# 6.0 Study Issues, Opportunities and Strategies

## 6.1 PLANNING CONTEXT

The Bay Area's existing and future geography and land development, rail infrastructure and growth and travel patterns interact to create the context within which planning for the regional rail system will occur. Our mountains, bays and rivers limit the number of feasible rail corridors through which both passenger and freight rail traffic can move. Our geography and development patterns have left unfulfilled connections between rail systems. Past policy decisions have resulted in several independent rail entities that currently operate and manage the Bay Area's rail services. The challenges of growth and climate change call for stronger efforts to coordinate land use and transportation. The proposed statewide high-speed train system brings exciting possibilities along with complex unresolved implementation issues.

Common opportunities and constraints that must be addressed by all metropolitan areas that want to improve their rail system include:

- Coordinating service schedules so that riders can transfer between routes quickly
- Preserving rights-of-way for future rail use
- Obtaining access for passenger trains to use tracks owned by freight railroads
- Accommodating demand for passenger and freight services within the same corridor
- Funding the significant capital, operating, and maintenance costs of rail infrastructure improvements

The Bay Area's rail system currently faces many challenges:

- Lack of coordination and connectivity between rail providers, as well as rail and local transit services, making travel on the existing rail system challenging and inconvenient for many people.
- Significant capacity constraints on the two major regional rail services — BART and Caltrain, and significant funding needs for BART's seismic retrofit program, long-term maintenance programs and "core capacity" improvements.
- Capacity limits for rail operators that share their tracks with private freight service, including Capitol Corridor's service from Sacramento to Oakland and San Jose and ACE's service between Stockton and San Jose, which experience frequent delays due to increased freight activity and have few available slots to operate more trains.
- Disjointed institutional arrangements and governance structures that limit the ability to integrate and coordinate services.
- A complex fare system that is not integrated between operators.

The issues, opportunities and strategies to be addressed by the Regional Rail Plan can be grouped into three broad categories, and are discussed in more detail below:

- Rail System: passenger rail technology, line capacity, physical connections, and schedule coordination
- New and Growing Rail Services: the BART system, high speed rail, and short-haul freight
- Policy and Implementation: right-of-way preservation, land use integration, governance, and funding

## 6.2 RAIL SYSTEM

### Passenger Rail Technology

There are several types of rail passenger vehicles in use in the Bay Area. These include trolley/cable cars in San Francisco; light rail vehicles (LRVs) in San Francisco, San Jose, and Sacramento; heavy rail metro used by BART; and diesel locomotive hauled passenger coaches operated by Caltrain, ACE, Capitol Corridor, and Amtrak San Joaquin.

As we look to the future, there are several modern rail technologies, currently available and under development around the world, that could be applicable in the Bay Area:

- Self-propelled diesel multiple units (DMU), which have the flexibility to operate as part of a longer conventional train, as well as a single unit. Operating economics favor DMU technology for trains of up to three cars in length. Diesel locomotive hauled trains are more economical for longer trains.
- If electrification is available, motive power for can be provided by electric locomotives. Dual powered locomotives can also be used, to avoid changing power units for operation on non-electrified territories.
- Multiple units and unpowered coaches are both available in bi-level and single-level configurations. The best type must be evaluated in the context of market demand and other factors.
- Potentially the most advanced vehicle type is an Electric Multiple Unit (EMU) train composed of self-propelled units coupled together, sometimes including non-powered "trailer" cars in the consist. Caltrain recently, as part of its Vision 2025 plan, adopted the concept of electrification using bi-level EMU technology.

So-called "lightweight" technologies such as EMU's and DMU's are not always available or applicable in the United States. Presently, passenger equipment which operates in mixed flow with freight trains must meet the crash worthiness standards set by the Federal Railroad Administration (FRA), as codified in 49 CFR, Part 238. Under certain specific scenarios, the FRA may allow operation of non-compliant vehicles, such as lightweight cars typically used by High-Speed Trains (HST).

Alternatively, where a line is passenger-only, or where freight traffic is temporally separated (e.g., freight trains may operate at night when there is no passenger service or where certain tracks can be dedicated to freight movements) lightweight equipment may be utilized. The advantage of using lightweight equipment, especially in conjunction with electrification, is greater rates of acceleration and higher top speeds along with lower energy consumption.

