



A MID-LIFE CRISIS FOR REGIONAL RAIL

Fifty Years After BART: What's Next
for Regional Rail?

SPUR REPORT

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The primary author of this report was Jake Cummings, SPUR intern
with assistance from Jeff Tumlin, Chi-Hsin Shao, Anne Halsted, Peter Mezey, Gillian Gillett, Hans
Korve, Stuart Cohen, Brian Stokle, Val Menotti, Brian Stokle, Dave Snyder, Gabriel Metcalf, and Egon
Terplan

San Francisco Planning + Urban Research Association
654 Mission St., San Francisco, California 94105
www.spur.org

INDEX

Index	2
Introduction	3
Planning for the Next 50 Years	5
SPUR Recommendations	8
Recommendation #1: Increase Capacity in the Urban Core	10
BART Early Action Items	10
Muni Early Action Items	13
Mid-Term Actions (After 2030)	17
Recommendation #2: Provide Fast and Frequent Service for Regional Trips, Especially for Commuters	20
Peninsula Early Action Items	20
East Bay Early Action Items	21
North Bay Early Action Items	23
Mid-Term Action Items (By 2030)	23
Recommendation #3: Improve Intercity Train Travel	24
Capitol Corridor Early Action Items (by 2020)	24
Altamont Corridor Early Action Items (by 2020)	24
Mid-Term Action Items (By 2030)	25
Recommendation #4: Match Land Use to Rail Service	25
Mid-Term Action Items (by 2030)	26
Recommendation #5: Improve Governance and Funding	26
Conclusion	28
Appendix A: Rail in the Bay Area Today	29

INTRODUCTION

In 1957, San Francisco Bay Area planners took the first major step in transforming regional transportation as they knew it. Faced with a postwar boom in car ownership and traffic congestion, a 26-member commission released the 1957 Rail Plan for the Bay Area. It was the first such comprehensive, long-range plan the Bay Area had ever seen, laying out a vision for regional passenger rail 50 years hence. The plan envisioned a state-of-the-art rapid transit system, on all new rights-of-way, that would encircle the entire Bay, cross over it on all available bridges, and travel deep beneath it in a tube constructed on the Bay's floor.

Replacing the hodgepodge of aging, privately owned rail companies, this publicly-financed system would serve all the major population centers in the five innermost counties and potentially would extend as far as Santa Rosa in the north, Brentwood and Livermore in the east, and Los Gatos in the south. Thus the Bay Area Rapid Transit system was born.

Fifty years later, only part of the original vision has been realized. The BART district, originally comprising five counties, was scaled down to three. Only one Bay crossing exists for passenger rail: BART's Transbay Tube. A new hodgepodge of publicly owned rail operations complementing BART has grown up along various preexisting rights-of-way. Bay Area regional rail remains a work in progress.

Even in its current form, our system of rail transportation plays a critical role in sustaining our economy and quality of life. Today more than half a million riders in the greater Bay Area board some form of rail transportation each day¹ as an alternative to using the region's crowded streets and freeways, which are consistently ranked among the most congested in the nation.²

And with current trends in economic and population growth, there is no plausible way to meet the region's transportation needs by investing in roads and highways alone.

There are certain advantages to investing in rail over alternative modes of transport in our main regional corridors. While the capital costs of rail are often high when compared to bus systems, the ability of trains to transport larger passenger volumes usually results in lower operating costs per passenger-mile once the infrastructure is in place. As rail lines are usually grade-separated, they offer a break from the snarls and vagaries of congested roads. A subtle but important advantage is that the train, following its tracks, rarely moves laterally — and when it does, it does so gently, never jostling passengers the way a bus changing lanes will. Even when the bus does offer competitive travel times and service levels, trip takers are more likely to opt for public transit over their car if it's a train and not a bus they are choosing.³

Finally, rail can be a catalyst like no other for transit-oriented development. Developers and other community participants view investments in rail infrastructure as solid commitments to serving the transportation needs of mixed-use, densely populated transit villages and transit-oriented job centers.

¹ *Metropolitan Transportation Commission, Statistical Summary of Bay Area Transit Operators, Fiscal Year 2006-2007.*

² *Texas Transportation Institute, Annual Urban Mobility Reports.*

³ *Vuchic, Vukan R. Urban Transit: Operations, Planning, and Economics. 2005. p. 589*

WHAT TYPES OF TRAINS MAKE UP OUR REGIONAL RAIL SYSTEM?

	Stop spacing	Frequency	Cars designed for	Technology
Light rail	Close (less than ½ mile)	High (every 10 minutes or less)	Fast boarding & high capacity	Electric
Urban metro	Close (½-2 miles)	High (every 10 minutes or less)	Fast boarding and high capacity	Electric
Regional commuter rail	Medium (2-10 miles)	Medium to high (15-30 minutes)	Fast boarding, comfortable seating	EMU's, DMU's, locomotive
Intercity rail	Fair	Low	Maximum comfort	EMU's, DMU's, locomotive

Source: This chart is modified from a version in the Bay Area Rail Plan.

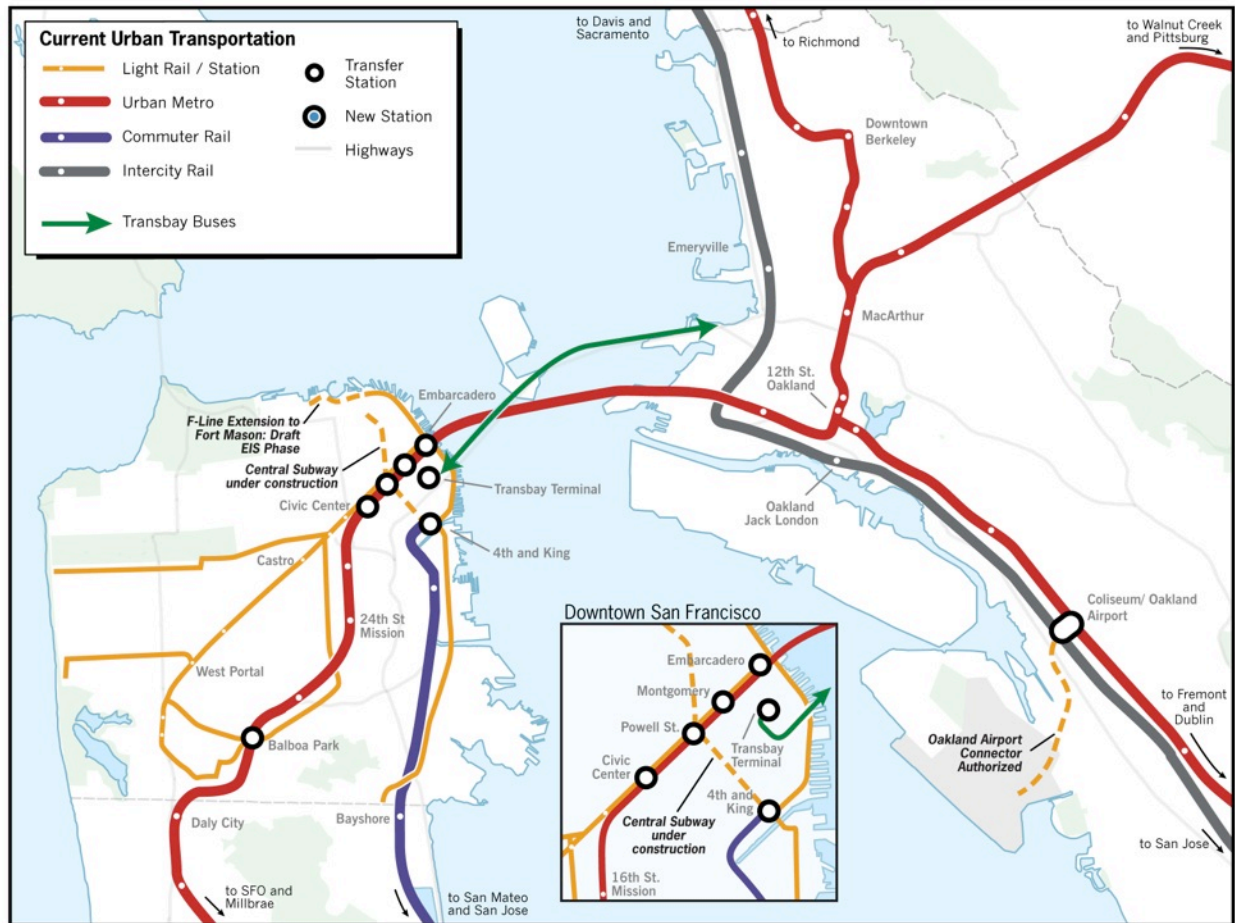
EMU's and DMU's ("electric" and "diesel multiple units," respectively) are trains propelled by small engines in every car, a very efficient and lightweight propulsion system. Locomotives are trains pulled by a single, dedicated engine car, sometimes electric but usually diesel.

