Connecting to the Capitol Corridor in Fremont (Centerville) opens the San Joaquin to the rich job market of the East Bay. The proposed new stops would substantially improve the cost-effectiveness of the new route between Lathrop and Merced.

By integrating ACE and San Joaquins service, other opportunities include dramatically expanded San Joaquins schedules serving Sacramento. Potentially large ridership gains can be achieved by rerouting service via Altamont Pass, the Dumbarton Corridor and via Caltrain tracks to San Mateo County and San Francisco. This reroute would also open up possibilities for direct intercity rail service from San Francisco and the South Bay to Stockton and Sacramento.



The remainder of this article outlines the details of proposed services and needed capital improvements to support proposed operations, with attention on retaining existing rail freight capacity.

Summary of Proposed Upgrades

Please refer to the numbered items on the map above.

ACEforward Enhancements

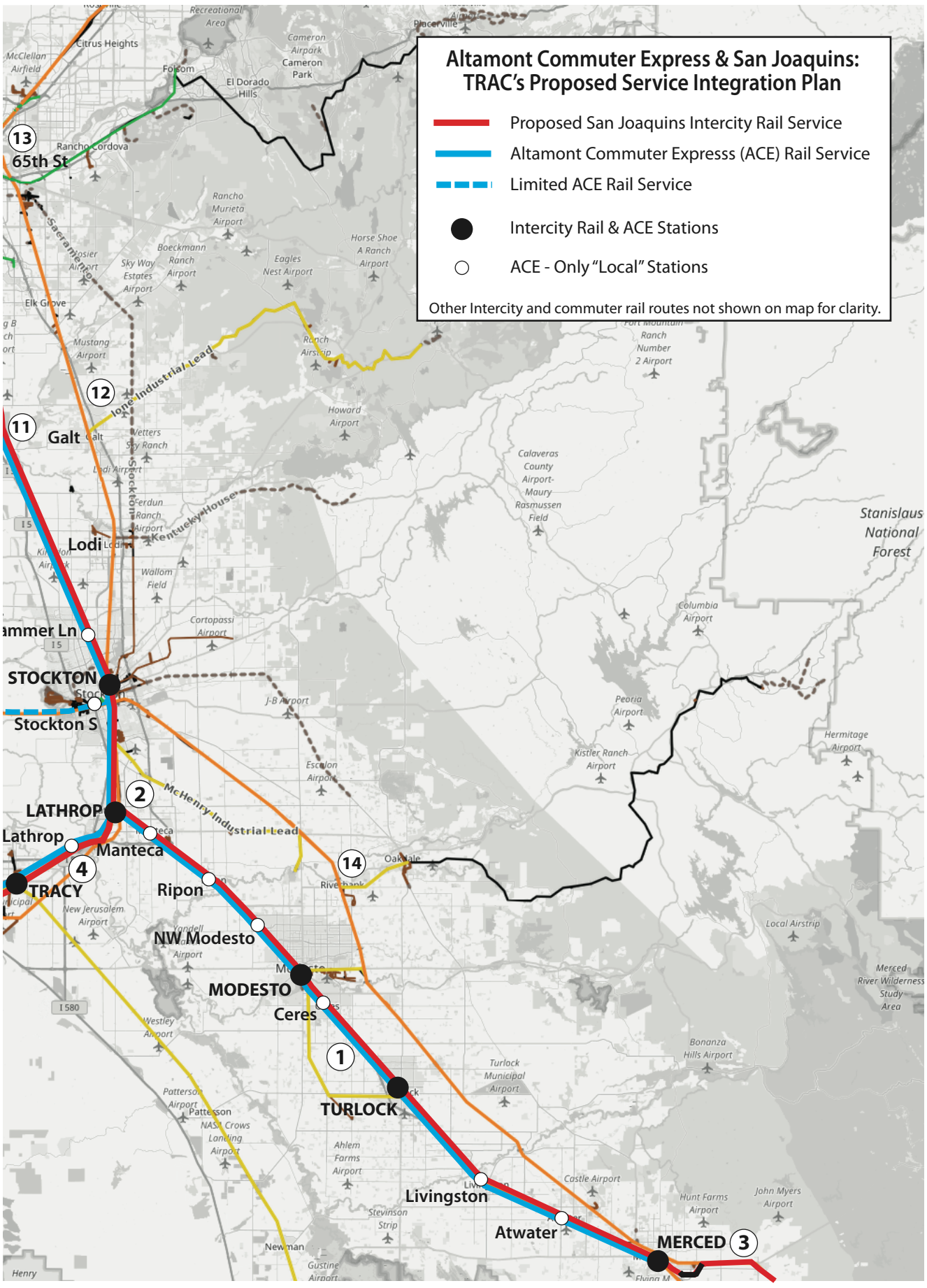
1. ACEforward extension to Modesto and Merced. The second track constructed by ACEforward alongside the existing Union Pacific freight tracks paralleling Highway 99 from the Lathrop/Manteca areas to Stanislaus and Merced Counties would be designed to allow operation of passenger trains every 30 minutes all-day. This would require constructing two primarily passenger tracks at most stations, and three to five-mile long 3rd passing tracks at selected locations. New infrastructure should be designed to allow San Joaquins to operate hourly in each direction, along with at least hourly ACE trains during the morning and afternoon peaks, and two-hourly midday, evenings and weekends.

2. Lathrop Junction Transfer Station. Construct new transfer station at Lathrop Junction with platforms, passenger overcrossings of mainline track, and other facilities as needed to accommodate timed, cross-platform connections, allowing direct access from any direction to Sacramento, the ACE extension along Highway 99 to Modesto and Merced, the San Joaquin route to Bakersfield, and the Bay Area via Altamont.

3. Construct a new track connection in South Merced to transition San Joaquins off existing Burlington Northern Santa Fe trackage to new passenger tracks between Merced and Lathrop. This might be a new surface connection adjacent to University Parkway or a short tunnel paralleling Highway 140. A lower-cost connection could use the existing rail spur north of Central Merced to make the connection, and serve the existing Amtrak Merced station.

4. Reroute existing passenger service between Lathrop and West Tracy via

QUINS & ALTAMONT COMMUTER EXPRESS



the prior Southern Pacific Altamont Pass route through downtown Tracy. This routing would provide much better, more central service to the 90,000 residents of Tracy, and would also allow rerouted San Joaquins to serve the community. Connect tracks to the existing Union Pacific alignment west of I-580. Double track this segment, as previously operated by SP.

5. Through the Altamont Pass area, construct a new double-track tunnel and/or new alignment(s) parallel to I-580 to reduce 5-10 minutes running time in each direction, and to facilitate future line upgrades to 110 and/or 125 standards. To expand capacity between Altamont Pass and the tunnel in Niles, consider the options studied in the 2011 Preliminary Alternatives Analysis for the Altamont Corridor Rail Project. This could be a major project for the Transit and Intercity Rail Capital Program, or for private capital. Select a route that avoids the Tri-Valley downtowns and does not share tracks with freight trains, if possible.

6. To expand capacity between Altamont Pass and the entrance to Niles Canyon, consider the options studied in the 2011 Preliminary Alternatives Analysis for the Altamont Corridor Rail Project. This could be a major project for the Transit and Intercity Rail Capital Program, or for private capital. Select a route that bypasses the Tri-Valley downtowns and the winding Niles Canyon line, and does not share track with freight trains if possible.

7. New San Joaquins/ACE/BART transfer station at Shinn Street in Fremont. The pedestrian-only connection to/from BART would offer no local access except for emergencies, similar to the new BART/eBART station in the median of Highway 4 a half-mile east of the existing Pittsburg/Bay Point BART station.

San Francisco Segment

8. Rebuild the Dumbarton Rail Bridge and rail corridor, with new stations in Newark and Willow Road (Facebook) in Menlo Park. This project would connect Fremont with the Caltrain Corridor, costing less than $300 million if the unneeded capital improvements proposed in recent government studies are dropped. A local service provider is to be determined on Dumbarton line.

9. Extend San Joaquins service from Fremont to San Francisco via the Dumbarton Bridge, Redwood City and the Caltrain Corridor, taking advantage of new passing tracks between the Redwood City station and San Mateo proposed by the California High-Speed Rail Authority. These trains would provide connections to the northern part of Silicon Valley, its employment center.

10. Stop at the Millbrae BART/Caltrain station, connecting to BART and SFO.

Sacramento Segment

11. From Stockton, extend San Joaquins and ACE service to Sacramento via Union Pacific's Sacramento Subdivision (the prior Western Pacific). Capital improvements include new stations and passing sidings or double-tracking as required.

12. Provide East-West Bus Connections between Lodi, Galt and 65th Street in East Sacramento (connecting to light rail and Sacramento State University), and the ACE/San Joaquin stations to the west.

13. New track connection from north-south UP line with loop track to east-west UP route on currently vacant property east and north to provide direct access into Sacramento Valley station. Add two tracks between this point and the station to avoid freight conflicts.

14. Provide East-West Bus Connections between Denair, East Modesto, Riverbank-Oakdale, and Escalon, and the respective ACE/San Joaquin stations to the west.

Martinez Segment

15. Provide DEMU shuttle service between Stockton and Martinez, replacing current San Joaquins service on this route. This will free up slots for expanded Capitol Corridor service west of Martinez.

