
5.0 Financing the System

5.0 Financing the System

■ 5.1 Introduction

A detailed financial analysis was conducted as part of the *Institutional Analysis and Financing Options Evaluation*. The goals of this analysis were to determine the financial feasibility of high-speed rail in California, to assess a wide range of funding sources, to determine the likely degree of private sector participation in the project, and to devise a legally and practically achievable financing plan.

If the current low cost of the competing transportation modes continues in the future, it is unlikely the high-speed rail system could demand high enough fare or capture sufficient market share to generate excess revenue adequate to serve as a base funding source. Although the system is projected to generate revenues well in excess of operating costs, it will not provide a return on investment at the level needed to attract private investors. However, the system will leverage enough financing to pay for much of the costs of developing the extensions.

Because the net system revenues are insufficient to attract private investment or leverage enough financing to develop the entire system, it is necessary to look to a public source for the base funding. Utilizing a public funding source has the advantage of making the bonds eligible for tax exempt status (providing the project meets other criteria), thus substantially reducing the financing costs of constructing the system.

Given the need for a base funding source to supplement system revenues, publicly-backed revenue bonds are a far more attractive option than private sources. Being tax-free and government-backed, public bonds can offer lower interest rates and still attract investors. Private sector financiers would demand a far greater return on investment, given the risks inherent in such a large project, resulting in higher borrowing costs and de facto financial infeasibility.

In short, high-speed rail is financially feasible with use of one of several public base funding sources (corridor sales tax, statewide sales tax, or gas tax). Supplemental funding sources such as system revenues, vendor/developer financing, and local contributions can decrease the need for public funds from the base source and should be employed to the greatest extent possible.

The remainder of this chapter discusses the different available funding sources, explains the financial model used, and presents the financing plan options. The chapter is organized as follows:

- Overview of Non-Operating Revenue Funding Sources;
 - Base Funding Options
 - Major Secondary Funding Sources
 - Supplemental Funding Sources
- Operating Revenues;
- Financial Model and Assumptions; and
- The Financial Plan.

■ 5.2 Overview of Funding Sources

The high-speed rail system will depend upon a three-tiered financing plan (see Figure 5.1) to supplement surplus revenues from system operation (i.e., farebox revenues, freight revenues, and station concession revenues). The three tiers represent the extent to which the funding source can be relied on as the primary funding source and its relative contribution to the overall financing package.

Base Funding Sources – Base funding sources will provide the primary funding for construction of the system (about 70-85 percent). In order to qualify as a base funding source, the source must be able to substantially finance the construction of the system, secure debt against the revenue source, and provide funding irrespective of the construction status or operational readiness of the system. In addition, the source must have a stable and reliable revenue growth potential.

Major Secondary Funding Sources – By definition, secondary funding sources are not of themselves or in combination sufficient to finance the construction of the system. They will, however, provide for significant construction and operational revenue and, in combination with the base funding source, constitute a valuable contribution to the system's financing (on the order of 1-2 percent for each source).

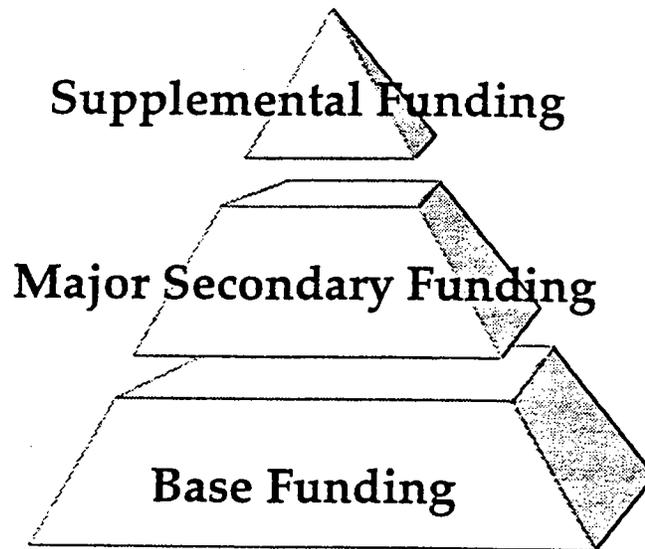
Supplemental Funding Sources – Supplemental funding sources, the uppermost tier in the project financing pyramid, also will not of themselves provide sufficient revenue to construct the system but can provide an important incremental contribution to the system's financing (less than 1 percent for each source).