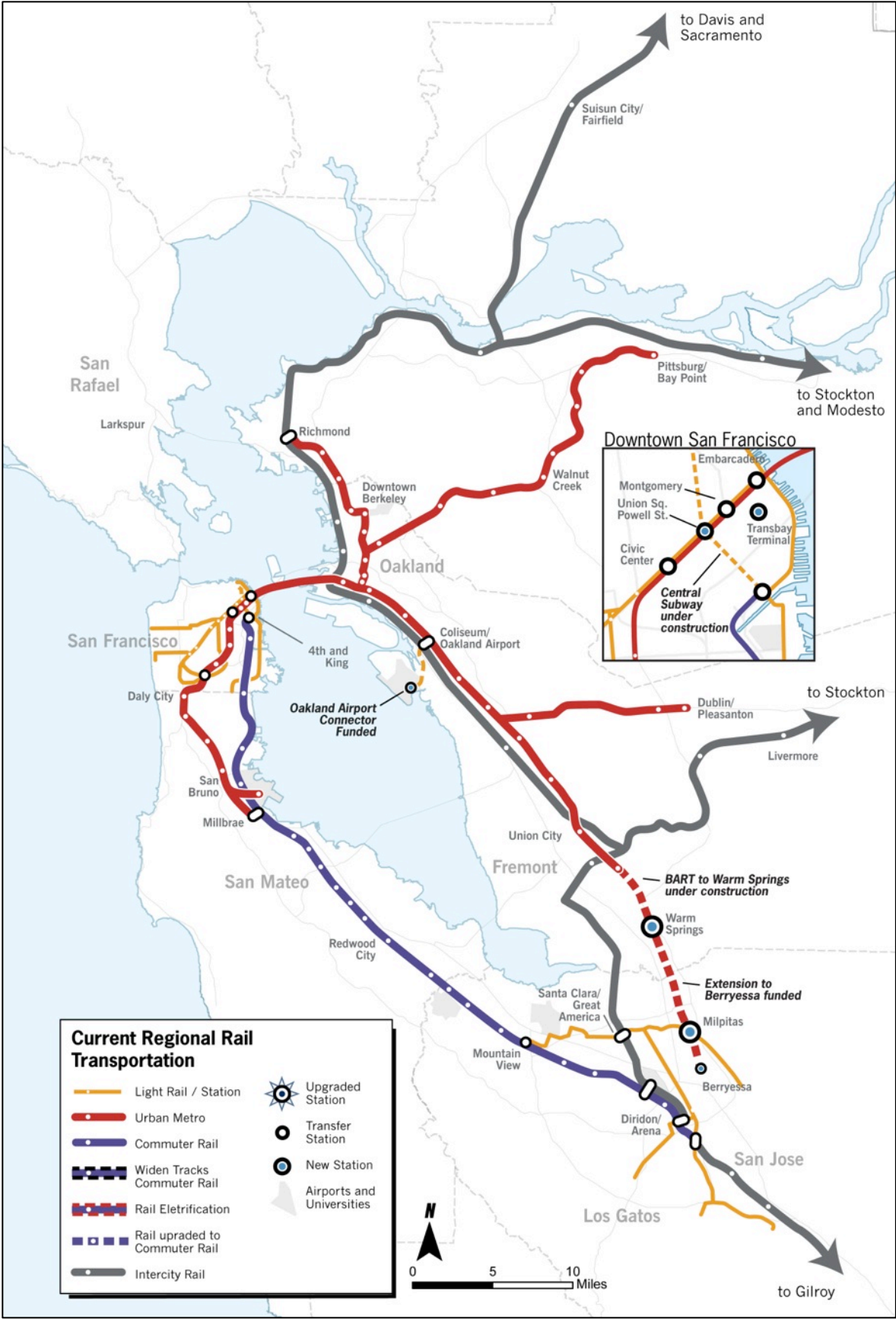
In September of 2007, a joint effort among the Metropolitan Transportation Commission, the Peninsula Joint Powers Board (which oversees Caltrain), the Bay Area Rapid Transit District and the California High-Speed Rail Authority produced a long-range Regional Rail Plan. Fittingly, the Regional Rail Plan of 2007 lays out a 50-year vision for passenger rail just as the original plan did 50 years earlier. The rail system of 2057, as envisioned in the plan, would include a completed BART network extending into Santa Clara County and eastern Contra Costa County, new rail lines in some of the outer reaches of the Bay Area, beefed up service on existing systems such as Caltrain, the advent of a high speed train entering the region from the Central Valley and Southern California, and a number of other improvements.

While the official Regional Rail Plan envisions an ambitious expansion of our rail transit network, it does not provide much detailed guidance in its prioritization of improvements. Part of the reason for this is the very political nature of regional transportation investments. Policy makers from each Bay Area county understandably seek to maximize the investment in their communities. The regional rail plan did not attempt to resolve the debates among the cities and counties in the region, preferring to provide an overall strategic context and defer key decisions about prioritization.

This SPUR report differs from the Regional Rail Plan in that it advocates more specific short-, medium- and long-term priorities. Furthermore, our comprehensive study includes the San Francisco Municipal Railway and the Valley Transportation Authority light rail systems, both intra-county systems that were not addressed in the Regional Rail Plan. Most importantly, this SPUR report is not constrained by Resolution 3434, a 2001 political compromise adopted by the Metropolitan Transportation Commission. This resolution promised MTC support for a \$10.5 billion (2001 estimate in 2001 dollars) "wish list" of rail expansion projects around the Bay Area, including some which most observers today doubt will ever be built. Resolution 3434 negotiated a settlement among competing Bay Area political leaders about rail expansion projects for their districts. It was a political deal, not a selection process based primarily on

objective cost-benefit metrics. This report is intended to spark debate about all rail expansion projects and their relative importance compared to other Bay Area transportation investments.





Planning for the Next 50 Years

SPUR has four overarching priorities for a more urban Bay Area that inform our recommendations for the regional rail system.

1. We need to preserve and build upon downtown San Francisco's success as a transit-oriented employment center by enabling significant job growth and increasing transit capacity.
2. We need to help other regional downtowns, such as Oakland and San Jose, enjoy similar transit-oriented success.
3. We need to support the growth of employment nodes on or adjacent to regional rail stations throughout the Bay Area — such as the Concord and Walnut Creek BART stops in the East Bay or the Sunnyvale and Mountain View Caltrain stations in the South Bay.
4. We need to strengthen the rail travel options that connect our region's city centers to each other and to major centers across the state.

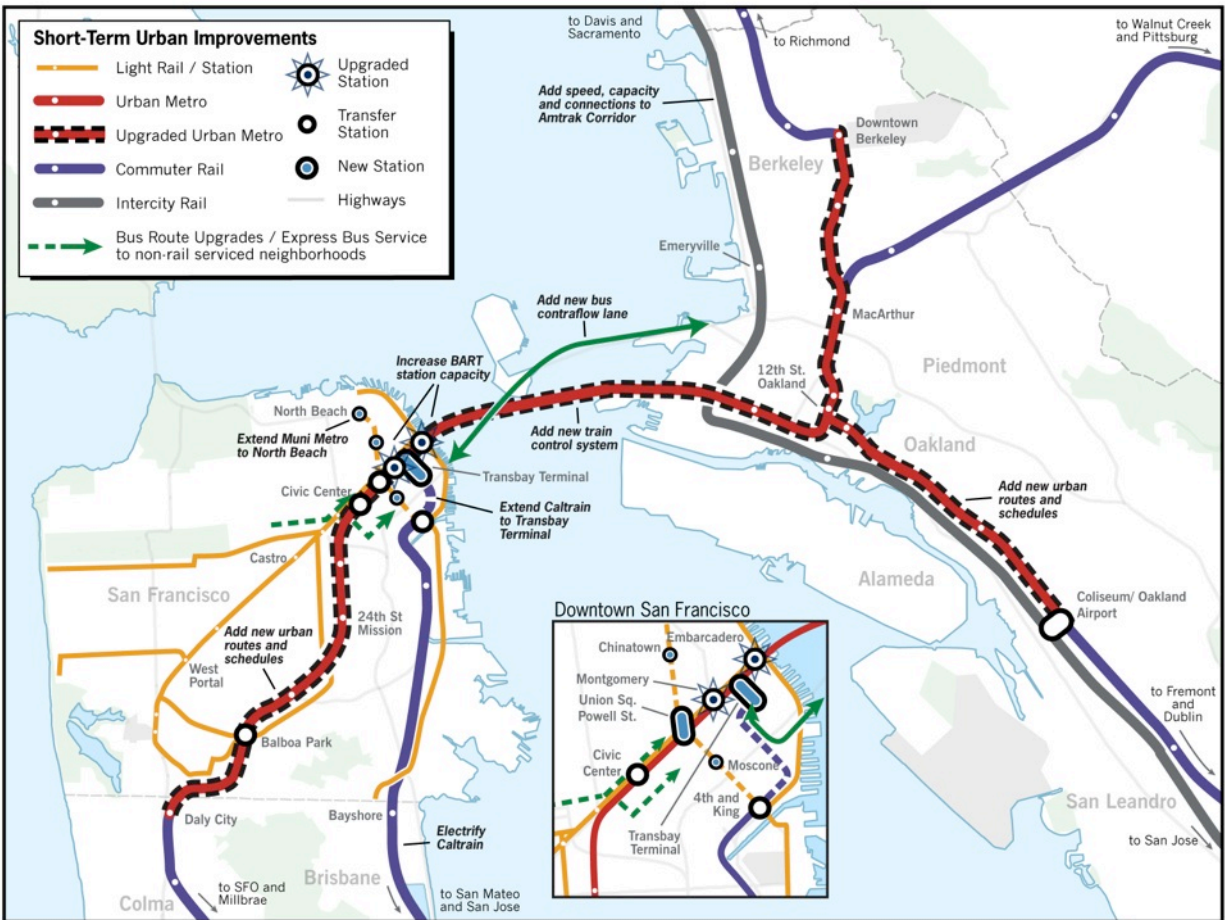
These priorities would represent a significant shift in the recent historical geography of employment in the Bay Area. Too often we have seen job growth in office parks three or more miles from our regional rail — a distance that for nearly all employees is too great for them to make use of the regional rail in their trip to work.