Rolling Stock

Replace existing ACE locomotive-hauled trains with DEMUs. DEMUs offer great flexibility. Their lower operating costs allow them to be used in short trains off-peak. They can split and combine trains when a route has more than one potential destination. For example, trains originating on the Highway 99 extension to Stanislaus and Merced Counties could operate with two DEMU trainsets coupled together, splitting at Lathrop Junction, with one section traveling to Sacramento, and the other into the Bay Area. Similarly, trains originating in Stockton could operate with two DEMU sets, splitting at Centerville (Fremont), with one section traveling to San Francisco and the other to San Jose, in both directions.

Service Plan

ACE and the San Joaquins would be coordinated, to provide consistent day-long service. ACE would be an all-stops commuter service, while San Joaquins would be an intercity service, with many fewer stops and higher speeds. See the accompanying article describing the difference between these service types.

ATTACHMENT 3

The New York Times | https://nyti.ms/2hIU01N

How Politics and Bad Decisions Starved New York's Subways

Disruptions and delays have roiled the system this year. But the crisis was long in the making, fueled by a litany of errors, a Times investigation shows.

By BRIAN M. ROSENTHAL, EMMA G. FITZSIMMONS and MICHAEL LaFORGIAPhotographs by JOHN TAGGART NOV. 18, 2017

After a drumbeat of transit disasters this year, it became impossible to ignore the failures of the New York City subway system.

A rush-hour Q train careened off the rails in southern Brooklyn. A track fire on the A line in Upper Manhattan sent nine riders to the hospital. A crowded F train stalled in a downtown tunnel, leaving hundreds in the dark without air-conditioning for nearly an hour. As the heat of packed-together bodies fogged the windows, passengers beat on the walls and clawed at the doors in a scene from a real-life horror story.

In June, after another derailment injured 34 people, Gov. Andrew M. Cuomo declared that the system was in a "state of emergency."

But the problems plaguing the subway did not suddenly sweep over the city like a tornado or a flood. They were years in the making, and they might have been avoided if decision makers had put the interests of train riders and daily operations ahead of flashy projects and financial gimmicks.

An examination by The New York Times reveals in stark terms how the needs of the aging, overburdened system have grown while city and state politicians have consistently steered money away from addressing them.

Century-old tunnels and track routes are crumbling, but The Times found that the Metropolitan Transportation Authority's budget for subway maintenance has barely changed, when adjusted for inflation, from what it was 25 years ago.

Signal problems and car equipment failures occur twice as frequently as a decade ago, but hundreds of mechanic positions have been cut because there is not enough money to pay them — even though the average total compensation for subway managers has grown to nearly $300,000 a year.

Daily ridership has nearly doubled in the past two decades to 5.7 million, but New York is the only major city in the world with fewer miles of track than it had during World War II. Efforts to add new lines have been hampered by generous agreements with labor unions and private contractors that have inflated construction costs to five times the international average.

New York's subway now has the worst on-time performance of any major rapid transit system in the world, according to data collected from the 20 biggest. Just 65 percent of weekday trains reach their destinations on time, the lowest rate since the transit crisis of the 1970s, when graffiti-covered cars regularly broke down.

None of this happened on its own. It was the result of a series of decisions by both Republican and Democratic politicians — governors from George E. Pataki to Mr. Cuomo and mayors from Rudolph W. Giuliani to Bill de Blasio. Each of them cut the subway's budget or co-opted it for their own priorities.

They stripped a combined $1.5 billion from the M.T.A. by repeatedly diverting tax revenues earmarked for the subways and also by demanding large payments for financial advice, I.T. help and other services that transit leaders say the authority could have done without.

They pressured the M.T.A. to spend billions of dollars on opulent station makeovers and other projects that did nothing to boost service or reliability, while

leaving the actual movement of trains to rely on a 1930s-era signal system with fraying, cloth-covered cables.

They saddled the M.T.A. with debt and engineered a deal with creditors that brought in quick cash but locked the authority into paying $5 billion in interest that it otherwise never would have had to pay.

In one particularly egregious example, Mr. Cuomo's administration forced the M.T.A. to send $5 million to bail out three state-run ski resorts that were struggling after a warm winter.

At the same time, public officials who have taken hundreds of thousands of dollars in political contributions from M.T.A. unions and contractors have pressured the authority into signing agreements with labor groups and construction companies that obligated the authority to pay far more than it had planned.

Faced with funding shortfalls, the M.T.A. has resorted to borrowing. Nearly 17 percent of its budget now goes to pay down debt — roughly triple what it paid in 1997.

"It's genuinely shocking how much of every dollar that goes to the M.T.A. is spent on expenses that have nothing to do with running the subway," said Seth W. Pinsky, the former head of the city's Economic Development Corporation. "That's the problem."

Reporters for The Times reviewed thousands of pages of state and federal documents, including records that had not previously been made public; built databases to compare New York with other cities; and interviewed more than 300 people, including current and former subway leaders, contractors and transit experts.

The examination found that the agency tasked with running the subway has been roiled by turnover and changes to its management structure. Dozens of people have cycled through high-level jobs, including many who left to work for contractors who do business with the M.T.A. Byzantine layers of bureaucracy have allowed transit leaders and politicians to avoid responsibility for problems.

ATTACHMENT 4

"ELECTRIC FAST FREIGHT" IN CALIFORNIA?

MOVING SHORT-DISTANCE TRUCK FREIGHT TO RAIL

by Michael D. Setty
Editor, California Rail News

California freight planners have much to learn from the tiny country of Austria. In 2015, Austria carried about 40% of all freight ton-miles within the country, compared to the U.S. rail freight industry average of about 35% (2011 data). What's striking is Austrian rail's far greater penetration into the shorter-distance freight market. 27% of the total tonnage carried is containerized freight traveling 200-300 mile distances, short by U.S. railroad standards.

In the U.S., trucks dominate freight shipments up to 500 miles, while railroad freight is dominant over longer distances. Most U.S. rail ton-miles are generated by heavy, bulky materials such as coal and agricultural products. Long-distance container traffic such as "double stacks" make up a smaller share.

Unlike the U.S., over short distances in Austria and neighboring countries, rail is often very competitive with trucks for intermodal traffic. Austria's rail freight network operates frequent trains alongside very frequent passenger service. Most Austrian freights operate at close-to-passenger train speeds, on fixed schedules. The relatively short trains of between 10 and 50 containers or truck trailers can be quickly loaded and unloaded. Austria leads in quick container and truck trailer loading/unloading technology, such as the "ISU" loading/unloading system pioneered by the Austrian Federal Railway's Rail Cargo Logistics division.

ISU technology used in Austria for quickly loading & unloading trailers.
(Source: Rail Cargo Austria)

The fact that all Austrian mainlines are electrified also allows fast operation of the many relatively short freight trains of between 500 and 1,500 tons, in contrast to the standard U.S. freight railroad practice of making up long, heavy 100-200 container, 5,000-7,000 ton trains. That is a train size that can only economically serve 500-mile+ markets such as California to the Midwest, Texas, or the East Coast.

Over the past half-century, U.S. freight railroads have undertaken many efforts to capture high-value traffic that mostly travels by truck, such as Trailers on Flatcar (TOFC), Double Stacks, Roadrailers and other intermodal approaches. While these have been technically successful, they have not proven truly competitive with trucks in the long-term, except in special cases.

Electric intermodal freight in Austria.
(Wikimedia: Steffs 88, own work)

In California as in many other places, growing truck traffic contributes to an increasingly critical congestion crisis. While rail freight service is particularly important in carrying goods between California's ports and out-of-state markets, freight rail's competitiveness for intrastate traffic is extremely limited. Only about 2% of California's intrastate freight traffic is carried by rail, i.e., 98% travels by truck.

This is due to two major factors. First, most non-local freight travels less than 500 miles, where rail is not competitive except for heavy, low value commodities. Second, rail links between Southern California and the Central Valley/Northern California are extremely indirect with very long travel times compared to by truck. For example, there is Union Pacific's 480-mile Coast Route between Los Angeles and San Francisco, but typically only two daily, slow freight trains in each direction. Freight travel distances and times via Tehachapi Pass, Bakersfield and the San Joaquin Valley are even longer than the Coast Route.

"CargoBeamer" is an innovative, automated European terminal that slides trailers on/off freight cars for quick loading & unloading of intermodal traffic. (Source: CargoBeamer)

Applying the Austrian Model to California

In the past, California Rail News has featured articles proposing a new rail link between Bakersfield and Los Angeles via Tejon Pass, parallel to Interstate 5 (See April-July 2016, April-July 2015, August 2014). While these articles focus on a new line for passenger trains, its high capital costs mean the investment of private capital to enable fast rail freight traffic would make a new Tejon Pass line far more economically feasible.

According to recent freight studies for the I-5 and Highway 99 corridors, freight traffic within California totals approximately 819 million U.S. tons, or roughly 41 million truckloads annually. Of total annual statewide freight volume, 80% is deliveries within local areas and is therefore "truck-captive." This local traffic includes parcels, fuel trucks, gravel, and similar commodities.

About 164 million tons (8.5 million truckloads) of freight travels between various subareas of California. Because these trucks generate large amounts of air pollution and greenhouse gas emissions, electrification of freight is part of the State's Sustainable Freight Plan. Of this longer-distance travel, about 35% (3 million truckloads) travels over Tejon Pass via I-5 in and out of the Los Angeles Basin. This intrastate traffic makes up roughly 9,000-10,000 out of the 12,000-13,000 5+ axle trucks that travel over Tejon on a typical weekday (many of the additional moves are empty backhauls or long-hauls to out-of-state destinations).

According to surveys of shippers, between 60% and 80% would consider shipments by intermodal rail freight. Their primary requirements were competitive pricing and reasonable travel times compared to trucks.