Under current US regulations, in order for a line to be modified from standard, FRA-compliant equipment to one that operates with non-compliant, lightweight equipment, all of the vehicles must be replaced with lightweight units. This contrasts with European practice in which a mix of light and heavy passenger equipment as well as freight traffic is operated on the same line with reliance on the signal system to prevent collisions.

There are a number of efforts such as the BNSF Electronic Train Management System (ETMS) recently approved for demonstration deployment by the FRA, to develop and deploy advanced signaling systems in the US. Potentially with a signal system upgrade to provide "Positive Train Control" (PTC) systems — e.g., integrated command, control, communications and information systems potentially incorporating "moving block signals" (which do not require fixed wayside displays) and automatic train stop features to force a train which passes a restrictive signal to come to a halt, the FRA may issue "waivers" to allow deployment of lightweight passenger equipment on a demonstration basis, and may ultimately revise its policies.

Regardless of whether current FRA codes remain in effect or whether the codes are ultimately revised, there are other reasons to separate freight and passenger traffic, not the least of which is the fact that the trains operate at different speeds and have significantly different lengths. Therefore, for the purpose of the Regional Rail Plan, mixed flow of standard and lightweight equipment is not considered as an option for the ultimate configuration of a line. However, use of waivers and demonstration projects may provide a means for upgrading a line from standard to lightweight equipment over time, without the need for an overnight replacement of all of the rolling stock.

## Line Capacity

The actual capacity of a rail line depends upon several factors. Physical characteristics are important, such as the number of main line tracks, the length and location of sidings and crossovers to allow trains to by-pass or overtake, and the signaling system. But capacity also depends upon the type of train operation which is being served. For example, a slow-moving short freight train which is picking up or setting out cars may block or occupy a main line for as much or more time than would be required to accommodate an 8,000 foot transcontinental freight train.

Strategies to increase rail line capacity to accommodate growing freight and passenger services include:

- Shared Operation — The advantage of shared operation is the ability to incrementally expand passenger services from low levels initially to higher levels over the longer term while limiting investments in trackage to that which is minimally required to accommodate the total traffic mix. With high levels of investment, high levels of traffic can be accommodated. At the highest traffic levels, four tracks are required; at this point in the development of the infrastructure, the line essentially operates with separate passenger and freight tracks although the physical plant can still accommodate inter-operation of all trains on all tracks. Under current FRA standards, passenger equipment must be designed to higher crash resistant standards resulting in slower rates of acceleration and deceleration, even if the passenger line is electrified.

- **Separate Operation** — Regardless of traffic levels, passenger equipment is operated on separate tracks thereby allowing use of lightweight passenger equipment capable of improved acceleration and speeds with lower energy consumption. The typical line segment is a two-track passenger main line, but if traffic levels are very low, a single line with passing sidings may be sufficient. Low levels of freight traffic can be accommodated by nighttime operation. Moderate to high levels of freight traffic can be accommodated by provision of one or two freight tracks. When passenger traffic is very high, a three and four track passenger main line may be needed to support express and local trains.
- **Grade Separation** — Grade separation may be required due to train speeds, the character of train operations versus highway traffic, or by number of tracks. Criteria include:
  - *Numbers of Tracks* – Three track sections are usually grade separated and four tracks require grade separation due to requirements of the California Public Utilities Commission.
  - *Train Speeds* – The FRA has issued an order limiting train speeds to 87 mph on the Northeast Corridor for at-grade crossings and has set a maximum speed of 95 mph for grade crossings with specialized protection systems. For planning purposes, grade separation should be assumed for operation at speeds exceeding 90 mph.
  - *Traffic Levels* – Grade separations may be warranted due to traffic impacts where high roadway volumes interact with large numbers of slower-moving, long freight trains, or because high overall levels of rail traffic result in crossing gates being down for a long time.
- **Electrification** — Electrification is desirable for a variety of reasons including:
  - *Train Speed and Acceleration* – Electric propulsion provides high torque and can be applied to multiple train axles resulting in higher rates of acceleration and deceleration, and higher top speed compared to conventional diesel locomotive driven consists. This feature is desirable for high-speed track segments and for track segments with high traffic levels.
  - *Tunnel Sections and Subways* – Electric propulsion reduces the ventilation requirements for underground or covered track sections.
  - *Land Use Compatibility* – Electrically propelled trains are good neighbors, with lower emission and noise levels.

Table 6.2-1 summarizes the main line track configurations needed to support various levels of freight and passenger traffic.