Regional travel planning agencies recognize the importance of shifting our growth patterns. For the update of its regional growth targets, the Association of Bay Area Governments is projecting significant increases in jobs into existing city centers, including San Francisco: an increase of 100,000 more jobs than the prior projection (which already projected more than 250,000 new jobs in San Francisco in less than 20 years). ABAG believes in using projections to help measure performance toward a set of targets with a timeline ending in 2035, including the reduction of carbon dioxide emissions by 40 percent below 1990 levels; the reduction of the number of vehicle miles traveled per capita by 10 percent compared to today; a limit on regional greenfield development to 900 acres per year; and an increase in non-automobile dependent access to jobs and essential services by 20 percent compared to today.

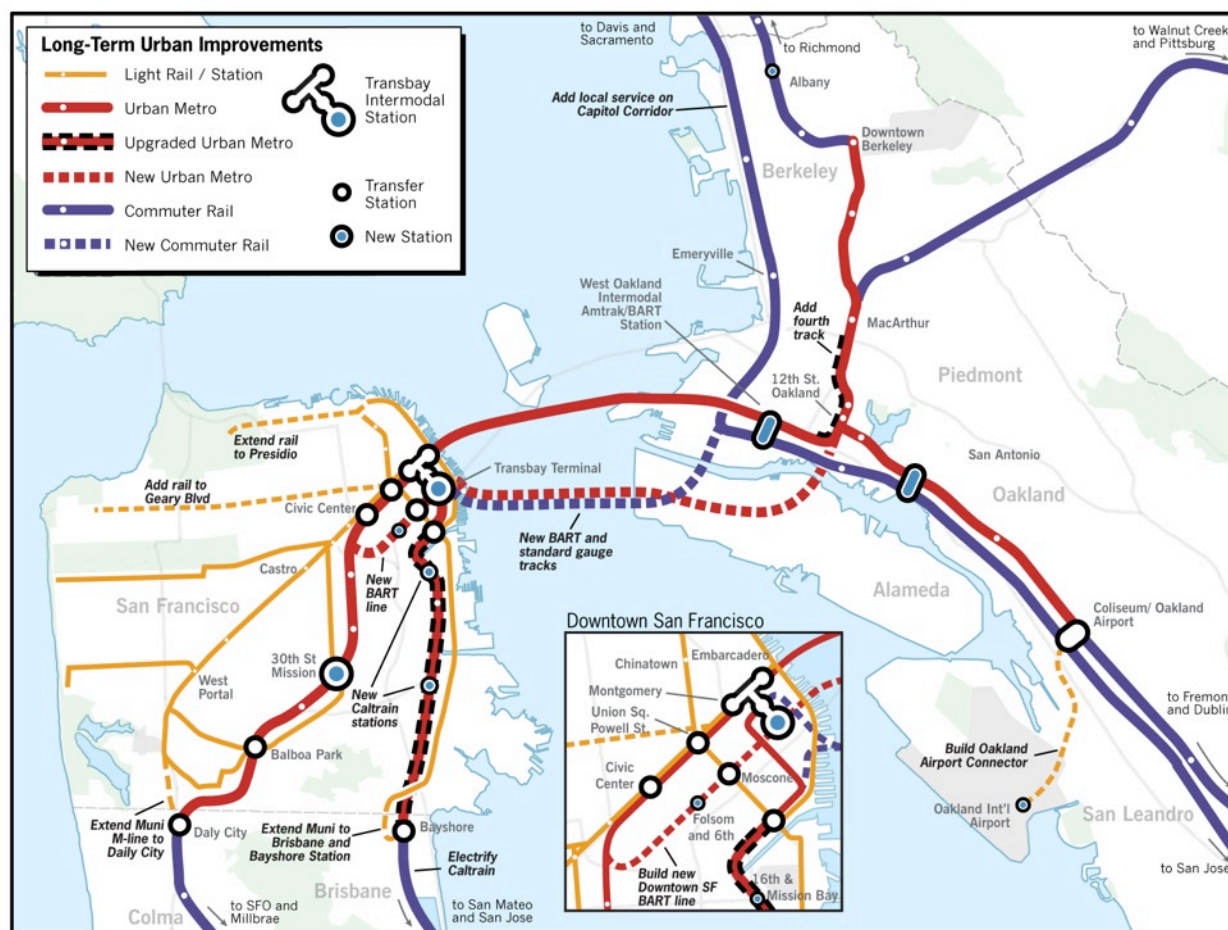
Providing high quality rail transit in the Bay Area will require some difficult decisions. The initial investment, however, is high — and public investment capital is limited. Considering the challenges, carefully choosing where to invest our limited dollars is very important. The Regional Transportation Plan, the Bay Area's official blueprint for transportation spending, projects the region should spend \$73 billion in the next 25 years, most of it on basic maintenance, but only identifies \$49 billion in likely funding over that span of time. None of that funding is for increasing capacity in the system.

This paper seeks to answer several questions: Which rail expansions are the most likely to deliver the system that promotes strong city centers and most reduces vehicle miles traveled? Which are the improvements we must make now, and which can we realistically defer for some years?

Most importantly, this paper will steer SPUR's advocacy efforts to garner the additional funds to build the most vital and important projects sooner rather than later.



SPUR recommends for the downtown portions of Market and Mission Streets to be transformed into a stronger transit-first corridor. The first step would be to increase capacity at the Embarcadero and Montgomery BART stations. (See the chart on page 7 for the key to specific improvements indicated on this map).



In the long term, we envision a diverse network of trains serving both San Francisco and Oakland. New light rail in San Francisco would improve links to regional transit. Metro-style service along the Caltrain corridor would serve in the Eastern Neighborhoods, while a new transbay tube would provide a continuous route from the Peninsula to Sacramento.

Recommending priorities in the development of an ideal regional rail system is incredibly complicated. The appropriate expansion on one part of the system depends greatly on what happens in another part of the system. For example, if the California High Speed Rail Authority invests early in the Altamont corridor, then the Dumbarton Bridge and the East Bay Amtrak corridor become more important, and the Capitol corridor connection to Sacramento becomes less important.

It is less complicated to make recommendations for the short term. Very significant benefits will accrue to Bay Area travelers and the regional economy if we do take quick action on some projects, while very specific crises await if we fail to act quickly in some cases.

SPUR's recommendations therefore emphasize early action items, those things we should do now. By now, we mean within about ten years, or by 2020. Other actions are listed as Mid-term, usually by 2030, and long-term, usually by 2050. The goals behind SPUR's recommendations are as follows:

1. **Sufficient capacity in the urban core.** We can't continue to support job growth in the downtowns of San Francisco, Oakland, and San Jose without ensuring the rail systems can carry the projected number of passengers.

2. **Fast and frequent service for regional trips.** A passenger should be able to travel between any major job or residential center in the Bay Area to any other with no more than one transfer, and in an amount of time comparable to the automobile.
3. **Convenient intercity connections.** Bay Area residents need easy connections between the major population centers of the Bay Area and those in our megaregion — Sacramento and the Central Valley — and beyond. Trains should use the most direct possible routes, and run as fast as modern, if conventional, technology will permit.
4. **Land use that takes advantage of rail service, and vice versa.** Rail is a great investment wherever land uses already support it (including most notable the neighborhoods where streetcar tracks were removed) and we prioritize new rail service there. Conversely, it's in our interest to incentivize greater densities where major public rail investments already exist.
5. **Governance that delivers the funding and coordination that supports these goals.** It is tempting to propose new governmental structures that, on paper, will deliver the authority and coordination of the rail service we need. However, SPUR believes it is preferable to emphasize the goals of governance, and give the existing authorities the opportunity to achieve those goals before rewriting charters and creating new institutions.

RECOMMENDATION #1: INCREASE CAPACITY IN THE URBAN CORE

Two rail systems in the Bay Area are suffering significant capacity constraints: BART and Muni. BART's constraints are a matter of infrastructure: the system physically cannot handle the number of passengers it is expected to attract in the near future. Muni's are more operational: severe inefficiencies caused in part by very slow speeds combined with chronic budget deficits have resulted in too many people squeezing into too few vehicles. SPUR's recommendations to address these capacity constraints are grouped separately.

BART's problem is centered on the heart of its system within and between San Francisco and Oakland. All five BART lines feed downtown Oakland; four of the five traverse downtown San Francisco. The capacity of the urban core facilities limits prospective increases in service across the entire BART system. These capacity limits, most acutely felt during peak hours, can occur at various points in the system. For example, the San Francisco Montgomery and Embarcadero stations' ability to circulate riders between the platform and street level are near their limits. The speed with which riders can board BART cars constrains the frequency of trains operating in high traffic areas. And even once these problems are addressed, the Transbay Tube connecting San Francisco and Oakland ultimately will be inadequate to handle the number of trains needed to meet demand for transbay trips.

BART Early Action Items

BART must take quick action to increase capacity in its existing urban core. SPUR recommends the following actions:

Increase BART station capacity, especially at Montgomery and Embarcadero

The Montgomery and Embarcadero stations need more vertical circulation capacity immediately. BART should undertake a comprehensive study that examines the costs and benefits of various improvements, such as:

- operating faster escalators

- installing fast, high capacity elevators
- Installing glass doors between the platform at the Embarcadero station, where the platform is narrower than other stations, to permit more people to safely pack onto the platform.
- establishing direct platform-to-platform connections with the Muni Metro at the Civic Center station.

Increase express bus service and add a bus-only contraflow lane on the Bay Bridge

The Transbay Transit Center will have a capacity of 400 buses per hour when it is complete in 2012. Currently, AC Transit runs just 95 buses per hour. Quadrupling the express bus capacity across the Bay could provide significant relief to BART's capacity constraints.