Electrically-powered freight trains would not be much slower than passenger trains on a new rail line via Tejon Pass, designed for 125-140 mph. The line would connect with electrified new tracks along the Union Pacific and Burlington Northern Santa Fe mainlines through the San Joaquin Valley. With full electric operation between the Ports of Los Angeles and Long Beach, as well as inland freight terminals in Southern California, the Central Valley and Bay Area, freight travel times of between 5 and 10 hours appear possible, depending on distance. Such a line would compete well with intrastate trucking.

Assuming that California electric fast freight can attract a 40% to 50% market share (versus the 60% to 80% implied by shipper surveys), the intrastate intermodal freight market may be worth $700 million to $1.1 billion annually, based on truckload rates averaging $2.00 per trailer-load-mile. This is sufficient to cover direct operating expenses and a significant portion of capital costs for a new Tejon Pass rail line and strategically located intermodal terminals throughout the state.

The State can be expected to support this freight electrification initiative as part of its climate change efforts. The full project would include new tracks and associated electrification along existing freight mainlines. (This estimate does not include any estimate for revenues from general freight traffic that could also use the Tejon Pass route). Learning from Austria's success with shorter-distance fast electric freight, this concept appears to be an economically viable option worthy of serious study.

Michael D. Setty is a long-time transit planner.

ATTACHMENT 5

Congestion Pricing Was Unpopular in Stockholm — Until People Saw It in Action

Stockholm transportation director Jonas Eliasson has some advice for New York politicians worried about diving into congestion pricing: Just do it.

By David Meyer | Nov 28, 2017 | 4

Stockholm newspaper front pages, before and three weeks after congestion pricing took effect. Image: Jonas Eliasson

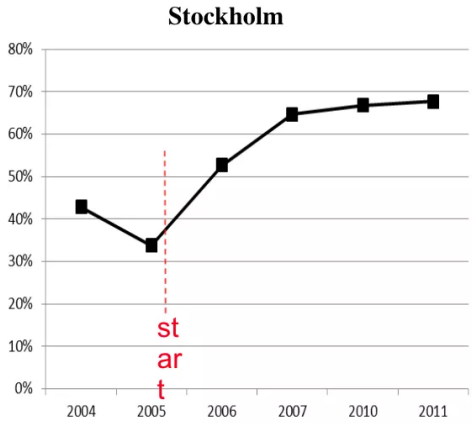
It's natural for politicians to feel squeamish about enacting a big policy change like congestion pricing. People who've grown used to free driving privileges defend them loudly, while the potential benefits feel diffuse and uncertain. That may explain why Mayor de Blasio hasn't warmed to congestion pricing despite its promise to deliver a fairer, safer, greener, and more efficient transportation system.

Stockholm transportation director Jonas Eliasson has some advice for New York officials worried about diving in: Just do it.

Eliasson steered the implementation of congestion pricing in Stockholm in 2006. From that vantage point, he watched a skeptical public quickly embrace the policy as soon as they saw it in action. Eliasson shared lessons from the city's experience in a talk at TransitCenter last night.

When Stockholm began charging drivers to access the city center, car trips across the cordon dropped 20 percent. Travel times improved immediately, and emissions fell. Contrary to doomsday predictions from Stockholm media and political opponents of congestion pricing, the policy was an overnight success.

Before implementation, public support for congestion pricing had fallen below 40 percent. After a six-month trial period in 2006, more than 52 percent of Stockholm residents voted to make it permanent. By 2011, public support for road pricing stood at nearly 70 percent, and above 50 percent even among people who pay the fees most often.



Support for congestion pricing among Stockholm residents increased dramatically once the policy was implemented. Image: Jonas Eliasson

"The closer you get to implementation, the more the drawbacks stand out," Eliasson said. "If you survive this valley of political death, and people actually see the benefits, and also realize that, in addition to the benefits, it's actually not as bad as you thought — it's not so hard adapting to this — then support starts going up again."

Pricing worked because the transportation planners who put it together prioritized systemic improvements for traffic and transit over the whims of elected officials and political parties. Getting the details of the pricing system right was too important to leave in the hands of politicians.

"Designing an efficient and effective congestion pricing scheme that actually delivers benefits is not easy," Eliasson said. Deciding the specifics of where tolls should be placed, the price at which they should be set, and when they should be in effect is "really the job for experts."

In Sweden, the effectiveness of road pricing helped raise public awareness of the drawbacks of other car subsidies. “It did something to the rationality of transport policy debate,” Eliasson said. “We don’t have debate anymore [about] ‘parking pricing is just philosophically wrong’ — no one says that anymore.”

If the policy passes in New York City, Eliasson thinks it could have a similar impact on transportation policy globally.

The specifics of the forthcoming congestion pricing plan from Governor Cuomo have yet to be revealed, but the governor reportedly intends to introduce a plan in the 2018 state legislative session.

Filed Under: Congestion Pricing, Stockholm, TransitCenter, Promoted

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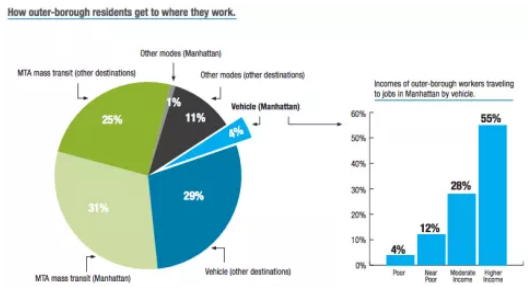

De Blasio’s Wrong: There’s a Fair Congestion Pricing Plan Right Under His Nose

ATTACHMENT 6

Walkable Streets

AUGUST 18, 1994 · 11:44 AM

The Triple Convergence

Stuck in Traffic (1992), pp. 27-29, by Anthony Downs

"Nearly every vehicle driver normally searches for the quickest route, one that is shorter or less encumbered by obstacles (such as traffic signals or cross-streets) than most other routes. These direct routes are usually limited-access roads (freeways, expressways, or beltways) that are faster than local streets if they are not congested. Since most drivers know this, they converge on such 'best' routes from many points of origin.

The problem is that during the peak travel hours on weekdays, so many drivers converge on these 'best' routes that they become overloaded, particularly in metropolitan areas. Traffic on them eventually slows to the point where they have no advantage over the alternative routes. That is, a rough equilibrium is reached, which means that many drivers can get to their destinations just as fast on other roads. At times, the direct road may become even slower than alternative streets, and some drivers eager to save time will switch to them. Soon rough equality of travel times on both types of route is restored at the margin. The opposite happens if travel becomes slower on alternative streets than on the expressway.

Such observations can be made about this equilibrium situation: (1) it tends to recur, because most drivers develop habitual travel patterns; (2) during equilibrium each limited-access road is carrying more vehicles per hour than each normal city street or arterial route because it has more lanes, more direct routing, and fewer obstacles; (3) many drivers time their journeys to miss these periods because they do not like to waste time in heavy traffic; and (4) at the peak of equilibrium, traffic on most expressways is crawling along at a pace far below the optimal speed for those roads, as explained below. Now suppose that the limited-access route undergoes a vast improvement — its four lanes are expanded to eight. Once its carrying capacity is increased, the drivers using it move much faster than those using alternative routes. But this disequilibrium does not last long because word soon gets around that conditions on the expressway are superior.

In response, three types of convergence occur on the improved expressway: (1) many drivers who formerly used alternative routes during peak hours switch to the improved expressway (spatial convergence); (2) many drivers who formerly traveled just before or after the peak hours start traveling during those hours (time convergence); and (3) some commuters who used to take public transportation during peak hours now switch to driving, since it has become faster (modal convergence).

The triple convergence causes more and more drivers to use the improved expressway during peak hours. Therefore its traffic volumes keep rising until vehicles are once again moving at a crawl during the peak period. This outcome is almost inescapable if peak-hour traffic was already slow before the highway was improved. If traffic is going faster than a crawl on this direct route at the peak hour, its users will still get to their destinations faster than users of city streets, which are less direct and more encumbered by signals and cross-streets. Total travel times on these two types of paths will only become equalized if the limited-access roads are so overloaded that vehicles on them are moving at slower speeds than those on normal streets. Triple convergence creates just such an effect during peak hours...

...In any event, expanding roadway capacity does not fully eliminate peak-hour traffic congestion, or even reduce the intensity of traffic jams during the most crowded periods — although those periods will be shorter. In fact, it is almost impossible to eradicate

peak-hour traffic congestion on limited-access roads once it has appeared within a nonshrinking community. In theory, such congestion could be eliminated only if the capacity of those roads were increased to the extent that they could carry every single commuter simultaneously at the peak minute at, say, 35 miles per hour or faster. In nearly all metropolitan areas, that is impossible. Therefore, expansions of road capacity — no matter how large, within the limits of feasibility — cannot fully eliminate periods of crawling along on expressways at frustratingly low speeds."

Related

Traditional Neighborhood Development: Will the Traffic Work?
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In "New Urbanism: Timeless, Traditional, Walkable Design"

7 responses to "*The Triple Convergence*"

Dick Falkenbury

November 16, 2014 at 7:22 pm

You have absolutely no idea of what you are talking about. What you are talking about is a mathematical 'theoritcal model of what traffic might look like and act.

First, fully sixty per cent of all traffic congestion is caused by accidents and breakdowns. That is why all radio traffic reports begin with accidents and breakdowns.

Second, most drivers have no alternative. They drive what they are assured are the best routes–normally the 'shortest' and the limited access freeways. The problem is, once committed to the limited access roadway, you are stuck there. Traffic jam causing accidents are worse of the freeway because the cars are traveling much faster than on other roadways.