Table 6.2.1 **Main Line Track Configurations vs. Freight and Passenger Traffic Levels***

| | Low Freight Traffic | Moderate Freight Traffic | High Freight Traffic |
|---|---|---|---|
| **Low Passenger Traffic**<br><br>Infrequent commuter or intercity rail service | ■ **Configuration #1** — Shared operation of freight & passenger on single track with passing sidings. | ■ **Configuration #1** — Shared operation of freight & passenger on single track with passing sidings | ■ **Configuration #2** — Shared operation of freight & passenger on line with two main tracks.<br>■ May require grade separation due to freight traffic. |
| **Moderate Passenger Traffic**<br><br>Frequent passenger rail service throughout the day | ■ **Configuration #3** — Two track passenger line with option for night freight<br>■ May be electrified and/or grade separated if high speeds or traffic levels present. | ■ **Configuration #4** — Shared operation with three main tracks (2 passenger + 1 freight)<br>■ **Configuration #6** — Separate operation with 2 passenger tracks and 1 freight track<br>■ May require grade separation due to highway traffic levels. | ■ **Configuration #5** — Shared operation with four tracks (2 passenger + 2 freight)<br>■ Configuration #7 – Separate operation with 2 passenger and 2 freight tracks<br>■ Requires full grade separation due to number of tracks and freight traffic level. |
| **High Passenger Traffic**<br><br>Mass transit level of passenger rail service typically using light-weight equipment | ■ **Configuration #8** — Three or four track passenger line with option of night freight<br>■ Usually fully grade separated due to number of tracks and speeds. May be electrified due to traffic densities and/or speeds. | ■ **Configuration #5** — Shared operation with four tracks (2 passenger + 2 freight)<br>■ **Configuration #7** — Separate operation with 2 passenger and 2 freight tracks<br>■ Requires full grade separation due to number of tracks and freight traffic level. | Special cases requiring site specific study. |

Figure 5 provides a line-by-line evaluation of the various rail routes in Northern California along with a general characterization of the traffic levels.

High density corridors, shown in red, are those proposed for major growth either in freight traffic and/or passenger traffic, possible electrification, use of electrified and possibly non FRA compliant passenger equipment. These are potential four track corridors, with freight and passenger trains operating on separate exclusive use tracks. Corridors that either fit in this category today or are forecast to reach this status in the future include: Sacramento to Oakland, Oakland to San Jose, Sacramento to Merced, and San Francisco to San Jose.

Medium density corridors (blue) are those with mixed freight, regional commuter operations and long distance Amtrak trains, which use compliant equipment and are not expected to be electrified. Corridors in this category include: Auburn to Sacramento, Merced to Martinez, Tracy to Martinez, Niles Junction to Stockton, Redwood Junction to Newark, and San Jose to Salinas.

Low density corridors (green) are those with either minimal freight or low passenger use, usually offering only peak hour passenger service, possibly only one direction in the morning and the other direction in the evening. This type of corridor will have freight with non-electrified regional commuter operations. These corridors include: The SMART Corridor, Ignacio to Fairfield/Suisun, St. Helena to Vallejo, Tracy to Los Banos, Santa Cruz to Pajaro/Watsonville Junction, Castroville to Monterey, and Carnadero (south of Gilroy) to Hollister.

Fig. 5 **System 2007 Traffic Density**

The high density lines are all at or approaching capacity under existing traffic in their present-day configurations. As a result, significant investment in additional main line tracks as well as operational improvements (e.g., crossovers, sidings and signals) will be required by the Year 2050. Even if no additional regional passenger services were provided, the growth in freight traffic on principal lines such as the UPRR Martinez Subdivision north of Port of Oakland will require capacity investments.

For the Capitol Corridor service to continue to expand and meet the needs of projected customers, investments to the route between San Jose and Oakland, as well as further north from Oakland to Sacramento and beyond will be required. Operational factors need to be taken into consideration. For example, conventional class track supports operation up to 79 mph with an at-grade solution. Above 79 mph, however, the UPRR will not provide dispatching. Therefore, for the Capitol Corridor to operate at 90 mph, separate dispatching of the passenger trackage would be required, even if the equipment is standard weight and FRA-compliant.

Additionally, in order for the Caltrain service to reach traffic levels proposed in its long range plan, as well as accommodate Dumbarton trains on the Peninsula, three or four main tracks will be required for the entire length of the Peninsula.