5.2.1 Base Funding Options

Seven options were considered for the base funding source including:

1. A 5 to 8 cent increase in the statewide gasoline tax (the amount depends on the technology selected and whether the extensions are included);

Figure 5.1 Types of Funding



Source: Public Financial Management, Inc.

2. A 1/4 or 3/8 cent increase in the statewide sales tax (again, the amount depends on the technology and extensions);
3. A 1/2 cent increase in the sales tax of those counties within the rail corridor;
4. A \$2.00 per passenger fee at each of California's commercial airports;
5. A \$4.00 toll on Interstate 5;
6. Funding from the Federal Government; and,
7. Funding from the existing State Transportation Improvement Program (STIP).

As discussed later in this section, only the sales and gas tax options provide a realistic means of funding the project. The base funding options are discussed below.

Note that the Revenue and Taxation Code requires any proposal to increase gas or sales tax, or create a new tax, would require a two-thirds majority vote of all members of each house of the Legislature and approval by the Governor. It is unclear if the Legislature can impose a sales tax increase in some counties and not in others. Alternatively, a simple majority of the statewide electorate would be sufficient to increase a tax should it be presented as an initiative measure on the State ballot.

Additionally, passage of a statewide general obligation bond measure would require a two-thirds vote of the Legislature to place the measure on the ballot and approval by a simple majority of the qualified voters. The law is unclear regarding the approval requirements for revenue bonds supported by gas tax or other revenue sources.

Sales Tax

Sales tax revenue bonds have been commonly used by transportation agencies to fund capital improvement programs in California. Two sales tax options were considered under this option.

The first option is a 1/2 cent sales tax increase in only those counties which lie within the proposed high-speed rail corridor. The rationale is that these counties are likely to enjoy the most benefits from the project and, as such, should bear the largest financing burden. Based on pre-recession growth levels in sales tax revenues, the 1/2 cent sales tax increase would generate over \$655 million every year. Most of this revenue would be generated by Los Angeles County, which would contribute approximately \$400 million annually. This funding source would support \$10.2 billion in bonds, resulting in over \$9.1 billion in proceeds for high-speed rail system projects.

The second option is a statewide increase in the sales tax. A 1/4 cent increase would have resulted in over \$715 million in revenue in 1994. Again, assuming an annual sales tax revenue growth rate of 4 percent, this option would generate over \$743 million a year for high-speed rail financing. Assuming an annual growth rate of 4 percent, over the life of the project, this option could support \$11.9 billion in bonds, from which \$10.6 billion would be available for high-speed rail projects. This statewide sales tax option can adequately fund a high-speed rail system plus the proposed extensions with VHS technology. If Maglev technology were selected, the statewide sales tax would need to increase by 3/8 of a cent to generate sufficient funds.

Gas Tax

This tax would be applied to each gallon of gasoline, including diesel fuel, sold in California. Currently, the gasoline tax for the State is \$0.18 per gallon. Based on historical levels of gasoline sales, a 5 cent increase in the gas tax would have produced over \$767 million in revenue for the year 1995, an amount that can be expected to increase 2.5 percent annually. Assuming a debt service coverage level of 1.3x¹, and a term of 30 years, a 5 cent gas tax can support over \$10.1 billion in debt. After satisfying financing costs, this would leave \$9.0 billion to fund high-speed rail project costs, enough to cover the basic VHS system. If the extensions were added, the gas tax increase would rise to six additional cents per gallon. With Maglev technology, the gas tax increase required would be 6 cents per gallon to fund the basic system and 8 cents per gallon if the extensions were included. However, project revenue would support most of the cost of the extensions in

¹Coverage is a term usually connected with revenue bonds, and is the margin of safety for payment of debt service reflecting the number of times (e.g., "120 percent coverage" or "1.2x") by which annual revenues either on a gross or net basis exceed annual debt service.

either case. It is important to note that once the bonds are retired, the net operating revenue would be available for other purposes such as improving or expanding the system, or may be directed to other state programs.