ATTACHMENT 7

Caltrans' Choice of Unsuitable Car Design Will Hamper Rail

By Michael D. Setty
Editor, California Rail News

In 2012, Caltrans and Illinois entered into a $551 million agreement with Sumitomo and Nippon Sharyo to purchase 137 double-deck rail passenger cars. The idea was to build a next generation of cars similar to the "California Car" design originated by Caltrans in 1996, and Amtrak's similar Pacific Surfliner fleet purchased n 2002.

Illinois would have received 88 cars, and 49 were allocated to California for the Capitol Corridor, San Joaquins and Surfliners. These cars would have been compatible with California's existing intercity fleet, as well as Amtrak's large fleet of Superliners, making easy access for passengers consistent in both the Midwest and West.

Unfortunately, in 2015 a prototype car failed mandatory safety tests, under-mining the entire project. In October 2017 Caltrans and Illinois canceled the contract. After the states allowed design standards to be lowered, the double-deck order was replaced by a new order for the same number of single-deck cars with lower capacity, to be built at the Siemens plant in Sacramento.

Seemingly overlooked in the celebratory press release is a serious problem: a single-floor car has 25% to 30% less seating capacity than a double-decker, thereby locking in higher operating costs by design.

Wrong Design, Wrong Corridors

Introducing new trains with 51-inch high floors (serving 48" platforms) creates many problems. These include greatly diminished ease of access. The existing fleet of more than 400 California Cars, Surfliners, and the Bombardier and Rotem double-deck cars operated by ACE, Caltrain, San Diego's Coaster, and Southern California's Metrolink uniformly have 17"to 18" floor heights (as does Amtrak's Superliner fleet). Most California passenger stations have 8" platforms "above the rail," requiring only a single step to enter/exit a train. One-step access has become mainstream in California and Europe.

For fully ambulatory people, the Siemens cars take a big step backwards in access provisions, and require climbing and descending five steps. They also complicate loading and unloading of bicycles with their narrow doors. For many seniors and other persons with disabilities, getting on or off the train will become a big hassle compared to the easy access of the California cars.

Wheelchair users will be further inconvenienced since lifts will be needed, adding 5-10 minutes to station dwell times–as suggested by the inferior performance on the San Joaquins and Surfliner schedules operated with refurbished single-level, high-floor Comet cars from New Jersey Transit. The San Joaquin and Surfliner schedules became unreliable once the Comets were assigned.

Ironically, the Capitol Corridor believes it can offset the added five minutes needed to serve the new Fairfield/Vacaville station by reducing dwell times at other stations to one to two minutes. Trains operating with Siemens single-deck, high-floor rolling stock beginning in 2019 are likely to require more time in their schedules–getting on and off will take longer compared to the current bilevel fleet.

There is an Alternative

A better solution for both California and the Midwest corridors radiating from Chicago is to assign the Siemens car order to Amtrak for use in the Northeast Corridor, where high station platforms are the norm. This should be possible since the Federal government is providing most of the funding.

Instead, the agencies managing the Capitol Corridor, San Joaquins and Pacific Surfliners should insist upon cars which match the accessibility features and capacity of their double deck fleets.

If alternative cars are to be considered, they should at least have modern features like low-level boarding, superior acceleration, and modular design, like modern diesel multiple unit (DMU) sets. With DMUs, operating costs could be greatly reduced and train capacities more precisely matched to demonstrated demand.

For example, the Capitol Corridor averages a load factor of about 28% to 37% of capacity, depending on whether a particular train has four or five cars. Modern DMU trainsets such as those ordered by TEXRail in Fort Worth meet modernized Federal safety rules, and have 24" floor heights. As each car is self-powered, DMUs make possible the right-sizing of train length, avoiding unnecessary operating costs.

DMUs generally have half the weight per seat as locomotive-hauled trains, requring much smaller engines, thus reducing capital and maintenance expenses. For the same passenger load, DMUs are generally about three times more fuel efficient.

The current contract with Siemens is a dramatic step backward from the great progress acheived by intercity rail since the 1990's. The potential for a great expansion in ridership will be halted if trains are too difficult to board and alight, also undermining the draft California State Rail Plan's key objective. No funds are in sight that would make it possible to upgrade all platforms in the state to an eventual high platform standard.

The choice is simple: Should California use its limited rail funding to buy more trains or to buy concrete for higher platforms? The answer is obvious... Instead of heading down that road to failure, TRAC strongly opposes the procurement of high-floor single-level cars for California.

ATTACHMENT 8

Obsolete Regs Obstruct Level Boarding

By Michael D. Setty
Editor, California Rail News

In 1948, the California Public Utilities Commission (CPUC) established a rule that no platforms or objects taller than 8" could be located closer than 7 feet, 6 inches from track centerlines. This was enacted to provide clearances for brakemen hanging off the side of freight cars when switching, a routine practice 70 years ago but now virtually nonexistent near passenger stations.

In contrast, Massachusetts requires 6'-6" side clearances from the center of track for objects such as switch stands that are less than 3' high, in order to accommodate extra-wide freight cars. Florida and other states only require 6'; Texas is flexible in this regard, while Oregon and a few other states match California rules.

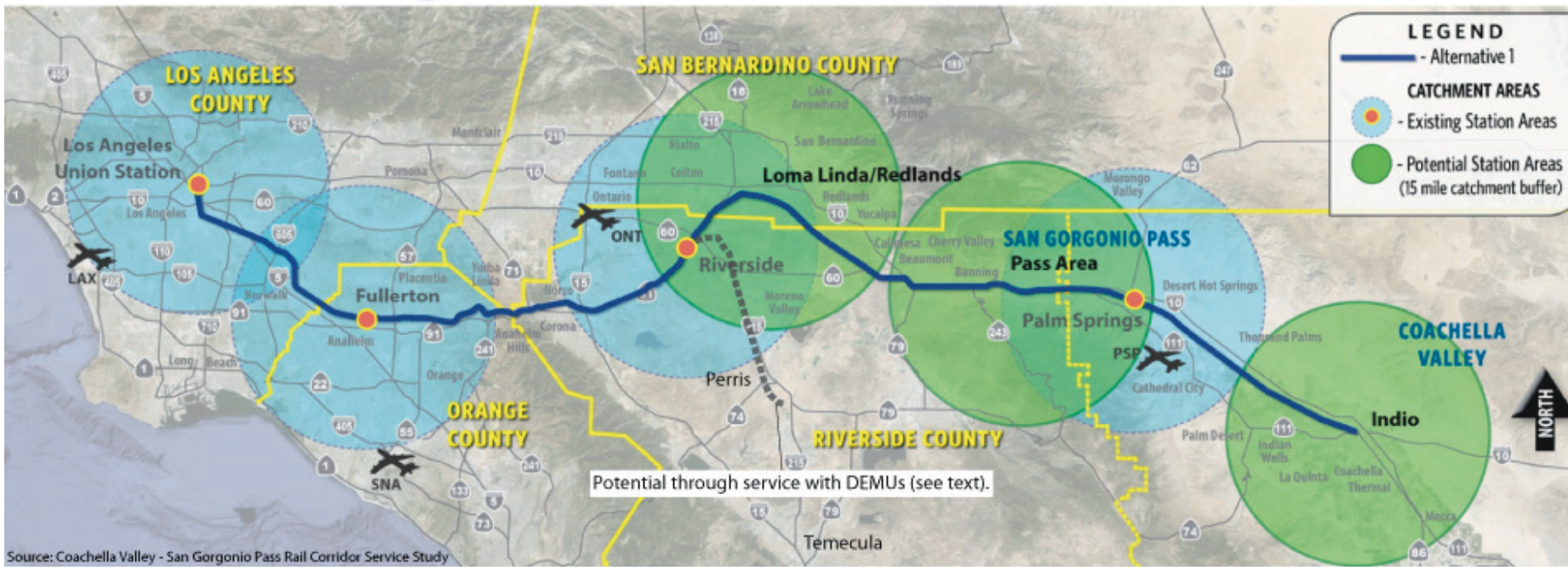
Not only does this CPUC rule no longer serve a purpose, it is a serious impediment to the level boarding required by the Americans with Disabilities Act (ADA). Because compliance with the rule requires an 18" gap between the car and station platforms higher than 8", level boarding requires expensive and useless adaptations, like gauntlet tracks, to keep freight trains away from the platform edge. To provide wheelchair access in lower-cost adaptations, various contraptions like bridge plates now have to be used to fill in this gap.

This rule makes it very difficult and expensive for California transit providers to offer level boarding. To encourge the growth of cost-effective rail transit, the CPUC needs to amend its regulations to reflect modern practice. Mandated clearances for station platforms 3' high or less should be reduced to 6' or 6' 6." This would allow new stations to be built with standardized platform heights of 17-18" to match the floor heights of our current double-deck fleet. As 21st Century designs are introduced such as modern DMUs–which typically have 24" high floors, that is, one step up from a 17-18" platform–accessibility would be much easier.

Incremental upgrades to 24" platforms can be made as older rolling stock is gradually retired, moving ever closer to 100% level boarding. None of this is possible if California does not change direction from its 70-year old, archaic steam railroad-era rules.

ATTACHMENT 9

Coachella Valley Trains Could Be Winners–With Better Plan



by Michael D. Setty
Editor, California Rail News

Recently, the Riverside County Transportation Commission (RCTC), in cooperation with Caltrans and the Federal Railroad Administration (FRA), completed a preliminary study of proposed rail passenger service between the Coachella Valley and Los Angeles via Riverside and San Bernardino Counties.

