

Caltrain Rapid Rail Study Implementation Plan

Summary

In late 1997 the JPB began work on the Caltrain Rapid Rail Study. The study's purpose was to develop a strategic plan for Caltrain capital improvements between 2000 and 2010. The Rapid Rail Study evaluated the railroad's existing facilities and major expansion projects proposed over the years. The objective was to consider all the potential capital improvements in a single plan. Following this analysis, the Rapid Rail Study prioritized specific improvement programs using goals and objectives from Caltrain's Strategic Plan.

The Draft Rapid Rail Study was released to the public on October 1, 1998. Between October 1998 and February 1999 the JPB received over 200 written comments and many oral comments at meetings held to discuss the study and at regular JPB meetings. These comments were used to revise the draft study's recommendations. The revised recommendations were adopted by the JPB at the ____ 1999 meeting and are summarized in this document.

This Implementation Plan will serve as the final study report. The draft study, Chapter 16 on the Caltrain Downtown San Francisco Extension Project status, and the response to comments document will serve as appendices to the report.

1. Implementation Process

The purpose of the Caltrain Rapid Rail Study was to set forth a long-term strategic plan for Caltrain physical investments. The distinction between a strategic plan, such as the Rapid Rail Study, and a programming document, such as the annual capital improvement program, is critical to fully understand the implementation process.

The Rapid Rail Study was designed to identify an overall direction for *capital improvements* based on Caltrain's Strategic Plan (which considered *all* aspects of Caltrain service). The projects described in the Rapid Rail Study have been defined at the conceptual planning level, the next step in the process will be to develop more detailed plans for specific projects and to incorporate them into specific funding programs.

Developing these detailed designs and funding plans will be completed every year during Caltrain's annual capital improvement (CIP) programming process. In the CIP process specific projects are identified and compared to near-term funding availability. Projects are prioritized based on their importance to Caltrain (using the Caltrain Strategic Plan's goals and objectives) and the requirements of the particular funding programs.

A staff working group with representation from all three JPB member agencies completes the CIP process. The staff recommendations are presented to the JPB for their input and approval. The recommendations follow the normal cycle for JPB actions including public input, discussion before appropriate advisory committees, and coordination with impacted local jurisdictions.

Finally, with respect to closing grade crossings and consolidating stations, the Rapid Rail Study does not recommend any immediate actions. Instead, the study simply recommends that these types of actions be considered as Caltrain develops long-term improvement plans for areas. For example, part of reconstructing track through a particular area would include working with a city to determine if it is possible to reduce the number of grade crossings or consolidate stations in the segment. Due to their high sensitivity a very complete public process involving the impacted city, neighbors and businesses would take place before any action was considered. These types of changes are difficult to make, but they can have very significant benefits to the railroad so it is important that they be considered as part of long-term planning. Revisions to the draft recommendations for grade crossings and station consolidation are presented below.

2. Implementation Plan

The purpose of the Caltrain Rapid Rail Study was to develop a comprehensive approach for improving and expanding the railroad's physical infrastructure. The intent was to focus on how capital improvements to the physical infrastructure could improve Caltrain travel times and therefore attract more riders to the system.

The Rapid Rail Study was the first comprehensive analysis of Caltrain's rehabilitation needs completed since the JPB purchased the right of way in 1991. Caltrain's service and ridership has grown dramatically over the past seven years, however, its aging physical infrastructure and rolling stock is placing limits on the ability to further increase service. The study's main finding is that the railroad needs significant rehabilitation.

While the railroad requires a significant investment to reverse decades of deferred maintenance, it does own a priceless asset – a transportation corridor through the heart of a densely developed urban setting. Caltrain's exclusive right-of-way has the ability to provide a fast, safe, reliable and convenient way to travel along the Peninsula. Furthermore, Caltrain's inherently simple and flexible commuter rail technology is ideally suited to meeting today's transportation needs and can be significantly improved at a very low cost (relative to other highway and transit improvement projects).

Finally, it is important to reemphasize that the Rapid Rail Study recommendations simply present a long-term strategic plan for improving Caltrain. A significant amount of work remains to be done to implement the recommendations, including service planning, engineering, and fund programming. As with any strategic plan, the Rapid Rail Study recommendations will need to be revisited on a regular basis to refine and revise plans based on changes to Caltrain's markets and operating environment.