Essential to the efficient operation of express buses is the addition of a bus-only lane in the westbound direction in the a.m. peak hour. This is because Caltrans frequently allows more cars onto the bridge than it can accommodate, causing delays that deter potential bus passengers and add millions of dollars in operating costs to AC Transit. Caltrans should implement a bus-only lane on the (otherwise eastbound) lower deck for westbound buses during the a.m. peak hours.

Increase BART train capacity

- Reconfigure existing cars for more capacity. BART has already undertaken an effort to modify the interiors of about half its fleet to allow for more standing space. These measures likely will be necessary for the other half of its fleet as well.
- Specify three-door cars in the next vehicle replacement purchase. Cars with more doors improve capacity in two ways. More doors reduce a train's "dwell time," the amount of time it takes to load and unload passengers. Cars with fewer seats are acceptable in the urban metro model, where most people use trains for short trips. (For longer trips, of course, seating capacity is paramount; see the sidebar on the challenge BART faces serving both the urban metro market and the suburban, longer-distance commuter market.)
- Install a new train control system. A new positive train control system, using GPS technology to help manage safe spacing between trains, would decrease the amount of time between trains, enabling BART to run trains two minutes apart in the tube. Current technology requires BART to leave a buffer of 2.5 minutes between trains. It would also cut down on energy consumption. It must be noted that running trains closer together increases the importance of our recommendation to facilitate fast boarding by increasing the number of doors on BART trains.
- Redesign routes and schedules. BART's current approach of scheduling long runs that traverse both urban and suburban markets is not necessarily the most efficient. BART should look for ways to enhance its productivity in the urban core while operating at frequencies in the outlying areas appropriate to the demand patterns in those respective areas.

Combined, these measures could increase BART's capacity to deliver passengers to downtown San Francisco by 25 percent. That's not enough for the long term, but it will probably accommodate the projected increase in transit mode share and the projected growth in jobs in downtown San Francisco for at least another decade.

However, the stations themselves cannot safely circulate 25 percent more passengers as currently configured. That's why we listed the station upgrades and transbay bus upgrades first. It also points to the

importance of the Muni recommendations listed next.⁴ Meeting internal trip demand in the Market and Mission corridors by Muni alone would reduce demand on the BART system.⁵

Extend BART to San Jose

In keeping with SPUR's call to strengthen the urban core, we also recommend the construction of the proposed BART extension to San Jose from the current terminus at Fremont. This is a controversial project among transit professionals, some of whom believe that the standard-gauge rail would offer faster service and better connections in the East Bay at less cost. However, the alternatives to BART do not provide a regional rail station in downtown San Jose as the proposed BART extension does. SPUR understands that high-rise commercial development in downtown San Jose is dependent upon the BART extension in the same way downtown San Francisco's success is reliant on BART.

A related proposal is the intensification of land uses at the stations along the extension. San Jose and the neighboring cities of Milpitas and Fremont must upzone to take advantage of this transit investment.

While the BART extension will provide access to downtown San Jose from the East Bay, and facilitate the development of downtown San Jose as a commercial center, it is still necessary to link the residents of the Tri-Valley to downtown San Jose with direct train service. For this purpose, SPUR recommends upgrades to the regional rail system — the existing Capitol Corridor and ACE corridors. See the regional rail section for details.

Finally, as BART is already at capacity in the existing urban core of San Francisco, it is critical that the capacity enhancements that SPUR recommends be implemented. Adding more passengers on BART in and near San Jose might cause the system to break down near San Francisco. The answer, of course, is not to turn away new markets such as San Jose; it is to recognize that these extensions will only work if there is simultaneous investment in the core of the system, as required by BART's system expansion criteria, which SPUR supports.

⁴ *It also points to the importance of SPUR's recommendations for larger stations in the Central Subway project, on which the City will soon begin construction.*

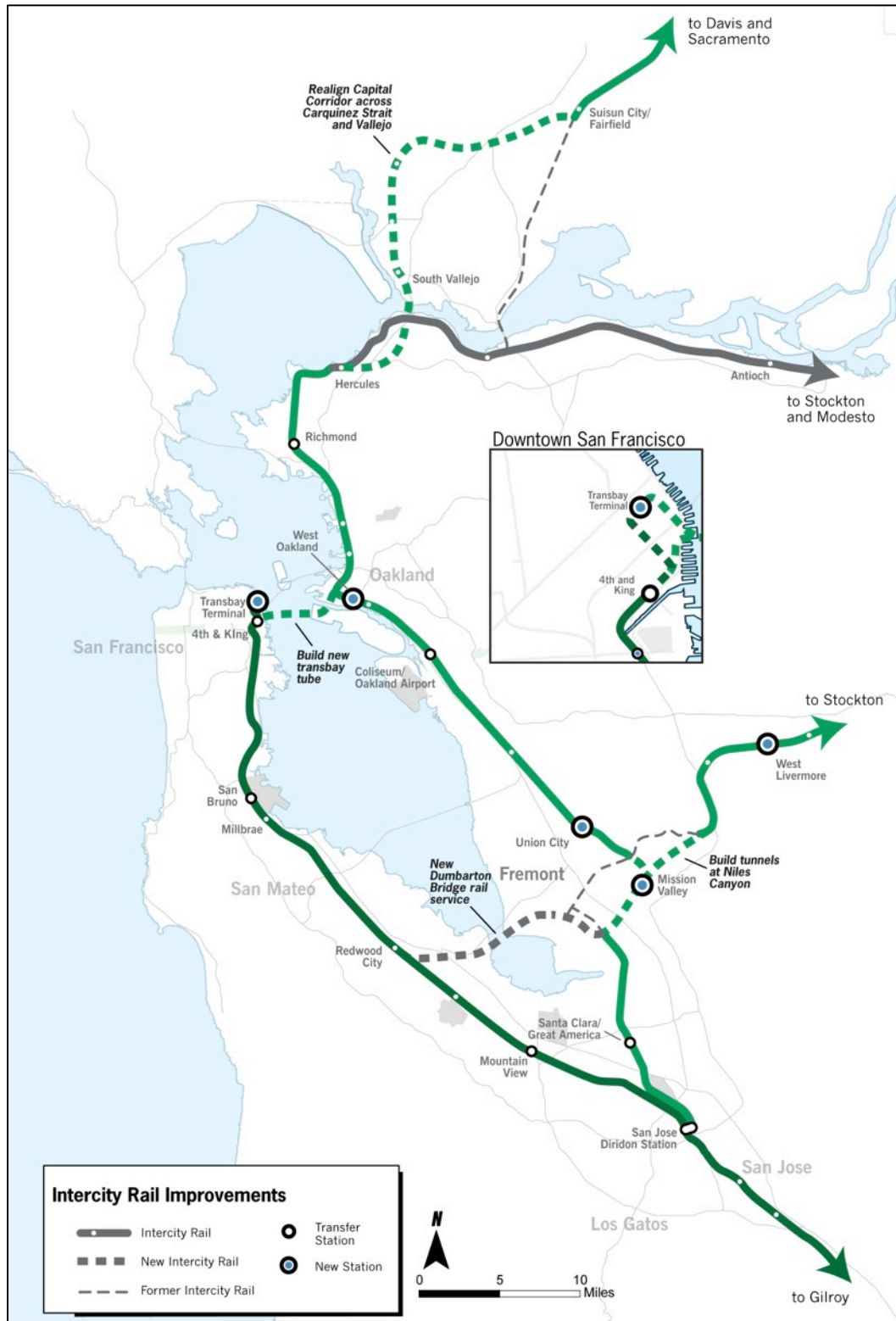
⁵ *The Transit Effectiveness Project transportation model predicts that faster service on Muni, including Mission and Market streets, will increase ridership on Muni by 9 percent and actually reduce ridership on BART.*



Fast intercity rail relies on new alignments: a new tube under the Bay, a new route through Vallejo, a replacement of the Dumbarton Rail Bridge in the south Bay and new tunnels through the Niles Canyon area. (See the chart on page 7 for the key to specific improvements indicated on this map).



With electrification, the use of lightweight trains and the addition of express tracks, standard gauge regional rail can be as fast as BART and cover greater distances in less time. While the Caltrain corridor is the first priority for conversion to fast, frequent service, the existing Amtrak alignment can supplement BART and help the East Bay grow into a more transit-oriented community.



In the long term, existing regional rail service would benefit from new connections to rail service throughout the Bay Area. Just about every community in the region would be connected to other communities by fast and frequent rail service — and trips requiring no more than one transfer.

Muni Early Action Items

As SPUR has documented extensively, Muni's average travel speeds and on-time performance are well below the national average, and unacceptable for a city that likes to pride itself as being "transit first." Although the Muni Metro light rail lines are only part of a system that includes extensive bus service, the issues plaguing the system as a whole are not fundamentally different between the bus and light rail portions. Muni needs a strategic vision to guide development into a system that will place it among the light rail networks internationally recognized for their excellence in design, construction, operation, and passenger convenience – model systems such as those found in Zurich, Paris, Vienna, Gothenburg and Stuttgart. These are crowded cities with affluent populations and many automobiles and drivers — yet they give their surface rail operations effective priority and operate and market them as an attractive service.

Promising — but very preliminary — steps toward reform are already underway. The Transit Effectiveness Project (TEP) undertaken by the SFMTA and Controller's office contains a set of recommendations aimed at speeding up average travel times and reliability across the Muni system. SPUR recommends that the highest priority be placed on implementing the recommendations of this initiative. A more effectively run Muni will translate to more ridership which in turn translates to more dollars available for much-needed expansion projects.