The preferred route would operate between Indio and Los Angeles Union Station with proposed intermediate stops in Rancho Mirage, Palm Springs, Cazabon (serving a large Indian casino and the Banning/Beaumont area), Loma Linda, downtown Riverside and Fullerton. Two daily round trips would be provided. Travel times would be about 3 hours, 15 minutes in each direction, averaging 39 mph over the preferred route. This is 30 to 60 minutes slower than driving, depending on time of day and day of the week.

Projected ridership in 2022 would be 189,000 annual passengers, or 520 per day and 130 per train. This would generate approximately $3.2 million in fares from about 16 million annual passenger- miles. Projected operating expenses of $14 million annually for 190,000 annual train-miles, or an estimate of 130 passengers per train. This means fares would cover 23%, with a net operating subsidy of about $10.8 million, e.g., a loss of about $58.00 per passenger and $0.68 per passenger-mile.

The conceptual operating plan envisions 6-car, 500-seat trainsets similar to current Pacific Surfliner equipment.

Despite Riverside County's strong advocacy for proposed Coachella Valley service, the poor projected performance raises serious concerns. Even with Amtrak's high costs, the Capitol Corridor and San Joaquins intercity corridors currently cover roughly 50% of their operating costs from fares and other operating revenues; the Pacific Surfliners recover about 70%.

For Riverside County, the RCTC's Coachella Valley rail proposal would come on top of the poor performance of the new Metrolink extension from Riverside to Perris that opened in 2016, which to-date carries only about 1/3 of the projected 4,000 daily riders, has a farebox recovery of less than 10%, and costs Riverside County taxpayers more than $10 million per year with a net operating subsidy of about $50 per ride.

As noted in another article in this issue of California Rail News, intercity passenger trains really cannot achieve ridership and financial success until they travel at average speeds matching driving times, e.g., at least 55 to 60 mph overall. As with other intercity services in California, 39 mph is far too slow to be competitive. Combined with infrequent service, this proposal cannot be successful.

A Fresh Perspective

In my estimation, successful intercity rail service to the Coachella Valley requires scrapping the current plan and approaching the problem from a fresh perspective.

First, selected rolling stock must match both likely demand and the characteristics of the proposed route. Six-car, 500-seat locomotive-hauled trains are far too large, too slow and underpowered for the relatively hilly route between the Coachella Valley, up and over San Gorgonio Pass, and the hilly portions of the BNSF line between Riverside, Fullerton and Los Angeles. Carrying 130 passengers on average aboard a 500-seat, $25 million+ train is something only an agency spending public funds could do. It simply is not cost-effective.

In a move greatly increasing options available for U.S. rail planners, pending FRA safety rules allow adaption of European and other overseas train designs to U.S. operations with only minor upgrades.

Based on this, modern Diesel Electric Multiple Units (DEMUs) are a much better choice than traditional locomotive- hauled trains. DEMUs are:

(1) Sized much more closely to the likely demand on the Indio-Los Angeles route, available in 125, 180 and 250 seat configurations;

(2) Are much lighter, more fuel efficient and cheaper to maintain. A 4-car, 250-seat unit weighs about the same as a 130-ton locomotive from a 550-ton, six car train;

(3) Being lighter, DEMUs have much better acceleration, speeding up service through quicker stops and faster speeds on hills; and

(4) DEMU trains can be made up of 2 or more separate units, which can join or divide at key junctions. This allows tailoring of train size to demand, and saves "slots" on busy mainlines over which the Coachella Valley route would operate.

Operating experience along both the Pacific Surfliner and Capitol Corridor shows that frequent service is essential to attracting sufficient ridership to justify the high costs of intercity rail passenger service. In the 1970's, doubling San Diegan (now Surfliner) service from 3 to 6 daily round trips more than tripled ridership. In the mid-1990's, doubling Capitol Corridor service also more than tripled ridership.

Based on this, 8-10 daily round trips between Indio and Los Angeles are recommended, with hourly peak service and two-hourly service at other times. This will require $100-$200 million in infrastructure to maintain existing freight train capacity for the Union Pacific and BNSF. More passing sidings and main trackage are needed, along with stations, and a layover facility in Indio.

A fleet of 8-10 leased DEMU trainsets could cover an expanded schedule for about the capital cost of 3 locomotive-hauled trainsets. The higher available horsepower per ton and better acceleration of DEMUs can probably increase average speed to at least 50-55 mph, reducing travel times by 20-30 minutes in each direction.

To lower labor costs, DEMUs serving the current low ridership Perris line could be coupled and decoupled at the Downtown Riverside station on DEMU trains to/from the Coachella Valley and Los Angeles. The current Perris line subsidy of $10 million+ annually may be sufficient for both routes, assuming operating expenses can be kept under the $20-$30 per train-mile typical of DEMU services in the U.S. and Europe.

Through-buses to Arizona, San Diego, Hemet-San Jacinto, Yuma, the Imperial Valley and the border at Mexicali would also add potential revenues, further improving the route's cost-effectiveness.

Michael D. Setty is a long-time advocate for rail service to the Coachella Valley.

ATTACHMENT 10

A VISION FOR PASSENGER RAIL IN THE

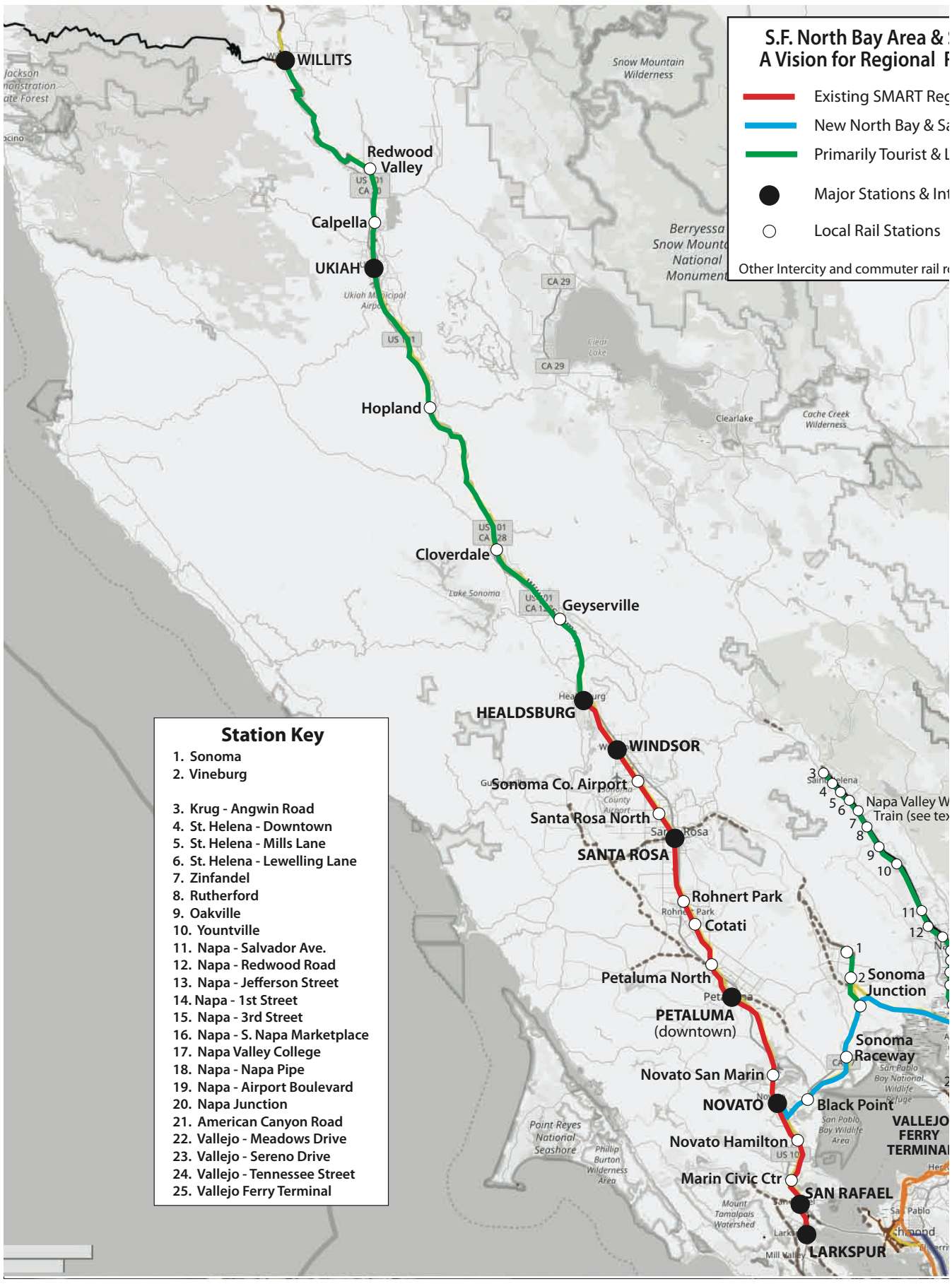
By Michael D. Setty
Editor, California Rail News

In addition to ideas for improving the Altamont Commuter Express (ACE) and San Joaquins proposed by TRAC in the previous California Rail News, passage of the SB-1 transportation funding measure opens up many options for improving and expanding rail passenger service throughout California.

SB-1 raised gas taxes and registration fees for improved highway and street maintenance, as well as more funding for transit capital and operations, intercity rail, pedestrian and bicycle projects.

With SMART service beginning in August 2017 between San Rafael and Santa Rosa, this is an opportune time to examine potential future improvements in the North Bay.