## Physical Connections

A basic requirement for a well-integrated rail system is provision of physical connections between routes. MTC's 2006 Transit Connectivity Plan calls for the clear delineation of major multimodal transfer hubs and development of additional hubs.

Connection points are truly multimodal. At several locations, ferries or regional bus routes will be connecting to regional rail services, providing a regional link where travel volumes do not justify a rail investment. Local bus and rail services should be continually adjusted and upgraded in response to regional rail improvements and new services.

Key points of existing and future rail, bus and ferry connectivity are listed below, with major connection points in **bold**:

- San Francisco (4th / Townsend) — Caltrain, MUNI light-rail, future High-Speed Rail
- **Transbay Transit Center** — Regional Bus, MUNI bus, future BART, Caltrain and High-Speed Rail
- Richmond — Capitol Corridor and BART
- Martinez — Capitol Corridor and Amtrak San Joaquin long haul trains
- **Sacramento** — Capitol Corridor, Sacramento Regional Transit, Amtrak long haul trains, future High-Speed Rail
- Stockton — ACE and Amtrak San Joaquin long haul trains, future High-Speed Rail
- MacArthur BART — Richmond/Fremont and Pittsburg Bay Point/Daly City lines

- Bay Fair BART — Richmond/Fremont and Dublin Pleasanton/Millbrae lines
- Oakland Coliseum — Capitol Corridor, BART and future Oakland Airport Connector and High-Speed Rail
- Fremont (Centerville) — Capitol Corridor, ACE, future Dumbarton Rail and High-Speed Rail
- **San Jose** — ACE, Caltrain, Capitol Corridor, VTA light rail, and future BART and High-Speed Rail
- Millbrae — Caltrain and BART including connection to SFO, future High-Speed Rail
- Larkspur — SMART and Ferry Services
- Napa Junction — North Bay regional rail services
- Fairfield/Vacaville — Capitol Corridor and North Bay regional rail services
- 65th (Sacramento) — ACE and Sacramento Regional Transit light-rail
- Hercules — Capitol Corridor and Ferry Services
- **West Oakland** — BART, future Capitol Corridor, Amtrak San Joaquin long haul trains and High-Speed Rail
- Oakland 12th Street BART — Cross platform transfer between Pittsburg-Bay Point/Daly City and Richmond-Fremont lines
- Livermore — future BART, ACE and High-Speed Rail
- Union City — BART, Capitol Corridor, future Dumbarton Rail and High-Speed Rail
- Tracy — ACE, future eBART extension, West Side rail and High-Speed Rail
- Castroville & Pajaro — future Monterey/Santa Cruz service and Salinas/San Jose service
- Santa Clara — Caltrain and future ACE, BART and SJC airport connector
- Redwood City — Caltrain, and future Dumbarton Rail and High-Speed Rail

The future regional rail network would be based upon existing transit systems, and today's connectivity points would continue in that function in the future. However, modifications to and expansion of the regional rail network would require some relocation of connectivity points and

restructuring of local and regional bus routes. Connectivity points of regional significance are often located at the terminal stations of rail lines. At these points, buses reaching a wider service area feed into the rail network. As this network expands and new stations serve as terminals, these stations will assume the role of connectivity points. Furthermore, the expansion of the rail network into areas currently not served would call for the reorientation of bus routes to feed into the new rail stations and avoid duplication of service.

Regional connectivity points need to be designed with transferring passengers in mind. Cross-platform transfers, or transfers that involve a simple change in level, are typically facilitated within rail stations. Transfers between rail and bus, however, are often less convenient and may require leaving/

entering a station and a walk between rail platforms and bus stops. Passengers with disabilities in particular may face considerable obstacles when transferring. Thus, the paths of transferring passengers at regional connectivity points should be minimized and enhanced with straightforward signage and dynamic information systems.