Fully implement TEP recommendations for faster service, especially on Market Street and Mission Street

Already well explicated in SPUR's recommendations for the Transit Effectiveness Project and in the TEP's own action plan, the following actions should be expedited, and applied to Mission and Market Streets first.

- Begin a thorough study of transit and bicycling improvements on the Market and Mission Street corridors. The recommendations from the Transportation Authority's Market Street study, approved in 2004, should be implemented immediately. The Municipal Transportation Agency should build upon those first steps with a thorough analysis of potential methods to speed up the buses and trains by 10-20%, and to provide a safe and protected bicycle path the length of Market Street.
- Implement Transit Preferential Street treatments. TPS treatments are enhancements and alterations made to streets that speed the flow of transit in places where transit shares a right-of-way with vehicle traffic. These measures, which include more physically separated transit lanes and transit preferential signaling, could be implemented on a number of lines at a relatively low cost.
- Phase out onboard fare collection for the rapid routes. A complete and effective operation of its Proof-of-Purchase system would install ticket vending machines at all stations and eliminate fare collection by the train operator, which delays train movement and distracts the operator.
- Consolidate stops that are in close proximity to one another. Many light rail stops are within a few blocks of each other, sometimes as little as one block. While this close spacing reduces the walking distance for many customers, it does so at a detriment to faster travel times for everyone else. Muni needs to manage this trade-off better by consolidating many of its stops.

Develop a Muni Metro Master Plan

Beyond the TEP, there is much the SFMTA could do to get more out of its urban streetcar system. SPUR recommends that the SFMTA develop a Muni Metro master plan that addresses the following issues, at least:

- Converting to low-floor vehicles. Muni is one of the last agencies still buying high-floor rail vehicles. A long-range plan needs to be developed for conversion of the system to low-floor operation — including coordination of the acquisition of new vehicles with a phased conversion of track, subway stations and surface stops to reduce dwell times and make the system 100% accessible for the disabled.
- Operating longer trains in the subway. Currently, the shortest platform on the line, which is often a very short, on-street platform, limits the maximum train length on the whole line. This is one of the reasons that Muni runs such short trains, even though that creates huge capacity problems and increases operating costs.

Extend Muni Central Subway to North Beach

Scheduled for completion in 2016, the Chinatown neighborhood of San Francisco finally will be connected to Muni's subway system. It makes eminent sense that Chinatown, a neighborhood with one of the highest population densities, lowest rates of car ownership, worst traffic flow problems, and slowest surface transit speeds, would be well-served by underground rail. Extending the existing T line from Fourth and Townsend north, the Central Subway project is officially slated to terminate in Chinatown for financial reasons. However, in light of the construction logistics, which will have tunnel-boring machines burrowing from South of Market northward through Chinatown, SPUR believes there is an enhancement opportunity here.

Additional funding — about \$200 million added to the \$1.4 billion project — should be secured for a station in the vicinity of Washington Square. The tunnel will not have to be lengthened much to accommodate a subway station, and the city should consider simply leaving the boring machines in the ground to put them back to work some years later when we have the funding to expand the subway even further. See SPUR's recommendations for long-term improvements for a discussion of the eventual extension of the Central Subway.

Mid-Term Actions (After 2030)

As noted, SPUR's recommendations for 2030 and beyond are necessarily speculative. The right actions could be very different depending on the actions taken in the next decade. Therefore, we are not listing the recommendations with indicative letters, as we do for the short-term actions.

1. Add rail to Geary Boulevard.

This recommendation could just as easily be placed in the "land use" section, as the lack of rail on Geary Boulevard represents the most severe case in the Bay Area of rail-supportive land use without rail.⁶ More passengers ride the 38-Geary every day than any other bus line in the West. Despite double-articulated vehicles and very short headways, overcrowding remains a problem at

⁶ SPUR has reviewed studies done for BART by Cambridge Systematics that analyzed the factors that make residents of a particular neighborhood inclined to take transit, and overlaid those results on a map of the Bay Area rail network. No other community in the Bay Area without rail was as transit-friendly as the Richmond District.

peak times. Furthermore, as the buses approach downtown, street space becomes scarce. Recognizing these factors, transportation planners have long recognized the Geary corridor as appropriate for a new Metro line, built on the surface between the Richmond District and Van Ness, with a section of subway between Van Ness and downtown.

Opponents concerned about the impact of light rail on Geary have delayed its implementation for years, however, prompting planners to recommend a compromise of sorts: Bus Rapid Transit. BRT is a good compromise: its large buses, exclusive right-of-way, and pre-paid boarding stations make the BRT operate like trains on rubber wheels, and the right-of-way can be converted to rail later on.

The details about converting to light rail on Geary are complicated and will delay the transition, and it may be that the BRT works so successfully that conversion to light rail is not a priority. If the future Geary light rail carries vehicles on the surface east of Van Ness in the older, narrower section of the street, it should wait until Muni has converted its fleet to low floor vehicles so that the imposing tall platforms are not necessary. Alternately, Geary's eastbound light rail vehicles could enter a tunnel just west of Van Ness, where the trains could continue under Geary to Union Square (where the Union Square Central Subway station is being built with the eventual Geary line in mind) or to south of Market in a new tunnel that crosses Market Street near Civic Center.

2. Expand rail capacity downtown.

As we noted, BART's urban core capacity is seriously constrained by the circulation capacity of the Montgomery and Embarcadero stations. It is also constrained by BART's inability to store disabled vehicles anywhere in the center of the system.⁷ Finally, it won't be long before the BART tunnel itself approaches its capacity limitations, although that will only be in the a.m. westbound direction. There are a variety of options to increase train capacity downtown, some of which are listed below. Some are mutually exclusive; some are prerequisites to others. SPUR cannot recommend any of these options without further study, but strongly recommends that the right mix of these actions be taken, and that BART, MTC, and the SFMTA cooperate on a study to determine the best long-term response to the capacity crisis in downtown San Francisco.

3. Build a Civic Center turnaround.

This would permit BART to run an urban core shuttle to serve the busiest section of the BART system without having to run trains all the way to the end of the line. It would also permit BART to store disabled trains without blocking the critical downtown subway.

4. Build a new BART line, or "loop," in SOMA.

This provides the benefits of more station capacity downtown. It can be a precursor to a new Transbay BART tube. The first project would be to create a new "Y" west of Civic Center Station and then route the tracks via the Folsom or Townsend Corridors. Once the loop is in place, BART service could be reorganized to make the most efficient use of four tracks in downtown San Francisco.

⁷ *In San Francisco, BART has a crossover track at 24th Street but no vehicle storage capacity in the city. It's one thing to have a disabled vehicle force single track operation in the outer ring of BART's system, but in downtown San Francisco this would produce a transit meltdown.*

5. **Build a new Transbay Tube.**

The next project would be to continue the loop to the entrance of a new Transbay Tube, probably at Pier 36/38,⁸ although the alignment must be the subject of a new study. The new tube should be designed as a four-track bore to accommodate both BART and standard-gauge rail, such as Caltrain or high speed service. The San Francisco connection to the tube should be designed with track connections to the Caltrain/High Speed level of the Transbay Transit Center's rail level. The Oakland connection to this tube will also need to provide East Bay connections to the BART network.

6. **Connect the Transbay Transit Center to BART with an underground walkway or people mover.**

The Transbay Transit Center will be the biggest transit hub west of Chicago. Just one block away from the existing BART line on Market Street, its utility will be vastly enhanced with a direct connection to the BART platforms under Market Street. The connection would enable passengers to travel from the ticketing level of BART to the ticketing level of the Transbay Transit Center's train station, without having to go up to the surface and back down again.

7. **Build the fourth BART track through Downtown Oakland, and upgrade the Oakland "Y."**

In the BART subway that runs through downtown Oakland, there are separate tracks for north and eastbound trains, while west and southbound train currently share a common track and platform. Until the fourth track is added, this arrangement will constrain the expansion of service through Oakland and San Francisco. This is a precursor project to an eventual second Bay Tube.

8. **Convert Caltrain to urban metro service in the eastern neighborhoods of San Francisco.**

The advent of high speed rail in San Francisco will expand the Caltrain corridor to four tracks and enable local service without delaying express service. The Bayshore station is the site of a proposed, 20-acre transit village on the former Schlage Lock Site, and the 600-acre+ former railyard to the south is the largest undeveloped in-fill site on the northern peninsula. A new station at Oakdale could serve as the Bayview's "downtown" and southeast SF's chief transit node. Moving the sewage plant to Piers 94-96, as has been discussed, would free up a big chunk of land to the east of the proposed station for transit-oriented development. Similarly, a station near 16th could serve UCSF and the 16th Street BRT corridor.

9. **Extend Muni's M line to Daly City.**

Inter-system connectivity would be greatly enhanced by building an approximately one-mile connector between the San Francisco State University Muni stop at Holloway and the BART Daly City Station. The Daly City Station is the access point for BART service south to Colma, San Bruno, South San Francisco, Millbrae and the airport, and it is also an important focal point for SamTrans bus lines. Such a connection would better link neighborhoods in southwest San Francisco, and the major attractor of San Francisco State's commuter campus, to Peninsula communities and job sites.

10. **Extend the Central Subway and/or the F-line to the Presidio.**

Second to the Richmond district, the Marina district of San Francisco has the density to support rail transit. Muni's lines to the Marina (lines 30, 30X, 41, and 45) carry more than 22,000 trips, each way, every day. There are a variety of options to serve the neighborhood with rail service which deserve further evaluation, including an extension of the Central Subway under Russian

⁸ Two previous studies have recommended this as the best location to begin tunneling under the Bay for a new Transbay Tube.