The Sacramento Area Council of Governments (SACOG) also recently began a study of proposed light rail transit (LRT) parallel to I-80 between Sacramento and Davis at the behest of Yolo County interests. With the proposed increase of San Joaquin service to the Sacramento region, looking at additional improvements in the Sacramento region is also warranted.



Upgrading & Extending SMART

Now that SMART service has successfully launched, its startup experience can be evaluated and viable improvements identified. In our view, SMART's current shortcomings include the following:

- An inability to hire enough operating personnel has left significant gaps in its peak hour service, harming both its usefulness and its ridership.
- No significant midday service between 10:00 a.m. and 3:00 p.m. or evening service. The unexpected weekend ridership success with only four round trips demonstrates a strong market for midday, evening and additional weekend service.
- Full trains on selected peak period schedules demonstrate the need for obtaining full 3-car trains within a few years. However, even with 4 additional cars, the total fleet of 18 cars will quickly limit capacity and ridership within a few years.
- Poor schedule coordination, and a lack of connections between SMART and existing bus services. For example, Golden Gate Transit buses leave San Rafael Transit Center too soon to allow convenient connections from arriving SMART trains. Similarly, while the SMART station platform is only a block from the Petaluma Transit Center, a 3-block walk around a large fenced area is required to make bus–train connections.

SMART should commit to the following short term service goals:

- Providing consistent peak period service every 30 minutes in each direction between 5:00 a.m. and 9:00 a.m., and 3:00 p.m. to 8:00 p.m.
- Provide hourly service in the early morning, midday, evenings after 8:00 p.m. and hourly frequencies on weekends and holidays.
- In cooperation with Golden Gate Transit (GGT), fix the schedules to make timed transfers between SMART trains and buses to San Francisco and the East Bay in San Rafael work better.
- Once SMART is able to provide consistent 60-minute all-day service (every 30 minutes during weekday peaks) seven days per week, redundant GGT transit service can be reduced or eliminated with major cost savings.
- Extend SMART service to Windsor and Healdsburg using the existing mix of welded and jointed rail. The diminished ride quality and possibly lowered speeds for this section of track are an acceptable tradeoff for getting this service into operation as soon as possible. TRAC believes that attracting drivers to rail is far more important than eliminating the clickety-clack. Welded rail can be installed later.

As ridership grows, SMART should start planning for peak period service every 15 minutes, and midday service every 30 minutes Monday-Friday.

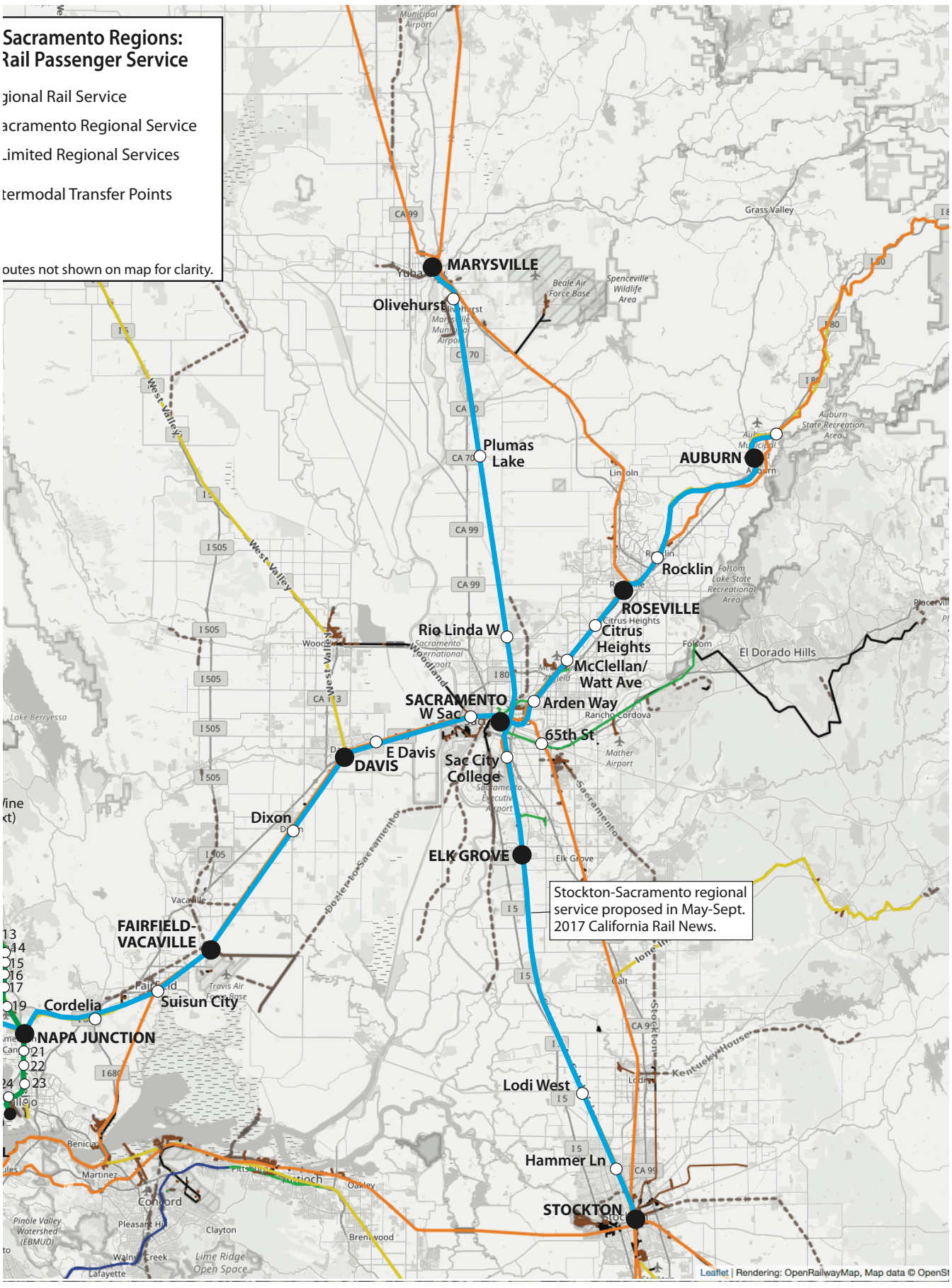
SMART will require significant capital expenditures for an expanded fleet and double track or new sidings in key areas. Study should begin on extending SMART to a location closer to the GGT ferries in Larkspur, including the possibility of a cross-platform transfer.

Other 101 Corridor Rail Services

While the original SMART plan included a 15-mile extension beyond Healdsburg to Cloverdale, this proposal is not cost-effective for less than 500 projected daily riders. However, a low-cost approach could make it feasible to extend passenger service to Cloverdale, Ukiah and Willits. For the anticipated volumes, upgrading existing tracks to 60 mph standards and adding modern signals would cost less than $150 million (excluding rolling stock).

The volume of Mendocino County tourists appears sufficient to support

E NORTH BAY & SACRAMENTO REGION



robust weekend and holiday service from the Bay Area, possibly via a public-private partnership. While weekday ridership potential is modest, it appears 5-6 daily round trips can be supported. This should be operated by modern lightweight Diesel Multiple Units (DMUs) that meet the latest Federal safety standards. These trains would make a cross-platform timed transfer to SMART's heavy DMUs at Healdsburg.

North Bay–Sacramento Rail Corridor

Typically, upgrading existing tracks to 60 mph standards costs less than $1 million/mile, and less than $2 million per mile including PTC. Contrary to recent Highway 37 studies, initial hourly rail service between Novato and the Suisun-Fairfield Capitol Corridor station would cost substantially less than $100 million, exclusive of rolling stock. This figure includes upgrading existing jointed track to 60 mph standards, PTC, more sidings simple stations with 17"-18" high platforms and allowances for bridge repairs. For another $200 million, new railroad bridges over the Petaluma and Napa Rivers could be included since their replacement is ultimately required.

Novato-Suisun service should also be extended to downtown Sacramento along the existing Capitol Corridor, to provide regional service covering the local stops not served by the Capitol Corridor, including East Vacaville (Elmira), Dixon, East Davis, and West Sacramento. Service could be further extended to Yuba City and Marysville, because light DMUs are cheap to run.

Davis to Sacramento light rail (LRT) is currently being studied, as noted above. This would require new tracks across the Yolo Bypass, because standard LRT cars cannot share mainline freight tracks as can the Capitol Corridor and DMU trains. In our view, there is not enough potential demand to justify the $500 million+ cost of LRT between Davis and downtown Sacramento. However, the Davis-Sacramento idea would fit nicely with Novato-Suisun service, and potentially provide some of the funding.

If additional Solano County rail capacity is needed to support this service, a 3rd exclusive passenger track–from the west end of the existing Yolo Bypass rail bridge to the Suisun/Fairfield station–would allow passenger service independent of Union Pacific (UP) freight trains and Capitol Corridor intercity trains. With careful scheduling, the Yolo Bypass railroad bridge has a capacity of more than 100 trains day, vs. 20-25 freight and 34 passenger trains operated at present. This project should be relatively cheap to build since few structures are needed. In the longer run, an exclusive passenger track across the Bypass is desirable but it will not be cost-effective in the next decade or so.

As demonstrated by Austin's Metro-rail, light DMUs can operate "in-street" over short distances. On-street operations from West Sacramento over the Tower Bridge, and along the L Street corridor connecting to proposed service along the UP Sacramento Subdivision through Midtown should be explored.