Physical connections between rail systems can be classified by their configuration. These principles also apply to connections between rail and local and regional bus transit, as well as to local connecting light rail services.  Four general configuration types are described below, in order of decreasing passenger convenience:

- Cross-platform transfer: for this transfer, passengers get off one vehicle and transfer to another on the opposite side of the same platform, or board a vehicle that arrives later on the same side of the platform or at the same stop.
- Direct vertical connection: this transfer involves a minimal or no horizontal component, only a change in levels.
- Concourse connection: similar to the direct vertical connection, the transfer takes place within an "indoor" environment (though it may be open to the elements). The paths of transferring passengers do not cross streets, though they typically include passage through concourses, halls, or other passages (a horizontal component) and changing levels (a vertical component).
- Extended walk or shuttle connection: in this situation, a platform or stop may be located several blocks away from a corresponding platform or stop. Transferring passengers typically must move from an indoor to an outdoor environment, or vice versa. The transfer may involve crossing streets or taking a short ride on a shuttle bus or peoplemover in order to get from one to the other.

Where feasible, rail alignments should allow for cross-platform or direct vertical transfers to provide the highest degree of physical connectivity.

### Schedule Coordination

Convenient physical connections can be further enhanced by schedule coordination of rail and transit services. Schedule adherence is a cornerstone to achieving the benefits provided by coordinated schedules. The following rail improvement strategies support schedule reliability:

- Improved signaling systems, allowing trains to operate at closer spacing and at higher speeds
- Crossovers and sidings to allow faster trains (typically carrying passengers) to pass slower trains (generally freight runs)
- Adding additional track to address capacity shortfalls
- New alignments to allow faster speeds
- Grade separations

There are three principal types of schedule coordination that are applicable to regional rail service in the Bay Area, and the local transit services that connect to it:

- Pulse Schedules: At a station or stop with a pulse schedule, rail and/or bus transit lines converge at regular intervals at a hub and wait for 3 to 5 minutes during which transfers can be made. A simultaneous pulse schedule includes all lines serving the station at each "pulse", while a staggered or alternating pulse schedule includes only certain lines operating in different patterns. For example, less frequent lines would skip every other pulse. (Headways on the transit routes need to be evenly divisible; e.g. 10 and 20 minutes is good, 15 and 20 minutes is bad.) Pulse schedules can be implemented for local transit routes serving regional rail and BART stations where base headways are greater than 15-20 minutes. In some cases, the pulse concept can be applied between regional rail services themselves. During off-peak hours, BART trains pulse at MacArthur Station to facilitate transfers in all directions. Napa Junction is a stop option in the Regional Rail Plan where two low frequency rail lines would cross; trains could be scheduled to arrive within short intervals, during which they would be held to allow transfers to take place. San Rafael, Stockton, Modesto and Pajaro/Castroville are other locations that could benefit from rail-to-rail pulse scheduling.

- Directional Schedule Coordination: At stations where directional scheduling is implemented, local services are scheduled to "feed" the line-haul rail service in the peak direction of travel. For a traditional morning commute trips to downtown, local transit services would be scheduled to arrive at the rail station about 3-5 minutes before the train to downtown was scheduled to depart. In the evening, local transit would be scheduled to leave 3-5 minutes after the train from downtown arrived. Note that at any specific time of day, this scheme affords convenient transfers only in one direction of travel; transferring passengers in the opposite direction of the coordinated schedule would face longer waits. Station options in the Regional Rail Plan where directional schedule coordination may be desirable include: Sacramento, Fairfield/Vacaville, Richmond, Union City, Centerville, Irvington, San Jose and Tracy. Direct schedule coordination could also be beneficial at regional rail stations served by light rail, such as: Bayshore (Muni Metro); Mountain View, Great America, Capitol, I-880/Milpitas (VTA light rail); University/65th (Sacramento RT).
- Dependent Linked Schedules: This type of coordination applies where one route acts as the continuation of another terminating service. When one transit vehicle arrives, the second vehicle is having a layover and can immediately receive transferring passengers. This requires high reliability on the part of both services and delays on one line would affect service along the line in the forward direction of travel. The following connection points are candidates for dependent linked schedules: Pittsburg/Bay Point, San Rafael, Larkspur, Saint Helena, Vallejo, Livermore, Gilroy, and Pajaro/Castroville.

## 6.3 NEW AND GROWING RAIL SERVICES

### The BART System

A unique part of the Bay Area's urban fabric, the existing BART system is a hybrid providing long distance regional rail service and short-distance urban metro or subway service. In Downtown San Francisco and Downtown Oakland, BART stations function and are spaced like metro or subway stations in any other major city. Yet at the outer ends of the system, stations function and are spaced like those of commuter rail systems in other cities. BART currently carries the greatest number of passengers of all the Bay Area rail system, by far. The system is facing a highly congested Transbay corridor, which is only going to get more crowded. In several areas, there is strong community interest to add "infill stations" between existing stations to better serve local neighborhoods or support transit-oriented development efforts. In addition, there are long-standing concerns from residents and policymakers in the outer parts of the BART District about obtaining service to areas not currently reached by BART tracks. What should BART become in the next 50 years? Should it expand outward, emphasizing its regional rail characteristics? Or should it focus on the urban core, becoming more like a metro or subway system?