The Rapid Rail Study's recommendations are outlined below.

2.1 Adopt a fiscally constrained capital improvement plan.

The Draft Rapid Rail Study recommended an aggressive \$559 million program of improvements including rehabilitation, enhancements and beginning work on a design-build-procure process for electrification of Caltrain.

Approximately \$260 million in local funding would be needed to complete this program. Under the JPB's existing formula (capital expenses for replacement and enhancement projects are shared equally among the three member agencies) approximately \$86 million would be needed from each county.

The member agencies and regional funding authorities recommended that Caltrain develop a capital program constrained to include only local funds sufficient to match federal and state funds programmed to the JPB. Table 1 compares the constrained financial program to the aggressive program recommended in the draft Rapid Rail Study.

As shown in Table 1, under the fiscally constrained funding scenario significantly less money is available for funding improvements than assumed in the draft report (approximately \$343 million rather than \$559 million). The difference between the two program budgets is the degree of local funds available.

The funds used to match federal and state grants would come from several sources including locally controlled state funding and local sales tax measures. Each county would have the flexibility to determine exactly what source of funding would be used to meet the matching requirement.

Funding Program	Financially Constrained Program	Draft Rapid Rail Study
Federal Section 5307 – Track Rehabilitation	\$75.0	\$75.0
Federal Section 5307 – North /South Terminals	32.5	32.5
Federal Section 5307 – MTC Resolution 1876	120.1	120.1
TEA – 21	28.0	28.0
State – PUC 130 Program	10.5	10.5
State – Bridge Program	5.0	5.0
State – Interregional Program	8.0	8.0
Local Match	63.9	280.0
Total Funding Available	\$343.00	\$559.10

2.2 Assign highest priority to systemwide rehabilitation and capacity increasing projects.

Following development of the constrained funding program, the capital projects recommended in the Draft Rapid Rail Study were re-prioritized to meet the reduced funding level. The SCC recommends completing systemwide rehabilitation projects and projects that will enable Caltrain to increase service with funding from the federal, state and local match dollars. Table 2 presents the project categories in the capital improvement plan.

The systemwide rehabilitation improvements includes the projects in the rehabilitation category from the Draft Rapid Rail Study as well as rehabilitation of the signal system, the San Jose terminal and the San Francisco terminal. The systemwide capacity improvements consist of the sections of third track, signaling improvements and the Palo Alto turnback – all of which will enable Caltrain to operate more frequent service in the most important markets.

The recommended capital improvements would be constructed over a seven to ten year period. The specific funding programs that would be used for the projects as well as design details will be developed as part of Caltrain's annual capital improvement programming process described above.

Project Description	Amount	Notes
Systemwide Rehabilitation		
Safety Priority Projects	\$40	Signal system, track and other time sensitive improvements.
Track Replacement	128	Rebuild track where necessary.
Structures Replacement	52	Rebuild bridges and tunnels.
Signal Replacement Program	39	Rehabilitate existing CTC system and construct fiber optic communications system.
San Jose and San Francisco Terminal Reconstruction	27	Rehabilitate tracks and signals in terminals.
Subtotal – Rehabilitation	\$286	
Systemwide Capacity Improvements		
3 rd Track: Burlingame	\$16	AM Northbound Express Service
3 rd Track: San Mateo (South)	13	AM Southbound Express Service
Palo Alto Turnback	13	Additional Santa Clara County Trains
Cab Signaling	15	90 MPH Operations & Safety
Subtotal – System Capacity Category	\$57	
Grand Total –Rehabilitation and Capacity	\$343	

Striking a Balance Between Service Impacts and Construction Costs

Completing construction projects on an operating railroad is a challenging endeavor. Performing the system rehabilitation and improvement projects will have an adverse impact on service. If service impacts are kept to a minimum construction costs will soar. If service is heavily disrupted ridership will be impacted and customer dissatisfaction climbs. The SCC believes that to achieve a reasonable compromise between service impacts and construction costs most of the rehabilitation and improvement work will need to be performed at night and on weekends (similar to the approach used in the Ponderosa project). This compromise allows rehabilitation and improvement projects to be performed at moderately higher costs but preserves the high-value weekday peak period ridership. This will mean that weekend and night service levels will remain approximately the same as they are today until improved signaling and other critical improvement projects are completed.