Light DMUs could also connect downtown Sacramento with Placer County along the 3rd Capitol Corridor track proposed to Roseville (with 4th track/passing sidings). This track could also be extended to Auburn, allowing frequent all-day regional rail service independent of UP freights along the I-80 corridor northeast of Sacramento. This plan would not preclude UP's usage of the 3rd track at night as a freight lead to its Roseville Yard.

Vallejo-Napa (Wine Train) Corridor

A large fraction of Napa Valley tourists also visit San Francisco in their Bay Area stays. While it is doubtful that ridership between Napa and Vallejo by local residents would cover operating costs, potentially large volumes of visitors accessing the Napa Valley via the San Francisco-Vallejo Ferry connection would put such service well into profitability assuming the low operating costs of lightweight DMUs. In Vallejo, there are tantalizing real estate opportunities that could offset rail capital costs. Timed transfers at an American Canyon station connecting the Napa Valley and the North Bay to Sacramento routes could generate heavy ridership and revenues. These are exciting possibilities for private investment.

Light DMUs get 2 mpg for 160 seats, vs. 1 mpg for SMART trains, and can operate "in street' over 1-2 miles. Wikipedia. By Michlaovic - Own work, Public Domain

ATTACHMENT 11

SF MAYOR'S RAILYARDS STUDY SIDETRACKS DTX

By Gerald Cauthen, PE
Former TRAC President

The most important Bay Area transit expansion to come along in over half a century is the extension of Caltrain (DTX) into downtown San Francisco. DTX consists of a 1.3 mile long tunnel from the existing 4th and King St. terminal of the 78-mile long Caltrain line to San Francisco's new Transbay Transit Center (TTC) at First and Mission. When completed, the new TTC/DTX connection will cause tens of thousands of Peninsula and San Francisco motorists to shift from car to train.

So, one might ask, "What is City Hall doing to advance the project"? So far as we can determine, nothing. On the contrary, instead of helping, members of Mayor Ed Lee's staff are holding DTX hostage while they sort out the future of Mission Bay, located in southeast San Francisco. This delaying action is embodied in what the Mayor calls the Railyards Alternative and I-280 Boulevard (RAB) Feasibility Study. The RAB Study appears to be a direct response to the demands of influential Mission Bay developers that the full and profitable build-out of Mission Bay take precedence over all other considerations.

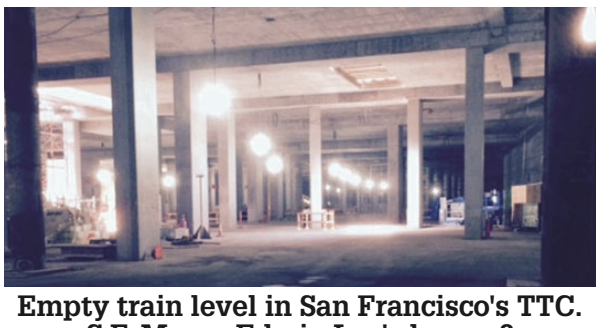
Transportation experts in San Francisco, Sacramento, Washington D.C. and elsewhere have long recognized the importance of DTX. When Caltrain finally arrives, it will be in the heart of San Francisco's 340,000 person employment center, within easy walking distance of tens of thousands of transit-oriented housing units. It will connect Caltrain and HSR to four BART lines, six Muni light rail lines and over 40 bus lines, thereby making the new TTC the most significant nexus of public transit systems in western North America. More importantly, it will significantly reduce the need to drive into and through San Francisco.

On November 9, 1999, the San Francisco voters weighed in. Recognizing the value of bringing passenger trains into the heart of the city, they voted overwhelmingly to approve Proposition H. Prop H called on City Government to give DTX its highest fund-raising and implementation priority and that it refrain from "taking any actions that would conflict with the extension."

The TTC will be complete and open for bus service in 2017. Yet if the RAB planners have their way, the space far below the TTC already created for the new train terminal will stand empty and waiting for trains for additional decades (see photo).

This is because in recent years San Francisco's City Hall politicians have unaccountably thumbed their noses at the Proposition H mandate to bring Caltrain (and

Gare du Nord, Paris
One of the world's great train stations



Empty train level in San Francisco's TTC.
S.F. Mayor Edwin Lee's legacy?

future high-speed rail) into downtown San Francisco. Here are seven destructive elements of Mayor Lee's ongoing RAB Study that are compounding the problem:

1. The Risk of Delay

Because of past SF City Hall support, the DTX project is currently first in line for Bay Area federal New Starts funding. But unfortunately, thanks to Mission Bay "planning", the DTX project is currently stalled while Lee Administration planners stew over grandiose but demonstrably impractical Mission Bay build-out alternatives. (The planners like to say that because Caltrain isn't as yet electrified they aren't holding up the project. This is false; if electrification funding falls through, it would still be possible to access the TTC using hybrid locomotives)

If DTX continues to be locally impeded in this way, it will sooner or later be knocked out of the New Starts running by a "ready-to-go" project in some other city. Current expectations are that, if the Mayor and his inexperienced Mission Bay planners persist, they will delay DTX by at least 25 years and increase the cost of getting Caltrain downtown by at least six billion dollars.

1. Transbay Transit Center
2. Temporary bus terminal
3. New bus ramps
4. Folsom Street
5. Transit Center District & Redevelopment Area
6. Downtown Rail Extension
7. Bus Storage
8. New Fourth & King Caltrain Station

2. Trip Times

The Mission Bay planners have repeatedly stated that their proposals would reduce train trip times. How? By how many seconds? And at what cost? The planners don't say.

3. Criticisms of TTC/DTX

The Mayor's Mission Bay planners have no experience in engineering design, passenger rail operations or construction cost estimating. Yet in the furtherance of their Mission Bay development goals, they often take gratuitous and usually incorrect public slaps at the TTC/DTX program. Such criticisms are not helpful.

4. Traffic Impact of Removing I-280

According to MTC, by 2035, over 250,000 automobiles will be entering San Francisco from the south every day, much of it on I-280. If the entire north end of I-280 is removed as SPUR and the Mayor's planners desire, what happens to all that traffic? How would it affect the Mission District? How would it affect Mission Bay? Again, the planners don't say.

5. Traffic Impact of the Arena

It is proposed that an Arena for the Golden State Warriors be placed east of Third and 16th Streets at the edge of the Bay (not shown on map). This idea is one that has been eagerly promoted by Mayor Lee and other local politicians. Project sponsors boast that the new Arena would play host to no fewer than 225 major events a year. If things go ahead as planned, each of these events would attract thousands of cars to Mission Bay, often during afternoon rush periods. Despite City Hall efforts to obfuscate the fact, this monumental squeeze would create massive new traffic jams and parking agonies in the South-of-Market and Mission Bay districts.

On January 8, 2016 the Mission Bay Alliance filed a lawsuit demanding that the Arena developers properly identify and mitigate the environmental impacts of their facility. Eight days later, the developers elected to put their project on hold for a year in order to give themselves time to deal with the environmental issues they had previously ignored.

6. Impact of Eliminating Caltrain's 4th and King Rail Yard

In accordance with the demands of Mission Bay developers that "there be no visible railroad tracks anywhere in Mission Bay", the Mayor's planners say they want to move Caltrain's existing San Francisco rail yard to some as yet undefined site to the south. This reveals an abysmal lack of understanding of passenger rail operations and the value of a train marshalling and storage yard located near the end of a train line. The staffs of Caltrain and the California High-Speed Rail Authority are understandably opposed to this idea. Mission Bay can be developed without the process undermining San Francisco's passenger rail connection to Silicon Valley and beyond.

S.F. Mayor's Freeway Replacement?

7. Impact of Relocating the 4th and King Station to Third Street

The long-established 4th and King Street Station is well served by three Muni light rail lines and at least 8 bus lines. Moreover it is strategically located to serve the South-of-Market area and Mission Bay District. Moving it a half a mile to an out-of-the-way location on Third Street where it would be less well served by Muni makes no sense.

Conclusion

DTX is the most important transit-integrating project to come along in the Bay Area since the original BART system was conceived in the 1950's. San Franciscans have been calling for the extension of Caltrain for decades. It's been over 16 years since the voters of San Francisco voted 69.3% for Proposition H.

San Francisco's Mayor and Board of Supervisors should immediately begin conforming to the priorities established in Proposition H. They should be leading the effort to ensure that DTX is funded and built without further delay. If City Hall gets behind DTX, the Caltrain trains could be up and running in the new TTC by 2024.

What You Can Do

Contact the San Francisco's Mayors office (415 554-6141, mayoredwinlee@sfgov.org) and Board of Supervisors (415 554 5184, board.of.supervisors@sfgov.com). Demand they honor the mandate of the people of San Francisco as expressed in Prop H in 1999 by completing the DTX Project without further delay.

Gerald Cauthen, PE and Transportation Consultant, is the co-founder of San Francisco Tomorrow, SaveMuni and the Bay Area Transportation Working Group.

ATTACHMENT 12

Metro: Transit Provider or Developer? -- LA Union Station Quandary

By Susan MacAdams
TRAC Board Member

Los Angeles Union Station, one of the great train stations in America, is undergoing a hugely ambitious redevelopment scheme called "LINK US," formerly known as "The Union Station Master Plan" and the "Southern California Regional Interconnector Project" or SCRIP. This project is intended to expand station capacity to handle much larger passenger volumes. First, to improve passenger access to the tracks, it would reconfigure access, adding a large amount of retail development under the tracks; second, it would incorporate run-through tracks for Amtrak, Metrolink and high speed rail.