Hill and the Marina, surfacing in the Presidio. An extension of the F-line under Fort Mason and along the Marina would provide an important link for tourists but would probably not meet the commuter need. Should San Francisco build both?

RECOMMENDATION #2: PROVIDE FAST AND FREQUENT SERVICE FOR REGIONAL TRIPS, ESPECIALLY FOR COMMUTERS

To some degree, drawing a line around a geographic area and calling it a "region" is fairly arbitrary. For purposes of this paper, regional trips are trips within the nine-county Bay Area. These are trips that account for 97 percent of commuter travel and probably an even higher proportion of important non-work travel: visits to family or recreation or shopping or cultural institutions. As noted, these longer trips require wider stop spacing, less frequency, and enough seating to comfortably accommodate all travelers.

Trips outside of the Bay Area to locations in the megaregion — Sacramento and the Central Valley — and elsewhere in the state are intercity trips for purposes of this plan. SPUR's recommendations for those trips come after this section. It must be noted, however, that many of the improvements we recommend for regional rail are the same improvements necessary for intercity trips. Upgrades and better connections to the East Bay Amtrak corridor are critical for intraregional trips as well as trips from the Bay Area to Sacramento. Upgrades and better connections in the Caltrain corridor are key for travel between San Francisco and San Jose as well as travel between those cities and the entire state once high speed rail is built. Our recommendations in this section are organized by corridor, for ease of understanding.

Peninsula Early Action Items

1. Electrify Caltrain from San Jose to San Francisco.

Electrified multiple-unit (EMU) train technology — in addition to reducing energy costs, noise and air pollution — can accelerate and decelerate faster than the conventional diesel locomotive-powered trains that Caltrain currently operates. As such, Caltrain estimates that running EMU vehicles will result in a 13 percent improvement in travel time between San Francisco and San Jose.⁹ Just as importantly, improving speeds will enable better utilization of the tracks, since faster trains means more of them can be run on the same route. While conversion to EMU technology will require significant capital investment and special approval from the Federal Railroad Administration, the payoff in faster and more frequent service makes this an important investment. Electrification and fleet conversion should also introduce level boarding — that is, car floors and station platforms are at the same height.

Note that this recommendation calls for electrification from San Francisco to San Jose, and not on the entire Caltrain line from San Francisco to Gilroy. As a short-term cost-saving measure, diesel trains should continue to provide service on the low-demand San Jose to Gilroy link. See the next recommendation for details on how to provide that service.

2. Connect the Peninsula to downtown San Francisco by extending Caltrain to the Transbay Transit Center.

In addition to its better proximity to the high density of jobs downtown, the new Transbay Transit Center — now in its design phase and slated to accommodate Caltrain in 2019 — will function as an intermodal hub connecting Caltrain with BART, all Muni Metro lines, and a number of regional

⁹ *Caltrain Rail Corridor Electrification: San Francisco – San Jose Factsheet*, www.caltrain.com.

bus lines. The Caltrain downtown extension also paves the way for an eventual California High Speed Rail station, which would share a right-of-way with Caltrain.

Another short-term action is preparation for later expansion: design of the downtown extension must be able to accommodate a connection to an eventual Transbay crossing separate and apart from the existing Transbay Tube. Further, the Terminal should be well-connected to the existing Montgomery BART station to the north (through an underground pedestrian passage) and a possible BART station to the south.

3. Upgrade and add tracks to Caltrain right-of-way.

In order to accommodate growth in demand and a forthcoming high-speed rail service sharing Caltrain's right-of-way, the Regional Rail Plan recommends expanding the current double track on the peninsula between San Jose and San Francisco to three or four tracks. These tracks will need to be fully grade-separated to accommodate high-speed rail.

East Bay Early Action Items

Strengthening the link between the eastern suburbs and the East Bay, the Peninsula, and San Francisco is an important part of SPUR's comprehensive regional rail plan. Our first recommendation is a key link in the whole East Bay system and is also critical for intercity rail. The subsequent recommendations, combined, will provide fast and frequent rail service connecting the cities in the eastern and southern shores of the Bay (Richmond, Berkeley, Emeryville, Oakland, San Leandro, Hayward, Union City, Fremont, Milpitas and San Jose) as well as three of the five cities in the Tri-Valley (Dublin, Pleasanton and Livermore).

Add speed, capacity and connections to the Amtrak corridor in the East Bay

A combination of adding tracks and acquiring certain rights-of-way for dedicated passenger tracks along this corridor will enable faster and more frequent service between San Jose, Oakland and Richmond. Regional rail services along the East Bay could be expanded and improved at a relatively low cost by cooperating with the freight operators and undertaking a few targeted measures to relieve the conflict. The goal is to increase the number of slots available for passenger trains — we are using all the available slots negotiated with the Union Pacific railroad— to prevent delays of passenger trains by freight trains and to separate freight from passenger tracks. SPUR's analysis concludes that the segment between Emeryville and Hercules is the highest priority for additional tracks.

Immediately, this improvement should permit travel between Oakland and San Jose in less than an hour. By comparison, the trip from San Francisco to San Jose on the Caltrain line — a trip that covers a similar distance, but on lines without passing tracks, takes 59 minutes. With eventual electrification, this trip could be accomplished in about 40 minutes, faster than a car and faster than the 63 minutes it will take on BART between San Jose and downtown Oakland. By comparison, Caltrain will cover the distance between San Francisco and San Jose in just 30 minutes after the construction of the high-speed rail line, which includes electrification.

In addition to better service on the line, the line also needs better connections to BART. The existing BART-Amtrak transfer point in Richmond should be moved further south, where the two systems cross in West Oakland. This improvement alone would reduce the overall travel time between San Francisco and Sacramento by 30 minutes. This could be accomplished by constructing a common intermodal station or by building an airport-type people-mover or moving sidewalk connector between the existing West Oakland BART station and a new Amtrak station. This connection will play an important role in

facilitating improved intercity rail travel, as the East Bay Capitol Corridor is part of the intercity link between San Jose, Oakland and Sacramento.

Upgrade the ACE trains by purchasing tilting DMUs and increasing frequency

The Altamont Commuter Express train, known as the ACE, shuttles workers from the sprawling Central Valley towns of Stockton and Lathrop through the Livermore Valley to San Jose. The train makes only four morning runs westbound and four afternoon runs eastbound each day. The trip takes about two hours, station to station, compared to about one hour and 20 minutes by car, door-to-door. For most people, the train is not a reasonable option, and instead they choose to drive. Interstate Highway 680 between Dublin and Fremont is one of the most congested freeway segments in the Bay Area.

SPUR is ambivalent about upgrades to this corridor. On the one hand, improved rail transportation is necessary to convert car trips to train trips and reduce emissions. On the other hand, relying on the Central Valley to provide housing for the inner Bay Area workforce runs counter to SPUR's urbanist agenda and is not something we want to facilitate. Balancing these concerns, SPUR supports improved transit between these far-flung communities, urges the creation of urban centers at each of the towns along the line, and opposes expansion of highway capacity.

Fast, frequent transit in the Altamont corridor could be a catalyst to urbanize the towns and cities along the route. In fact, development around transit stations along the ACE line could create new transit- and pedestrian-oriented neighborhoods that cause dramatic reductions in vehicle miles traveled for the residents of these areas, above and beyond the reductions caused by the conversion of auto trips to train trips. Furthermore, these new centers will create value that could be captured for the improvement of transit options, including the ACE line.

That said, significant improvements in this corridor are very expensive, and possibilities for affordable, incremental improvements are limited. The corridor currently consists of a single track that winds very slowly over the Altamont Pass and through Niles Canyon in the Central Valley, the Livermore Valley and the East Bay. The tracks are owned by Union Pacific whose freight traffic limits the ability to increase passenger trains in the corridor. UP dispatchers are supposed to control train traffic to facilitate a 95 percent on-time rate for ACE but do not always achieve that goal.¹⁰ An adjacent right-of-way — already publicly owned in Alameda County — could be fully purchased and developed for exclusive use by passenger trains, but this right-of-way is more circuitous and slower than the existing right-of-way, and therefore of dubious benefit. Significant increases in speed will require a new right-of-way and extensive tunneling and bridging, very costly projects probably not worth the benefit.

In the short term, SPUR recommends that the Joint Powers Authority that operates the ACE train purchase tilting trains to make it possible to maintain higher speeds on the winding track. Tilting trains are the basis for the highly successful Acela Express between Washington, D.C., and Boston. Faster trains should make the trains more attractive and enable greater frequencies. In the long term, SPUR recommends that the High Speed Rail Authority prioritize improvements to the Altamont Pass, and finance the purchase of new rights-of-way and the extensive tunneling and bridging necessary.

¹⁰ While the trains have been on time about 90 percent of the time in recent months, the on-time rate has dropped to as low as 68 percent at times, especially when bad weather in Long Beach forces more shipping traffic to the Port of Oakland.

North Bay Early Action Items

Launch Sonoma-Marin Area Rail Transit (SMART)

Highway 101, as the only transportation link between Marin and Sonoma Counties, is a routinely congested vehicle corridor and among the worst bottlenecks in the Bay Area's highway system. A rail alternative is clearly needed to connect these two counties, and fortunately a right-of-way already exists along that corridor — the former Northwestern Pacific Railroad. The Sonoma-Marin Area Rail Transit (SMART) Project was conceived to establish standard-gauge diesel multiple unit (DMU) service over this corridor. Because the right-of-way is already publicly owned, rail can be introduced along this route at a lower cost per mile than any other new rail expansion under consideration in the Bay Area.¹¹ The envisioned route extends 70 miles from Cloverdale in Sonoma County to a site within walking distance of the Larkspur Ferry Terminal, and will be operational by 2014 if the voters pass the proposed sales tax this November.