### High-Speed Rail

California is pursuing implementation of a statewide High-Speed Train (HST) system for intercity travel between the Bay Area's major cities, through the Central Valley, to Sacramento, Los Angeles, Orange County, and San Diego. The HST system is projected to carry up to 117 million passengers annually by 2030 and will be able to travel more than 200 miles per hour on a fully grade-separated track, with state-of-the-art safety, signaling, and control systems. A trip from downtown San Francisco to downtown Los Angeles will take about 2.5 hours.

Planning for the HST began 10 years ago and the California High-Speed Rail Authority has adopted a business plan and completed much of the environmental review for the plan. The pace of planning is picking up with a likely ballot initiative on in the November 2008 statewide ballot to fund construction of the first phase of the project.

While the vast majority of the statewide route has been chosen, the largest remaining question is how the train would enter the Bay Area, from the east through Livermore or from the South through Gilroy and San Jose. Because the high-speed rail alignment has not been adopted and the project is not funded, this Regional Rail Plan considers four HST alternatives —no HST, a southern alignment, an eastern alignment, and even a fourth option for HST over both southern and eastern alignments.

### Short-Haul Freight

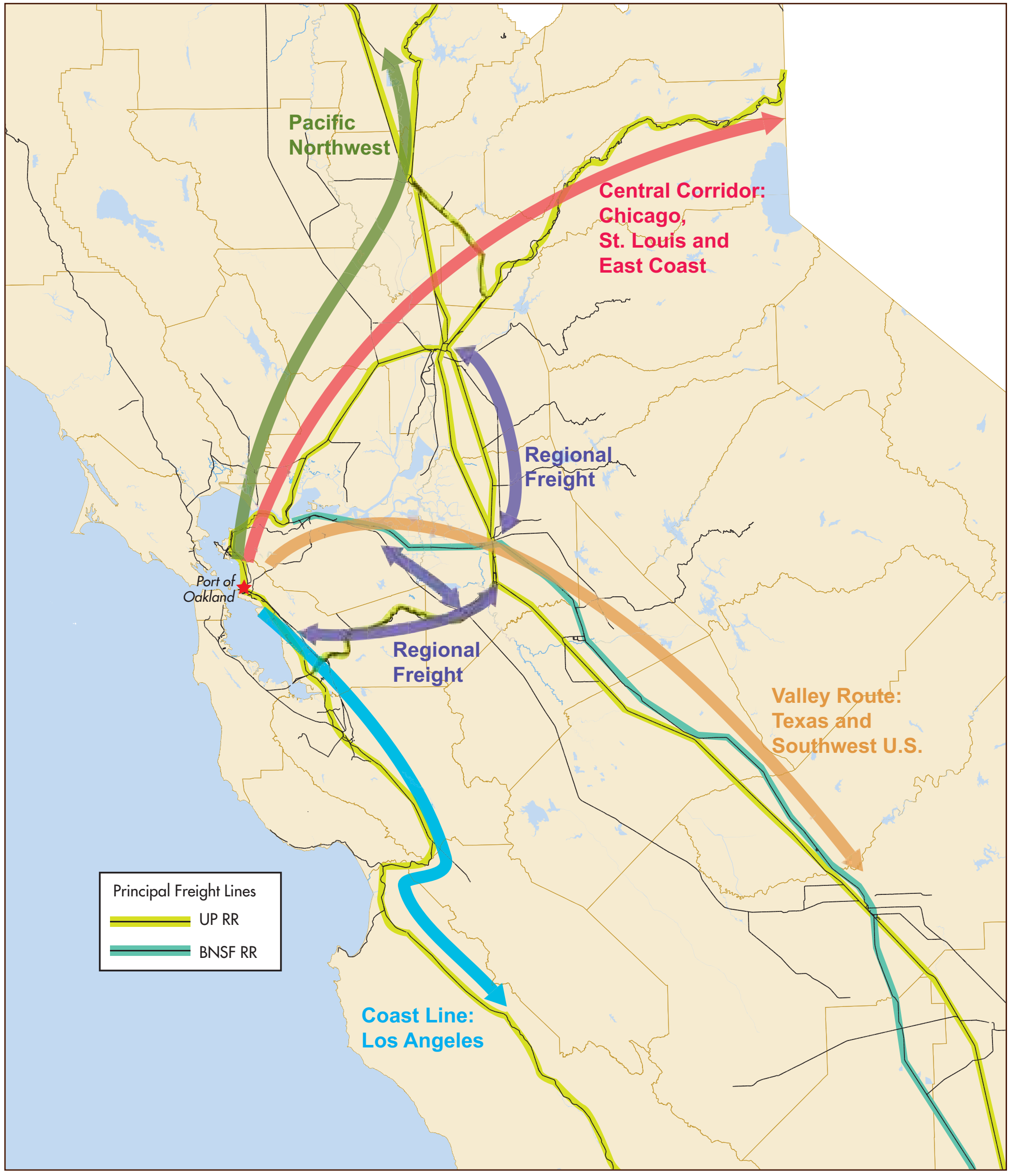
Foreign trade is a cornerstone of California's prosperity, with significant imports and exports in the San Francisco Bay Area and Central Valley. Transportation of international containers between the Central Valley and the Port of Oakland is Northern California's lifeline to foreign markets, but that lifeline is threatened. If exporters must rely on increasingly congested freeways to move their goods, both their ability to compete and the region's ability to grow will be jeopardized. If importers must rely on those same freeways, they will locate elsewhere.