Section 1(b) of Article 19 of the California Constitution limits the purposes for which gas tax revenues may be used. Allowable uses include planning, research, construction and improvement of exclusive public mass transit guideways as well as facilities in the immediate right-of-way. Article 19 excludes the use of gas tax revenue for mass transit passenger facilities, vehicles, equipment, and services as well as the maintenance and operating expenses for mass transit power systems. Thus, a constitutional amendment would be required if the gas tax were to be relied upon as the sole source of project funding. Alternatively, supplemental funds must be found for high-speed rail operations, vehicles, stations and power facilities.

Individual counties must approve by a majority vote the use of gas tax revenue for mass transit guideway purposes. While the counties in the proposed corridor have approved such use, many rural counties in California have not. While Article 19 excludes the expenditure of gas tax revenues in counties which have not previously approved the use of such revenues for mass transit guideways, it does not preclude the Legislature from imposing a statewide tax for such purpose.

The stability of gasoline tax revenues is a significant factor in assessing the ability to use this source as the primary security for financing. The consumption level of gasoline directly affects the amount of gasoline tax revenues that may be generated. Factors affecting the level of gasoline consumption include vehicle fuel efficiency, gasoline prices, level of disposable income and zero emission mandates. Also, gas tax does not keep pace with inflation. In fact, as the price of fuel increases, consumption decreases resulting in reduced gas tax revenues.

Airport Passenger Facility Charge

The fourth base funding option considered was a fee of \$2.00 on all passengers enplaned in California airports. Over 60 million passengers will be enplaned in California airports in 1995 and 1996. Assuming a conservative annual passenger growth rate of 2.5 percent, potential annual tax revenues from the Airport Passenger Facility Charge would be greater than \$125 million. This option could support over \$1.5 billion in bonds, resulting in approximately \$1.4 billion in proceeds available for construction cost financing. The State would face significant legal challenges in implementing this option under current law, however. According to federal law, airport passenger facility charges can fund only eligible airport-related projects, such as terminal development or baggage and passenger transport within the airport.

Highway Tolls

Another option for the base funding source is the imposition of one or more highway tolls. The hypothetical toll of \$2.00 in each direction would be collected from all vehicles on Interstate 5 at Los Baños and the Grapevine. Based on average daily traffic counts at each of these points, assuming no diversion from existing traffic levels and a hypothetical annual growth rate of 2.5 percent, these tolls would generate an annual revenue in excess

of \$100 million. This toll structure can support over \$1.2 billion in debt, generating over \$1 billion in proceeds for high-speed rail construction costs. This funding source would also meet with serious legal and institutional obstacles, however. For example, Federal regulations currently prohibit tolling on Interstate facilities for non-highway purposes.

Federal Funding

Federal funding opportunities for high-speed rail are limited. In the arena of a reduced overall transportation budget, high-speed rail must compete with other transit programs for federal funding. Nevertheless, the Federal Railroad Administration maintains an interest in developing high-speed rail, despite a lack of funding. In addition, prospects for the creation of a Unified Transportation Fund offer some hope for federal funding of high-speed rail, should California dedicate a share of its funds for this purpose. At present, however, high-speed rail must depend mainly on state, local, and private funding sources in the absence of substantial federal funds.

While it appears that federal government's involvement with high-speed rail will remain small, some potential federal funding sources for state and local high-speed rail programs do exist. The Federal government is expected to allocate somewhere between \$15 million and \$25 million per year through the end of the currently authorized program in 1997.

State Funding

The State Transportation Improvement Program (STIP) is the primary document for programming of Federal and State transportation funds in California. The STIP is a seven year program, adopted biennially by the California Transportation Commission (CTC). The funds programmed in the STIP come from the State Highway Account and from Passenger Rail Bond Fund revenues. The State Highway Account revenues include state gasoline tax revenues and truck weight fees (these total approximately \$1.7 billion and \$500 million per year, respectively) as well as federal highway trust fund revenues apportioned to the State of California (approximately \$1.7 billion annually). An additional source of funds programmed for rail projects in the STIP is rail bond funds made available through the passage of Proposition 116 in 1990. This proposition was a \$1.99 billion voter initiative that allocated specified amounts of money to defined corridors and projects.