Future investments in this corridor should include a better connection to the ferry terminal at Larkspur, which is currently planned to be about 1,300 feet from the boats. Ideally, the SMART train should be extended 1.4 miles to a new ferry terminal located at the point at San Quentin, where departing ferries can avoid the no wake zone that forces slow speeds and adds nearly 10 minutes to the San Rafael-to-San Francisco trip.

Mid-Term Action Items (By 2030)

- **Extend BART to connect to ACE in West Livermore.** The BART system currently terminates in Dublin/Pleasanton, approximately six miles short of the ACE route through Livermore. While this gap is currently bridged by a bus route, connecting BART to ACE would facilitate and speed many trips between the Bay Area and San Joaquin Valley. A study commissioned by the MTC concluded that connecting the two systems in the vicinity of Isabel Avenue and Stanley Boulevard was the most viable option. BART is about to begin environmental studies of this extension. It should be given high regional priority.
- Like the connector in West Oakland, this is an example of an improvement that serves both regional trips and intercity trips. This link will connect BART to the eventual high-speed rail train between the Bay Area and the Central Valley via the Altamont Corridor portion of high-speed rail.
- **Build service across Dumbarton.** The existing rail trestle that parallels the Dumbarton Bridge should be rehabilitated to allow for a conventional rail connection between Union City and Redwood City. Such a project would enable a rail link that connects to ACE and the Capitol Corridor in Fremont-Centerville and to BART in Union City. The Dumbarton Bridge will also help to relieve congestion in the Transbay Tube. Passengers from the Tri-Valley and southern portion of the East Bay will find it faster to reach downtown San Francisco via the Dumbarton Bridge and the electrified Caltrain corridor than to travel on BART through the Tube.
- **Overlay service on the Capitol Corridor.** Intercity rail improvements along the Capitol Corridor should be coordinated with the development of a local overlay service stopping at communities along the corridor, such as Hercules.

¹¹ SMART White Paper No. 3: "Alternatives for the NWP Corridor," February 2008.

- **Build the Oakland airport connector.** A direct link via people mover between the BART and Amtrak station will make transfers easier and provide a simple and fast connection to Oakland International Airport.

RECOMMENDATION #3: IMPROVE INTERCITY TRAIN TRAVEL

The Bay Area is about to join most of the rest of the world in terms of the availability of intercity rail travel, with the approval in November of the California high-speed rail bond. The High Speed Rail Authority promises to build fast train service in two corridors: south of San Jose through the Pacheco Pass and through the Tri-Valley to Tracy and Stockton via the Altamont Pass. While the Pacheco Pass has some advantage for trips between San Jose and Los Angeles, most rail trips between the Bay Area and other cities will require investment in the Altamont Pass. The second corridor that requires intercity rail upgrades is Amtrak's Capitol corridor between San Jose, Oakland, and Sacramento. Third, SPUR includes rail access to the regional airports in the intercity rail category. The recommendations for intercity rail travel in this plan are organized in these three categories.

Please note that many of the recommendations in the section on regional trips are critically important for intercity trips as well. Take the rail journey from San Francisco to Sacramento, for example. Right now, it comprises two segments: a passenger rides BART from San Francisco to Richmond and then transfers at Richmond to a Capitol Corridor train. The BART section between San Francisco Civic Center and Richmond makes ten stops, takes a full forty minutes, and is relatively uncomfortable (because BART serves so much as an urban metro system). From points south of San Francisco, the trip gets even more complicated, requiring an additional leg on Caltrain and eight more BART stops. (Adding insult to injury, the Amtrak portion of the trip is often delayed as a result of competing for right-of-way with freight traffic.) When the West Oakland connection is made (as recommended above), the trip to Sacramento includes just one BART stop and a quick transfer to the Sacramento-bound Capitol train.

Capitol Corridor Early Action Items (by 2020)

1. **Add tracks to the Capitol Corridor between Benicia and Sacramento.**

Growth in freight business combined with the desire for fast and reliable passenger service will require an aggressive undertaking for more track capacity along the Capitol Corridor. In the regional rail section, SPUR calls for a third and fourth track to be added to the segment between Oakland and Richmond. For fast and reliable intercity rail service, that improvement should be complemented with an additional track starting in Benicia where a bottleneck exists to Sacramento.

Altamont Corridor Early Action Items (by 2020)

2. **Deploy tilting DMU's for ACE.**

SPUR's recommendation for regional rail called for the use of tilting DMUs on the ACE corridor. Naturally, those same trains will complete the whole trip between Stockton and San Jose.

Mid-Term Action Items (By 2030)

- **Build new tunnels through the Altamont Pass and Niles Canyon.** Tunneling will provide relief from the steep, winding right-of-way and will lay the groundwork for any future high-speed rail connection.
- **Electrify the Altamont-Tri-Valley-Dumbarton corridor.** Again, in preparation for high-speed service, and to enable "mid-speed" service in the interim, the entire corridor should be electrified with EMU technology deployed.
- **Second Bay crossing.** In conjunction with the recommended BART line, a new bay crossing should contain tracks for conventional and high speed rail. Once introduced, this connection would complete a single, contiguous route from the Peninsula to Sacramento via San Francisco. Strategically, this is a crucial project that finally would offer fast and direct service between two of the largest trip-generating cities in California. It is crucial that the underground facilities in and around the Transbay Terminal be designed to accommodate an eventual transbay crossing.
- **New passenger-only alignment & Carquinez Strait crossing.** Creating a rapid route between the Bay Area and Sacramento will eventually necessitate the construction of a dedicated passenger rail alignment within Contra Costa Country, including a tunnel through the hilly terrain and a new high bridge over the Carquinez Strait. The alignment would either cross at the current location in Martinez or near the I-80 crossing in Crockett. The latter option would mean that passenger service is rerouted along an existing right-of-way passing through Vallejo and Jameson Canyon.

RECOMMENDATION #4: MATCH LAND USE TO RAIL SERVICE

Getting the land use right is key to success in getting a good number of trips converted to train trips. Jobs and housing must be reasonably close to train stations for many people to find taking the train a favorable choice. The effect is so strong, that we would attract more people to transit by putting housing next to BART stations than by putting parking lots, although it's usually advantageous to both if possible.

1. Support high-density housing and jobs along the Caltrain corridor.

The West Bay between Santa Clara and San Francisco has some potential for transit-oriented development. That potential is limited due to the low density, built-out nature of most of the neighborhoods through which the tracks travel. But some neighborhoods on the Peninsula do have "brownfields" that would benefit from redevelopment, and downtown San Jose itself and the neighborhood around the Tamien station have vast areas that would support higher density development.

2. Build more transit villages at suburban BART stations.

BART has enjoyed success with development at its suburban BART stations, including in some cases development planned and financed by BART on BART property. As noted in the introduction, transit-oriented development, especially jobs, is more likely to reduce vehicle miles traveled than most other public policy interventions.

BART should continue its practice of converting surface parking lots to job centers and housing, especially in the urban core. The North Berkeley BART station, for example, sits on an entire city block of surface parking that could provide hundreds of jobs and housing units for people, most of whom would rely on BART for many of their trips.

However, care should be taken to ensure that BART passengers who currently park their cars at the station have an alternative that allows them to continue using BART. Alternatives could include express bus service — a one-ride trip — to downtown San Francisco, and safe and convenient bicycling routes and parking to the stations. However, in looking at that same example of North Berkeley, many of the people using the parking drive from the hills of Berkeley where low-to-moderate housing densities make transit service impractical and where the street grades make bicycling too difficult. BART should generally replace surface parking with more compact structured parking to ensure nobody is turned away from the train for lack of access.

Mid-Term Action Items (by 2030)

Build more infill stations on BART

Infill stations (new stations between existing stations) should be evaluated on the same criteria as extensions, but BART and the MTC tend to fund extensions, even where infill stations would perform better, on the key criteria of transit access, connectivity, and ridership, as well as providing opportunities for jobs and housing. SPUR has identified six locations, in addition to the stations that will be built as part of a new line in downtown San Francisco, where the existing or proposed land uses would justify the addition of a new station on the BART line. These should be pursued only after BART's capacity problems are fixed. In San Francisco, a new station at 30th Street between the 24th Street and Glen Park stations would attract a high number of new passengers. It also would provide a convenient connection to several Muni lines, including the J-Church light rail line. A new station in downtown San Bruno would put a BART station within walking and bicycling distance of the places people travel to and from in San Bruno. In the East Bay, a station at Solano Avenue in Albany should be evaluated. A new station between Lake Merritt and Fruitvale would serve not only the relatively dense San Antonio neighborhood, but also the new Oak to Ninth Street development. This station also could provide an intermodal link between BART and Amtrak, as the lines are immediately adjacent to each other at this location. If a new connection is built to provide a direct connection between the Dublin/Pleasanton line and the Fremont line, an infill station in Hayward would make sense. Finally, as already being evaluated by BART, an infill station at Irvington, an unincorporated area near Fremont, would make sense if development at that location justifies it.

A new Hercules station will serve the new residents of the waterfront transit-oriented development being built in conjunction with a new ferry landing. The Capitol Corridor rail line passes immediately next to the waterfront and within walking distance of most of the neighborhood, and would link Hercules residents to Berkeley, Oakland and San Jose as well as Davis and Sacramento. Ferry service to San Francisco's Ferry Building would take about 42 minutes, giving Capital Corridor passengers a third way to reach San Francisco in addition to the Amtrak Thruway Bus from Emeryville and BART from Richmond.