The Proposal

Currently the station is stub-ended; trains enter the station area to pick up and drop off passengers, then exit in the reverse direction. Run-through tracks would greatly increase the station's capacity by eliminating turn-around times. However, redevelopment appears to be the main goal of current LINK US plans. This plan would build a shiny steel and glass mall that clashes with Union Station's Spanish Colonial - Art Deco architecture.

Currently, Union Station has several garden courtyards that knit together outdoor space with the interior waiting room and ticketing areas. Placing the new addition under the tracks turns its back on the grandeur of this existing infrastructure. The total LINK US project's estimated cost of $2.2 billion dollars could be better spent by building two new light rail lines or adding more buses, or by just simply building bus shelters in the San Fernando Valley.

Los Angeles Union Station, view through Main Waiting Room to train boarding area.
Photo By Alan Weeks. Used with permission.

The Los Angeles Co. Metropolitan Transportation Authority (Metro) has not overhauled its bus system in more than 25 years, yet during that time has added more than 500 miles of rail lines. When the rail lines were opened, the plans did not include adding local circulator buses to each rail or high-speed bus station. Many of the Metro buses run only once an hour. This greatly discourages ridership. As a result, the number of passengers using the buses has declined.

The original run-through track project more than ten years ago called for an extension of three tracks. Current plans would demolish all

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LA Union Station

(continued from Page One)

Union Station platforms and rebuild them fifteen feet higher to create a retail opportunity. The years of demolition and construction would make Amtrak and Metrolink service just about unusable for passengers. After construction, the retail and food concourse would become an unpleasant obstacle course with dust, vibration, and excessive noise from the trains traveling directly overhead.

There are many existing, underutilized spaces within Union Station better suited to retail and food services, including the former ticketing concourse at the front of the terminal. The oversized Amtrak baggage handling room immediately north of the boarding area could be relocated to less valuable space. The double doors of this room open onto a shaded courtyard, also underutilized. This location is ideal for a brew pub, upscale restaurant, or food court, but is not being considered in the new plans, even though it could literally save billions, and preserve functionality for passengers.

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At Union Station today is a large Amtrak baggage handling room that is underutilized. The double doors of this room open onto a shaded courtyard, also underutilized. This location is ideal for a brew pub or upscale restaurant but is not being considered in the new plans.

The LINK US study also seems to disregard the needs of the many senior travelers and those with disabilities who use Union Station. These riders us motorized shuttles that require ramps. When raising the tracks 15 feet, all ramps would be demolished and not replaced. The number of steps passengers need to climb would increase from 25 to 50 steps! This formidable increase would slow passenger flow and probably not comply with the ADA.

A local example of excellent railway station preservation and adaptive reuse is the former Pasadena Santa Fe Railway depot. The old waiting room is a now a trendy restaurant and the baggage room is a upscale pizzeria. The oversized windows of the baggage room originally served horse-drawn carriages. They were cost-effectively reused, with period-correct screens and wooden shutters that close at night. The depot's interior features the original custom-made chandeliers and rare Batchelder tiles. This is an excellent example of sensitive and efficient preservation when planning new construction at historic Union Station.

Safety Concerns

Raising the platforms by fifteen feet also creates serious safety issues: platform tracks would be higher than the mainline tracks. This violates a fundamental principle of railyard design; runaway trains from the station become a risk, potentially causing major accidents on the mainline freight and passenger routes along the Los Angeles River.

This sort of accident occurred at Lac-Megantic, Canada, garnering international attention. Brakes were not properly set, allowing the train to roll down the grade and derail, with a great loss of life and property. There is a possibility that a passenger train could roll out of Union Station and collide with a freight train carrying hazardous materials along the mainline tracks. Raising the tracks 15 feet to add a new passenger concourse underneath does not sufficiently consider safety.

It also does not take into account the extensive special trackwork (a complex arrangement of switches) that surrounds Union Station. This trackwork is some of the most exten-sive and unique on the West Coast. It must be built on basically flat ground to be kept operational.

If the tracks are raised 15 feet in the station, the tracks along the LA River must be raised even higher, to prevent runaway trains. That would require tearing down several historic bridges that cross the river and rebuilding them higher. That would mean the profile of several of the busiest of streets of Los Angeles would have to be raised, affecting utilities, sidewalks and storefronts.

Conclusion

The Metro Board has approved spending over $70 million to study LINK US, of which $25 million has already been spent. Despite the fact that these concerns have been made clear to both staff and the Board, project planning continues unaffected. Clearly, Metro is not listening.

The LINK US project should be revised to eliminate the new retail concourse, and focus on the much-needed run-through tracks. The original 1933 Union Station design included plans for expanding passenger access to the train plat-forms: two new tunnels could be built parallel to and on either side of the now-main corridor.

Adding these tunnels would allow for a significant increase in passenger volumes, at a very economical cost compared to the $2.2 billion mega-project being considered.

Canceling station redevelopment would allow funding for adding circulator buses at train stops and building bus shelters throughout Los Angeles County. Although real estate interests would not be happy, this course of action would be much more beneficial to the taxpaying public.

Susan MacAdams is a TRAC Board Member, a Los Angeles Union Station Historical Society Board Member, and former High-Speed Rail Planning Manager for Metro, where she had extensive responsibilities for Union Station.

ATTACHMENT 13

GERMANY, TRACTION & ROLLING STOCK, TECHNOLOGY, EUROPE, PASSENGER

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Hydrogen could replace diesel in 15 years says LNVG, as fuel cell train contract signed

09 Nov 2017

GERMANY: 'Fuel cell technology has a good chance to prevail in Germany in the next 10 to 15 years, with diesel vehicles being more and more forced out of the market', said Niedersachsen transport authority LNVG when it signed a 30-year contract with Alstom and gas supplier Linde Group for the delivery, maintenance and fuelling of 14 Coradia iLint hydrogen-fuelled multiple-units.

'The use of hydrogen for rail vehicles is a milestone in the application of fuel cells for emission-free transport', said Linde board member Bernd Eulitz at the ceremony in Wolfsburg on November 9. 'For the first time, the coupling of this sector to hydrogen infrastructure will be realised with a significant scope and in an economically viable manner. This development will push the establishment of a hydrogen society and will create new solutions for the storage and transport of energy.'

The iLint multiple-units are to be built at Alstom's Salzgitter plant, and will be leased by LNVG to its contracted train operator for use on Elbe-Weser services between Cuxhaven, Bremerhaven, Bremervörde and Buxtehude. The existing two-car prototype unit and a second unit are scheduled to enter service in spring 2018, with the rest of the fleet scheduled to replace diesel multiple-units from December 2021.

The trains will be maintained at an existing depot in Bremervörde where Linde will build a hydrogen fuelling point, with the estimated €10m cost funded by the federal government. The on-site production of hydrogen by electrolysis and wind energy is planned for a later phase of the project.

According to Alstom, the Coradia iLint will be able to operate at speeds up to 140 km/h and cover a distance of up to 1 000 km between refuelling.

The contract 'represents a real breakthrough in rail transport and a big step change towards a clean mobility system', said Alstom's Senior Vice-President, Europe, Gian Luca Erbacci. 'For the first time worldwide, a hydrogen-fuelled passenger regional train will replace diesel trains, generating zero emissions with the same performance as a regular regional train'

The *Land* of Niedersachsen is providing €81·3m for the project. 'From now on there will be a real alternative to diesel trains for non-electrified rail transport', said Niedersachsen Economy & Transport Minister Olaf Lies at the signing event. 'Hydrogen and fuel cells are an ideal combination for climate protection as well as for the energy and transport revolution. They allow the storage of energy and emission-free travelling on rail. We fund innovative technologies and make a sustainable contribution to the energy revolution in the transport sector.'

The Federal Ministry of Transport & Digital Infrastructure is contributing €8·4m from the National Innovation Programme for Hydrogen & Fuel Cell Technology.

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ATTACHMENT 14

theguardian

Low carbon battery-powered train carries first passengers

Five-week trial will see first battery locomotive operating on the UK rail network in more than 50 years, reports

Will Nichols for BusinessGreen part of the Guardian Environment Network

Tuesday 13 January 2015 09.38 EST

A new battery-powered train will pick up its first passengers this week, signalling that the days of noisy and polluting diesel engines may soon be a thing of the past.

Following successful trials of a prototype at test tracks in Derby and Leicestershire last year, the modified Class 379 Electrostar battery-powered train - also known as an Independently Powered Electric Multiple Unit (IPEMU) - will run a weekday service for five weeks between Harwich International and Manningtree stations in Essex.

The IPEMU, which has been emblazoned with 'Batteries Included' livery, is the first battery-powered train to run on the UK's rail network in more than half a century.

Network Rail said it will contribute to the company's goal of reducing its environmental impact, improving sustainability and reducing the cost of running the railway by 20% over the next five years.

Should the trial prove successful, a fleet of battery-powered trains could be seen across the network, potentially providing a cost-effective and zero emission replacement for the diesel engines that are still commonly used on branch lines.

"We are always looking for ways to reduce the cost of running the railway and make it greener too," said Network Rail principal engineer James Ambrose.

“This project has the potential to contribute significantly towards both those goals.”

Battery locomotives have actually been around for a century, although they have rarely been used to carry passengers. Munitions factories during world war one used battery power to avoid the risk of explosion from sparks emitted by steam locomotives, while London Underground currently has a fleet of battery locomotives used on engineering trains when the power is switched off for track maintenance and improvement work.

This article was amended on Wednesday, 14 January to change National Rail to Network Rail to correct an error in the article.

Topics

- Travel and transport
- Guardian Environment Network