With the failure of two Passenger Rail Bond Funds in 1992 and 1994, there is a \$2 billion shortfall in STIP funding for rail projects. The CTC has maintained the State's commitment to the rail program, largely by programming State Highway Account funds, advanced obligation of Federal funds, and by substituting other funds as an interim measure. In addition, as of the Fund Estimate adopted by the CTC in August 1995, there is a \$574 million shortfall in funds for projects programmed in the 1994 STIP.

In light of the current STIP shortfalls overall and, in particular, the \$2 billion shortfall in rail funding, the potential of STIP funding as a base funding source does not appear promising. However, with an approved and adopted high-speed rail implementation plan, some existing rail projects currently programmed in the STIP could potentially be adapted to accommodate future high-speed rail service. Thus, the STIP could serve as a supplemental funding source for specific high-speed rail-related improvements.

Summary

Table 5.1 presents a summary of the base funding options. It is apparent that only the sales and gas tax options provide realistic means of funding a significant enough portion of the project costs to be considered a viable base funding sources. Federal and State funds are excluded from the table because they would provide only minimal amounts of funding relative to project costs.

Table 5.1 Summary of Base Funding Options (Current Dollars)

Option	1995 Revenue (\$)	Bond Par Amount (\$)	Bond Proceeds (\$)	Estimated Annual Debt Service (\$)
Gas Tax	\$767,058,955	\$10,101,123,595	\$8,990,000,000	\$786,427,499
Sales Tax (Corridor)	\$655,317,135	\$10,213,483,146	\$9,090,000,000	\$795,175,302
Sales Tax (State)	\$743,534,248	\$11,915,730,337	\$10,605,000,000	\$927,704,519
Airport Tax	\$125,177,328	\$1,544,943,820	\$1,375,000,000	\$120,282,293
Highway Tolls	\$100,083,000	\$1,205,617,977	\$1,073,000,000	\$93,863,927

Source: Public Financial Management

5.2.2 Major Secondary Funding Sources

Six funding sources were evaluated as candidate major secondary funding sources, including: right of way dedications, benefit assessment financing, tax increment financing, private concession development, project revenue bond financing, local agency contributions, and vendor/developer financing. Of these, right-of-way dedications, local agency contributions, vendor developer financing, and project revenue financing were the most promising and incorporated into the financial plan. The potential major secondary funding sources are described below.²

²Unless otherwise specified, dollar amounts in this section pertain to the VHS system without extensions, assuming gas tax bonds as the base funding source. This scenario was selected to illustrate the magnitude of funding that would be available from the various secondary funding sources.

Right of Way Dedications

Right-of-way dedications are the donation or use of right-of-way that is currently under public ownership and requires no additional compensation. The financial model assumes that without the extensions, 15 percent of the project right-of-way, valued at \$147.0 million, is currently in Caltrans or other public ownership. With the extensions, the assumed value of right-of-way donations is \$255 million. Acquisition costs associated with this right-of-way are not included in the project budget. The other 85 percent of the right-of-way is expected to pass through privately held property with an acquisition cost of \$833.0 million.

Tax Increment Financing

Tax increment financing is a tool for capturing the value of property tax revenue created by development within a specified area, over and above that which existed at the time the tax increment financing district was established. Tax increment financing is the primary type of financing associated with redevelopment districts throughout California. The value of incremental development attributable to the high-speed rail system is estimated at \$87.3 million in aggregate (2002). This estimate is based on incremental development within a half mile of eight potential stations and assumes that approximately 31 percent of the total estimated development is attributable to the project. Note that land use-related taxes have traditionally been under the control of local governments; the State's authority to impose such taxes is uncertain.

Benefit Assessment Financing

Benefit Assessment Financing involves the application of an annual fee to the property owners located within a specific radius of high-speed rail station locations. The fee imposed would be based on the estimated value to the property owners created by the implementation of high-speed rail service. As with tax increment financing, this is a financing mechanism traditionally applied by local governments.