RECOMMENDATION #5: IMPROVE GOVERNANCE AND FUNDING

The Bay Area is not alone in facing a difficult challenge in coordinating a variety of competing or independent rail operators and transit agencies. In London, passengers may travel on any of the city's public trains and on many of the various private rail systems for the same fares and using the same farecard. In Chicago, recent legislation strengthened the Regional Transportation Authority, a consortium with the legal power to control most of the funding for the three major transit providers in the region (the Chicago Transit Authority, the regional commuter rail system Metra, and the suburban bus system

PACE). The goal is for this agency to prioritize capital expenditures among the three region's agencies in light of regional transportation priorities instead of regional political priorities.

In the Bay Area, regional coordination exists but it is very limited. A great example is the ability of San Francisco passengers to use their monthly transit pass, issued by the SFMTA, on BART. Also, after many years of development, the regional fare card, Translink, is beginning to be operational. Passengers can use Translink on AC Transit, Golden Gate Transit, the Dumbarton Express, and Muni Metro. Expansion to BART and all of Muni is expected soon. Translink enables passengers to pay their fare on multiple operators with a single fare instrument, and, theoretically, allows rationalization of fares across agencies so that passengers are not penalized because their trip requires crossing the jurisdictional line of a transit agency.

Part of the problem is decentralized governance. There are no fewer than seven operators or owners of rail systems in the Bay Area, not counting the freight companies:

1. **BART** is governed by a nine-member board of directors elected directly by voters and each representing a distinct district in the three BART counties, San Francisco, Alameda, and Contra Costa County.
2. **Muni's** metro is run by the Municipal Transportation Agency, a seven-member board appointed by the mayor of San Francisco and confirmed by the Board of Supervisors.
3. **Caltrain** is owned and operated by the Joint Powers Authority, a nine-member board appointed by political leaders from San Francisco, San Mateo and Santa Clara counties.
4. **VTa's** light rail is run by the Santa Clara County Valley Transportation Authority, a board appointed by the mayors and Board of Supervisors of Santa Clara County.
5. **Amtrak's Capitol Corridor** is owned by Amtrak but operated by BART.
6. **The Alameda Commuter Express** is operated by an 11-member commission appointed by the San Joaquin Council of Governments from local agencies, including three ex-officio members representing Caltrans District 10, the San Joaquin Regional Transit District and the San Joaquin Council of Governments.
7. **The SMART train** is governed by the Sonoma-Marín Area Rail Transit District directors, a 12-member board consisting of elected officials from the counties and cities, and two representatives of the Golden Gate Bridge District.

Consolidating some of these agencies and forcing more coordination among them is absolutely critical to the success of our regional rail system. SPUR recommends that the California Legislature hold hearings addressing the consolidation of these agencies, most importantly BART and Caltrain and the East Bay's Capitol Corridor. Including the light rail agencies is probably not wise nor practical as these systems are operated as part of an integrated system that includes local bus service. Including ACE makes a great deal of sense from the point of view of service coordination, but it is currently owned and operated from outside of the nine-county Bay Area, presenting a geographical obstacle. Including SMART is not necessary as it does not directly link with any other rail service.

There are many political and legal challenges to such a consolidation. Will BART simply absorb the other agencies? Will the new agency apply objective criteria to planning decisions about expansion, mode, and capacity enhancements, or will it exhibit a bias toward its strongest partner? These questions deserve serious consideration. Better governance of regional rail would provide a more legible customer experience. We would have "Bay Area Rail Transit" around the bay with different kinds of trains and rails and stations, but the same "brand" and incredible ease of use.

Specifically, SPUR calls for better governance to accomplish the following goals:

- **Fare integration.** Translink opens the door to better fare integration, but rationalizing rail fares, and making provisions for rail-to-rail and rail-to-bus transfers and joint fare instruments, will require coordination.¹²
- **Right-of-way preservation,** including not only existing rail rights-of-way but also utility rights-of-way, rights-of-way in roadway alignments, etc.).
- **Acquisition of tracks** or rights to tracks from existing rail freight companies. Negotiations are a challenge for the region. We would get further with a unified and strategic approach to negotiating for right-of-way, with the public sector financing a program of public investments in capacity improvements, and the railroads ceding trackage rights and/or rights-of-way.¹³
- **Regional rail planning.** The regional rail plan should be updated regularly. The task force should determine who should lead, who should participate, who should fund, and who should monitor progress on the rail plan.
- **Standards and interoperability.** To the greatest extent possible, new rail infrastructure (stations and rolling stock) should be built to consistent standards — platform height, vehicle width, electric supply, safety and signaling systems. It would also be great if systems like signage and wayfinding, timetables, real-time information, etc. were also consistent from system to system.
- **Equipment and maintenance sharing.** Using consistent standards for vehicles and interoperability opens up the possibility of joint procurement (purchasing larger lots of vehicles and other equipment can lower the price), shared equipment and maintenance facilities. A fleet of diesel and electric vehicles that are interoperable lends itself to phased electrification; as routes are electrified, diesel equipment can be transferred to other corridors to open up new services.

CONCLUSION

Today's headlines bring a newfound sense of immediacy to the customary arguments for investing in passenger rail. Oil will continue to impose rising costs on transportation as world production begins to decrease, making rail an even more economically attractive alternative to driving or flying than in the past. As politicians of both major parties are sounding the alarm of global warming and singing to the tune of energy independence, converting motorists into customers of energy-efficient transit modes should again become a public policy priority.

If we make an urgent investment in urban rail capacity and set ourselves up for continued success with an effective new regional rail authority, Bay Area residents should soon enjoy the ability to travel within the region by train the way people in most regions in the world do. It will keep the Bay Area economically competitive and help us be responsible global citizens.

¹² *Transport for London, for example, brought several private railways into their zone fare system and onto their oyster card, so that riders can use all of the various railways as one integrated system, leaving the operators to sort out the revenue sharing on the back end.*

¹³ *The Los Angeles County Metropolitan Transportation Authority built a fully grade-separated freight corridor connecting its ports to the railyards southeast of downtown. In return, the freight operators transferred several parallel corridors to the LAMTA for future transit service.*

APPENDIX A: RAIL IN THE BAY AREA TODAY

HOW MANY PEOPLE IN THE BAY AREA USE PUBLIC TRANSIT?

Bus	956,907
Rail	593,005
Ferries	10,885

Source: Statistical Summary of Bay Area Transit Operators, March 2008

Note: Data excludes cable cars

HOW MANY PEOPLE RIDE TRAINS TO WORK?

Muni light rail	170,426
BART	355,449
VTA Light Rail	26,138
Capitol Corridor	3,500
ACE	2,625
Caltrain	34,867

Source: Statistical Summary of Bay Area Transit Operators, March 2008

Note: Numbers are daily weekday ridership averages

In the Bay Area, the Muni Metro and Valley Transit Authority systems are "light rail" systems serving the more densely populated urban centers of San Francisco and greater San Jose, respectively. Muni is a historic system, designed at the beginning of the last century (except for the subway portion); VTA is a modern light rail system. Both were designed with very short distances between stations, and frequent service. Stations are simple, and for the most part are integrated into their urban setting. Their cars are designed for more rapid boarding and more standing capacity than those of longer-distance trains.

BART and the downtown portions of Muni Metro are "urban metro" services. These are like streetcar systems in their vehicle characteristics, but because they operate in exclusive rights-of-way they enjoy faster speeds. Therefore the stations are farther apart.

Caltrain, by contrast, carries its passengers over longer distances across three counties. Serving primarily peak-hour commuters between San Francisco and Peninsula cities, its stations are generally two to five

miles apart and its cars are designed for comfort with high seating standards rather than for fast boarding. The Altamont Commuter Express is another example of commuter rail, linking the Tri-Valley area to Santa Clara County. The Amtrak Capitol and San Joaquin Corridor services are examples of "intercity rail," used for even longer trips in and out of the region. These trains have plush upholstered seats and a café car where passengers can buy a drink or rather than for fast boarding. The Altamont Commuter Express is another example of commuter rail, linking the Tri-Valley area to Santa Clara County.

SINGLE YEAR RIDERSHIP INCREASE

	2006-07	Last quarter 2007-08	Percent increase
BART	355,449	375,300	5.6%
Caltrain	34,867	44,751	28.3%
VTA light rail	26,138	32,978	26.2%

Source: BART, Caltrain, VTA records

The Amtrak Capitol and San Joaquin Corridor services are examples of "intercity rail," used for even longer trips in and out of the region. These trains have plush upholstered seats and a café car where passengers can buy a drink or a snack. Between Richmond and Sacramento, the train makes only three stops that are about 20 miles apart. Longer trips on ACE, which extends all the way to Stockton in the Central Valley, also would be classified as intercity service.

BART, the largest by far of the Bay Area's rail systems, doesn't fit neatly into any of the categories discussed above. Passengers within San Francisco may use BART as an urban metro system, hopping on and off several times a day for quick trips within the city. Stations are less than one mile apart in downtown San Francisco and Oakland. Outside of those downtowns, passengers use BART more typically for commuter rail service. Pittsburg residents, for example, will need 53 minutes on BART to get to work in downtown San Francisco, and are not likely to take that trip more than once each day.

As Bay Area rail matures, it won't be just BART that has to cope with different kinds of service demands on its system. Caltrain already is struggling with the competing demands of its intercity service connecting San Francisco to San Jose and its regional rail service stopping at the numerous destinations on the Peninsula between those cities. Similarly, in the East Bay, the Amtrak Capitol Corridor serves almost exclusively as intercity service linking San Jose and Oakland (and the rest of the Bay Area via a BART connection) but should soon be providing regional service linking the destinations in the East Bay with the rest of the Bay Area.