Systemwide Rehabilitation Program

Consistent with Caltrain's Strategic Plan goal to improve customer service and safety, the systemwide rehabilitation program – comprising a set of projects to keep the railroad operating safely and reliably – is Caltrain's highest priority. This includes the following programs:

- **Safety priority program.** This includes signal system replacement and systemwide annual rehabilitation projects (trackwork and structures). These projects must be completed soon in order to keep the railroad operating; together they cost approximately \$40 million.
- **Track replacement program.** This includes reconstructing track and grade crossings where necessary. These projects will address years of deferred maintenance on the rail infrastructure and are necessary to enable Caltrain to improve track speeds to 79 – 90 mph. The speed increase will reduce Caltrain running times by approximately 7%, which will increase ridership. The cost of these projects is approximately \$128 million and includes support facilities for construction and maintenance of way projects.
- **Structure replacement program.** This includes replacing bridges, culverts and other major structures. Similar to track replacement, these projects will address years of deferred maintenance and are necessary to keep Caltrain operating. The cost of these projects is approximately \$52 million.
- **Signal replacement program.** This includes replacing the existing CTC system between San Francisco and Bayshore and between Santa Clara and San Jose. The CTC system in these two areas needs additional capacity and will reach the end of its useful life during the time period under consideration for the Rapid Rail Study. The signal replacement program will be coordinated with implementation of capital improvements at the San Jose and San Francisco terminals to increase capacity, system reliability and terminal speeds. The cost of this program is approximately \$39 million.
- **San Jose and San Francisco terminal rehabilitation program.** This program consists of rebuilding the track, yard and employee facilities in the San Jose and San Francisco terminals. The track in both terminals is nearing the end of its useful life and needs to be reconfigured to improve the system reliability and terminal speeds. The San Jose terminal work will be coordinated with the Santa Clara Valley Transportation Authority's Vasona Corridor LRT project. The cost of this program is approximately \$27 million.

Systemwide Capacity Improvement Program

Following rehabilitation of the railroad track, signaling system and structures, Caltrain's next highest priority is improvements that will enable Caltrain to increase capacity by operating more frequent trains. This program includes the following projects:

- **3rd Track – Burlingame.** This project consists of building a third track that will allow express trains to pass local trains. It would be located between the Millbrae and San Mateo stations. The 3rd track project would also involve constructing new platforms at the Broadway and Burlingame stations. The Broadway platforms would be relocated to reduce traffic impacts at Broadway and Caltrain would work closely with the city to make transportation improvements in the Burlingame station area (including potential grade crossing consolidation) as part of this project.

The cost of the 3rd track project is approximately \$16 million. The cost of the station improvements is estimated at \$25 million (to be funded separately).

- **3rd Track – San Mateo.** This project consists of building a third track that will allow express trains to pass local trains. It would be located between 9th Avenue in San Mateo and Hillsdale Boulevard. The 3rd track project would also involve constructing new platforms at the Hayward Park station (which has been designed to easily enable this change) and consolidating the Hillsdale and Bay Meadows station (including a potential grade separation project for 25th Avenue). Caltrain would work closely with the city and impacted businesses on the station consolidation/ grade separation project. The cost of the 3rd track project is approximately \$13 million. The cost of the station improvements and grade separation project is estimated at approximately \$50 million (to be funded separately).
- **Turnback /3rd Track – Palo Alto.** This project consists of building a third track that would function as a turnback to allow more frequent service either north or south of the station. The track may be lengthened to serve as a 3rd Track by extending it through the California Avenue station. The turnback project would also involve constructing new platforms at the Palo Alto station. Caltrain would work closely with the city and Santa Clara VTA on final design for this project. The cost of the turnback project is approximately \$13 million. The cost of the station improvements is estimated at \$5 million (to be funded separately).
- **Cab Signaling.** This project consists of installing cab signaling on the JPB owned track. Cab signaling and automatic train stop equipment is the next level improvement to the signaling system over centralized traffic control (CTC). Cab signaling and automatic train stop equipment will enable Caltrain to operate at up to 90 MPH and will increase overall system safety at all speeds. The cost of the cab signal/ automatic train stop project is approximately \$15 million.