Furthermore, regional planners, congestion management agencies, and regional air quality management districts are all interested in reducing highway congestion and improving air quality by shifting freight presently moving by highway to the regional rail network. At the same time, there is a major emphasis on reducing auto traffic by increasing use of the regional rail network to move significantly more rail passengers, particularly during peak commute hours.

As a result, there is a potential conflict between increased use of the freight rail network for passenger rail initiatives and increased use of the regional rail system to divert highway truck traffic. The question to be answered is: how can short-haul freight be incorporated into a regional railway system where long haul freight is growing significantly and where there is also a desire and need for use of the same network to expand regional passenger service at the same time? Stated differently, how can short haul freight be incorporated into the regional rail system in the most innovative and least costly manner?

The California Inter-Regional Intermodal System (CIRIS) study from June 2006 is envisioned as an umbrella concept for rail intermodal service between the Port of Oakland and the Central Valley. Inland intermodal facilities served by rail shuttle operations offer potential solutions to

Fig. 6 **Northern California Rail Freight Traffic Corridors**



Northern California's looming need for better trade lifelines to San Francisco Bay Area ports. At present, there are significant movements of international containers between the Port of Oakland and numerous points in the Central Valley. Additionally, traffic is drayed over the highway network, increasing both highway congestion and emissions of air pollutants, including greenhouse gasses. If an efficient and economical way could be found to shift this container traffic to the rail network, there could be significant air quality and traffic benefits for the entire region.

Figure 6 presents a proposed short haul route using the rail trackage through the Altamont. The promise of short haul would require the following considerations:

- Capacity improvements in transcontinental freight corridors such as the Central Corridor over the Sierra Nevada and Valley Route heading to the Tehachapis in Southern California such that trackage in the Altamont route could be focused towards passenger and short haul freight.
- Evaluation of the potential to use existing minor rail routes, such at the Mococo and West Side lines, to carry short haul freight traffic
- Institutional and financial arrangements developed in a public-private context to establish and manage the operational cost of providing short haul freight as an alternative to trucking goods between the San Joaquin Valley and Bay Area ports and industries. In general, short haul freight movements require public subsidy to cover the added cost of transloading containers to and from the short haul rail network.

## 6.4 Policy and Implementation

### Right-of-Way Preservation

Assembly of right-of-way to accommodate new rail lines is very difficult within the built up areas in the inner core. Environmental considerations make it difficult to carve out new transportation arteries in greenfields areas. Therefore, existing rail rights-of-way regardless of the current level of use may be critical to allow for development of the rail network. All of the existing rail rights-of-way in Northern California, which could potentially support rail services over the long term, need to be evaluated; and the ultimate potential for each corridor segment identified. In the event that passenger service does not appear to be viable in the near term, these corridors should be preserved for rail use in the long-term future.