Existing Caltrain Capital Improvement Projects

In addition to the capital improvement projects recommended in the Rapid Rail Study, there are several capital improvement projects that have been programmed for implementation during the next several years. This program includes the following major projects:

- **Caltrain 1999 Rehabilitation Program (Ponderosa).** This project consists of many different rehabilitation projects from San Francisco to San Jose including track replacement, structure rehabilitation, station construction and signaling improvements. The total cost of this project is approximately \$63 million (the construction contract itself is approximately \$45 million).
- **Caltrain Maintenance Facility.** This project consists of constructing a new Caltrain rolling stock maintenance facility at the Lenzen site in San Jose. It includes acquisition of the property, design of the facility and construction. The cost of the maintenance facility project is approximately \$67 million. Caltrain is currently in the process of negotiating for property and beginning the process of detailed design.
- **Centralized Traffic Control.** This project consists of installing centralized traffic control (CTC) and high-speed crossovers on the approximately 40 miles of the system currently without CTC (from Bayshore to Santa Clara). Installation of CTC will enable Caltrain to improve safety,

system reliability, train frequency and speed. Furthermore, it will enable Caltrain to complete other construction projects much more efficiently; therefore it is critical to the overall success of Caltrain. In addition to the signal system itself track reconfigurations, including strategically located high-speed crossovers, are necessary to take advantage of the system. In addition, the communications system will be upgraded with the fiber optic system currently being installed. The cost of the CTC project is approximately \$35 million. Caltrain is currently developing the preliminary design for the CTC system.

- **Millbrae Intermodal Station.** This project consists of constructing Caltrain facilities at the new Millbrae Caltrain – BART intermodal station. The facilities include a third and fourth Caltrain boarding platform and associated track and crossovers to allow efficient and flexible operation of the new station. The cost of the Millbrae station project is approximately \$18 million.

2.3 Amend JPA to distinguish between Systemwide and Local Projects for funding purposes.

The Rapid Rail Study identified many important station improvement projects that will improve station safety, convenience, access and amenities. These improvements include constructing outside boarding platforms, rebuilding station track and signal systems, relocating stations and multimodal access improvements. The cost of this program was estimated at \$205 million in the draft Rapid Rail Study (station enhancements and access improvements).

Given the level of funding available for implementation of the Rapid Rail program, it was impossible to provide funding for these projects. Therefore, the Peninsula Corridor Joint Powers Agreement (JPA) will be amended to distinguish between two types of projects for funding purposes. The two types of projects and their funding priorities are:

- **Systemwide** – Systemwide projects are track, signals, structures, rolling stock, maintenance facilities, and terminals. This would include capitalized repair of station facilities (e.g. roof repair, parking lot overlays and station lighting modifications). Systemwide projects will have highest priority for federal, state and regional funds. Local matching requirements will be defined in the Joint Powers Agreement (member agencies will have flexibility in the type of funds provided as local match).
- **Local** – Local projects are station projects that involve major improvements to stations. These would include improved or expanded parking facilities and transit access, grade separated pedestrian crossings, outside boarding platforms, and other major reconfigurations, these types of projects will be the responsibility of individual member agencies although member agencies will have flexibility in the type of funds that they use for these projects.

The specific definition of system versus local projects, and related responsibilities, will be defined by member agencies and included in the Joint Powers Agreement. Among the issues to be addressed are:

- Responsibilities and funding for major repairs and replacement of station facilities;
- Responsibilities for station planning and potential joint development opportunities;
- Responsibilities for community outreach regarding station issues and projects;
- Coordination of local projects with station standards and systemwide plans (e.g. ADA);
- Priorities and timing for outside boarding platforms in relation to track rehabilitation;
- Coordination of funding of station projects with system improvements.

This recommendation is a significant change from the JPB's current formula for funding capital improvements equally between the three Member Agencies for replacement and enhancement type projects. The recommended approach would allocate *systemwide* costs among the three counties according to the capital improvement funding formula included in the JPA, but allocate major station improvement costs to the counties they are located within. This approach will provide Member Agencies with more local control over the level of station improvements within their county.