The method of preservation is also an issue. Some abandoned rail corridors have been preserved and converted to trails or paths. If a corridor is to be preserved for future rail use, it needs to be understood that development of interim uses does not preclude returning the right-of-way to an active railroad. In most cases the interim use can be retained side by side with the reinstated rail service.

A second aspect of rail preservation is retaining the ability to operate passenger trains within corridors presently owned and used by freight railroads. As both freight and passenger rail traffic grows, the public and private sector must work together to fully utilize scarce space on existing corridors.

## Land Use Integration

Both MTC and BART have adopted policies that link funding for transit expansion with land use. In July 2005, MTC adopted a hallmark Transit-Oriented Development (TOD) policy for regional transit expansion projects to help improve the cost effectiveness of regional investments. The TOD policy calls for planning housing development around new transit routes and stations. MTC provides financial incentives and planning grants to communities that do not meet the threshold.

BART policies require collaboration with communities to make investment choices that encourage and support transit-oriented development and increased transit use. BART's System Expansion Policy helps determine where new expansions will go, in part based on a commitment by the municipality to help generate new ridership with transit-supportive growth and development, as well as a high level of access by local transit, bicycle, and walking to the new station.

State and federal officials are also making the transportation and land use link. In its Final Environmental Impact Report/ Environmental Impact Statement (EIR/EIS), the CHSRA identifies the benefits of increasing development densities near proposed stations. The Authority set forth principles for selecting station locations that include a preference for traditional city centers and an expectation that local governments adopt station area policies that require transit-oriented development.

Finally, the Federal Transit Administration (FTA) also evaluates the extent of transit-supportive land uses and economic development opportunities when considering funding for new transit expansion projects.

## Governance

Consideration of new or expanded rail services raises opportunities to explore ways to make the regional system work more efficiently. While there is no "ideal" number of transit operators for the Bay Area, having some two dozen separate operators clearly complicates the task of providing a seamless regional transit system. The region should seriously evaluate the benefits and costs associated with merging transit agencies and/or consolidating functions to improve cost-effectiveness and service design. Functional consolidation would pool limited funds, promote uniform fares, and provide more responsive regional service. It also offers potential economies of scale in terms of joint purchases, maintenance facilities, and marketing and customer services. Drawbacks of consolidation include perceptions that local interests may not be served and potential application of higher-wage urban labor cost structures to suburban services that currently have lower labor costs. A critical examination of the current institutional arrangements may help to illuminate common interests, potential for joint-use, financial leveraging, and operational efficiencies as well as offer alternatives to manage, operate, and govern the Bay Area's regional rail systems.

The Bay Area currently has four providers of regional passenger rail services: Caltrain, BART, ACE, and Capitol Corridor. Alternative governance structures that could be applicable to Northern California include:

- Decentralized — the Northern California status quo
- Regional Federation — such as Chicago or San Diego
- Regional Rail Authority — similar to the Southern California Regional Rail Authority

- Consolidated Regional Rail — used in New York City, Boston, Washington, D.C. and Philadelphia

As part of this study effort, two workshops were held with executives and elected officials representing Bay Area rail operators. The workshops resulted in the identification of priority issues for improvement of the delivery of services, consideration of alternative governance models potentially applicable to Northern California, and initiatives which could be undertaken with increased coordination and funding of rail services.

## Funding

The Bay Area's investments in its current transportation are substantial, and keeping it in good working order is even more so. Our existing road and transit systems face a whopping $17 billion maintenance and operating funding gap over the next 25 years. The challenge will be to squeeze every penny and invest strategically and wisely in our network.

MTC's Resolution 3434 rail projects currently cost about $10 billion to build. The rail projects in this plan add another $35 billion. With limited funding, every dollar invested in rail needs to achieve the highest possible benefit. Funding needs go beyond the capital cost of rail investments to include considerable operating and maintenance costs.

By establishing a comprehensive long-range plan and identifying the total level of investment potentially required, the Regional Rail Plan can provide a target for full funding of rail transportation at the regional level. This is the first step in forging a regional consensus behind a program of projects. Such consensus is essential to advocating for and pursuing federal, state, regional and local sales tax funding, and ultimately delivering high-priority rail expansions. The regional rail funding program would need to be complemented with commensurate investments in local transit to provide a complete transit option including the "last mile" of travel to and from the rail station.