The JPB is in the process of developing station standards that specify what is required for stations. These requirements will include a description of the improvements necessary to ensure that the station is fully compatible with the railroad's needs in terms of safety, convenience and operations (including maintenance costs).

2.4 Reaffirm commitment to increased service levels specified in the Caltrain Strategic Plan.

The Rapid Rail Study was based on service level assumptions adopted by the JPB in the Caltrain Strategic Plan. Therefore, as part of adopting the Rapid Rail Study, the SCC recommends that the JPB reaffirm its commitment to operating the future service levels specified in the Caltrain Strategic Plan including support for additional service to Gilroy.

The actual level of service that can be operated by Caltrain depends on the following three variables:

- **Rail Infrastructure** – The ability to operate a given number of trains at a given level of quality depends upon the condition of the facilities and tracks. As service increases Caltrain will need additional facilities including an improved maintenance shop, sections of third track and improved signaling. The purpose of the Rapid Rail Study was to identify those capital improvements necessary to operate increased service.
- **Rolling Stock** – The number of trains that can be operated at any one time depends upon the number of vehicles available. While the Rapid Rail Study did not include a detailed analysis of future rolling stock needs, it did define two levels of future service for use in identifying capital facility needs. Tier 2 service was defined as the rolling stock currently on order and Tier 3 was defined as a much higher level of service. The Rapid Rail Study recommended revising Caltrain's Fleet Management Plan to determine the actual rolling stock necessary to operate increased service in Tier 3.
- **Operating Funding** – Perhaps the most significant element in determining Caltrain frequency is the level of operating subsidy provided by member agencies. It is not possible to quantify exact levels of subsidy necessary to operate future levels of service since the subsidy will depend upon contract provisions with the service provider (the contract is re-negotiated every several years), ridership (fare revenue) and very specific schedule information. However, increasing service will increase the amount of operating subsidy required and therefore increase operating funding requirements from member agencies. Determining the operating subsidy is a political decision outside the control of the Rapid Rail Study to define.

Table 3 summarizes the proposed future service levels with their corresponding rail infrastructure investments, rolling stock requirements and operating and maintenance costs. It is impossible to specify exactly what level of service will be provided in the future until all three of these variables are defined in

more detail. However, once the new rolling stock currently on order has been received, the rolling stock rehabilitation program is complete and the new maintenance facility is in operation, Caltrain will have the capacity to operate at least 98 trains per day.

Description	Existing	Midday	Tier 2	Tier 3	Long-term
Daily Trains	66	80	98	114	Over 114
Service Increase	--	Increase midday service	Increase peak service & more frequent Northbound AM express trains	Increase peak service & more frequent Southbound AM express trains	To be determined based on passenger demand.
Caltrain Strategic Plan Horizon	Short-term	Mid-term (3 to 10 years)	Long-term (11 to 20 years)	Long-term (11 to 20 years)	Long-term (11 to 20 years)
Capital Improvements	Existing	Increased Maintenance Capacity	Track, structure and signal system rehabilitation, Maintenance Facility, 3 rd Track (Burlingame)	3 rd Track (San Mateo)	Electrification, Extension projects
Rolling Stock	73 Passenger 20 Locomotives	73 Passenger 20 Locomotives	+ 20 Passenger + 3 Locomotives	To Be Determined in Fleet Plan	To Be Determined in Fleet Plan
Operating and Maintenance Cost	Existing	Moderate increase (+) (See Note)	++ (See Note)	+++ (See Note)	+++ (See Note)

Note: The exact amount of operating cost increase can only be determined when actual schedule is developed and negotiations with operating contractor are completed.

2.5 Defer electrification until additional funding is available.

The Draft Rapid Rail Study recommended that the JPB pursue electrification on a fast track using a design/build/procure approach to the project. The intent was to develop a solid engineering proposal and price for the electrification project and to seek funding for electrification as part of the Bay Area's next regional rail planning program.

Upon consideration of Caltrain's other capital needs and the lack of available funding from any sources for electrification, electrification will be deferred until a solid source of funding can be identified for the

project and system rehabilitation is completed. In the meantime, capital projects completed on the railroad will be designed to be consistent with future electrification to the maximum extent feasible. Electrification will remain a long-term goal for Caltrain, but will not be pursued until significant additional funding is identified and programmed for the project. The key reason for deferring electrification is simply that there is not enough money to complete the project given Caltrain's rehabilitation needs.

2.6 Grade Crossing and Station Consolidation Recommendations

The Rapid Rail Study evaluated Caltrain's infrastructure from a strategic perspective. Two important recommendations were that grade crossings be closed and that stations with very low ridership be consolidated or closed. As expected both types of recommendation were very controversial with communities directly impacted by the changes. The Rapid Rail Study's recommendation was that these closings and consolidations be considered as part of the improvement process, not that they would be implemented immediately.

Grade Crossings – Caltrain, the Federal Railroad Administration (FRA) and the California Public Utilities Commission (CPUC) all recommend that grade crossings be closed to improve safety. Therefore the Rapid Rail Study recommends that pedestrian and vehicle grade crossings should be eliminated whenever possible through grade separation projects or closings.

Grade separation projects and closing grade crossings will both have impacts on communities. Caltrain will work with cities, the FRA, the PUC and local agencies to develop mutually acceptable plans for addressing grade crossing safety.

No immediate action is planned on closing any grade crossings. Instead, as Caltrain develops plans for reconstructing track through a particular area, Caltrain would work with the impacted city to determine if it is possible to reduce the number of grade crossings in the segment. Due to their high sensitivity a very complete public process involving the impacted city, neighbors and businesses would take place before any action was considered. This process would include working closely with impacted citizens including bicycle riders (since they may be more adversely impacted by a closure than vehicles) and businesses as well as JPB member agencies. The following highway grade crossings will be considered for closing as part of this process:

- King Street (San Francisco) – This crossing will be replaced with Mall Street.
- Scott Street (San Bruno).
- North Lane (Burlingame) – Burlingame has asked to work closely with Caltrain on this project.
- South Lane (Burlingame) – Burlingame has asked to work closely with Caltrain on this project.
- Villa Terrace (San Mateo) – San Mateo has asked to work closely with Caltrain on this project.
- 2nd Avenue (San Mateo) – San Mateo has asked to work closely with Caltrain on this project.
- Maple Street (Redwood City) – Redwood City would be willing to consider this as part of a larger consolidation project with Main Street.
- Stockton Avenue (San Jose) – Must address business access issues.
- Lenzen Avenue (San Jose).

Grade Separation Projects – Two types of grade separation projects were considered in the Rapid Rail Study, pedestrian crossings and highway crossings.

The study recommends constructing grade-separated pedestrian crossings at stations when stations are significantly rehabilitated and where they can be constructed cost effectively

The study recommended funding for only one highway grade separation project, 25th Avenue in San Mateo. This project was proposed as part of 3rd track construction and consolidation of the Hillsdale and Bay Meadows stations and would be funded from the San Mateo County Transportation Authority's grade separation program and is supported by the city of San Mateo.

All other grade separations would be considered as long-term projects and no funding has been identified or programmed for any of these projects. The following information was received from cities with respect to the grade separation projects described in the Rapid Rail Study:

- 16th Street (San Francisco) – San Francisco recommends adding as a long-term project, no funding was identified for this project.
- Broadway (Burlingame) – Burlingame recommends dropping from recommendations.
- Castro & Rengstorff (Mountain View) – Mountain View will work with Caltrain on concepts.
- Charleston (Palo Alto) – Palo Alto supports grade separations for bicycles and pedestrians not full vehicular separations.
- Whipple & Broadway (Redwood City) – Redwood City is opposed to these separation projects.
- Downtown San Mateo crossings – San Mateo believes that these will be difficult crossings to construct and will require careful planning and public review.
- Oak Grove (Menlo Park) – Menlo Park expressed concerns about this grade separation project.

Station Consolidation and Closings – Closing or consolidating stations with relatively low ridership reduces Caltrain costs (capital and operating) and can actually increase system ridership by reducing train travel times. The Rapid Rail Study recommended considering closing or consolidating six stations. Most of the public comments received on the study recommended against closing a given station. The following stations are recommended for consolidation or closure:

- Bay Meadows – consolidate with Hillsdale.
- Castro (Mountain View) – replace with new San Antonio station.