Local Agency Contribution

In-lieu of a State-imposed funding source, it is preferable that local governments be given flexibility to design the funding strategy which best serves their needs. A local funding strategy could include benefit assessment districts, tax increment districts, local transportation sales tax resources or other local resources; funding sources for which there is long-standing precedent at the local level. The financial plan assumes that 50 percent of the station construction costs or \$288.8 million, excluding costs associated with parking facilities, will be provided by local governments.

Vendor/Developer Financing

Systems suppliers use vendor/developer financing to cover capital costs of facilities such as parking structures or food and concession spaces in the stations. These costs are financed separately from the overall system as the facilities covered will benefit private

cessionaires. Another form of vendor financing is in deferred compensation certificates, which would allow the State to defer payments to construction firms and vehicle suppliers over a period of years. The certificates could be backed by tax revenue or system revenue, in which case the vendor would assume some revenue risk.

Because vendor/developer financing involves higher interest rates than typical of tax exempt financing, vendor/developer financing is considered as a supplemental and not a base funding source. The financing plan assumes vendor financing for parking facilities and concession areas within the stations. Private parking concessions would generate an estimated \$144.4 million over a four year period, enough to cover costs associated with parking during the construction phase. An estimated \$2.5 million in concession revenue would be paid by concessionaires on an annual basis beginning in 2005.

Project Revenue Financing

Project revenue financing is a classic financing approach used when the net operational revenues from a project are expected to generate a positive cash flow. Because the high-speed rail system is expected to generate positive cash flow, project revenue financing was considered as part of the financing plan. Project revenue financing would begin in 2005/06, the fiscal year that the system opens for operation.

Net operating income is insufficient to completely fund construction in any of the technology or alignment scenarios. The Los Angeles-San Francisco VHS system would generate enough net operating income to raise only about \$965 million in bond proceeds over the project construction period. However, while project revenue financing cannot finance capital construction costs of the basic system, it can provide a significant source of financing for the extensions. Project revenue financing is therefore included in the financial plan for the alignment scenarios with extensions. For example, project revenue certificates contribute \$2.4 billion towards construction of a VHS system with extensions, assuming a gas tax base for the funding source.

5.23 Supplemental Funding Sources

The supplemental funding sources assessed included U.S./Cross Border Leveraged Leasing of rail equipment, cash flow interest earnings, right of way relocation avoidance, and intergovernmental capital funds. Of these supplemental sources, only the leveraged leasing and cash flow interest earnings were adopted for the financial plan.

Leveraged Leasing of Rail Rolling Stock

This financing mechanism is used when rail rolling stock is acquired by a tax exempt public entity that has no effective use for the tax depreciation value of the equipment. In order to capture this value, various strategies have evolved which allow the transfer of depreciation rights to an entity with tax liability, either domestically or in some other nation. When tax benefits are transferred to a U.S. entity, the transaction is known as a domestic leverage lease. When benefits are transferred to an entity with foreign tax liability it is called cross border leasing. The amount of benefit received in a leveraged lease varies depending on the type of lease structure, age of equipment, remaining useful life, degree of specialization of the equipment, currency considerations, available interest rates, and total size of the transaction. The financial plan assumes that a leveraged lease would generate \$78.3 million in cash for the project. Leveraged leasing can be considered a private funding source for the project.

Cash Flow Interest Earnings

The proposed financial plan generates significant balances of both tax proceeds and bond proceeds during the time of the project construction. Cash balances are estimated to range from \$3.4 million to \$1.8 billion during the construction period. Interest earnings are projected to be \$297 million during the term of construction and can therefore make a significant contribution to project financing.

■ 5.3 Operating Revenues and Expenses

Operating revenues include passenger or farebox revenue, freight revenue, and station concession revenue. The passenger revenue and operating costs are consistent with an SR-99 Base alignment serving San Francisco and Los Angeles with extensions to Sacramento (via Stockton) and San Diego (via the LOSSAN Corridor). The passenger revenues, freight revenues, and operating costs were generated by the *Ridership Demand* and *Corridor Evaluation* studies. As shown in Figure 5.2, the high-speed rail system will generate an operating surplus, with or without extensions, with VHS or Maglev technology.

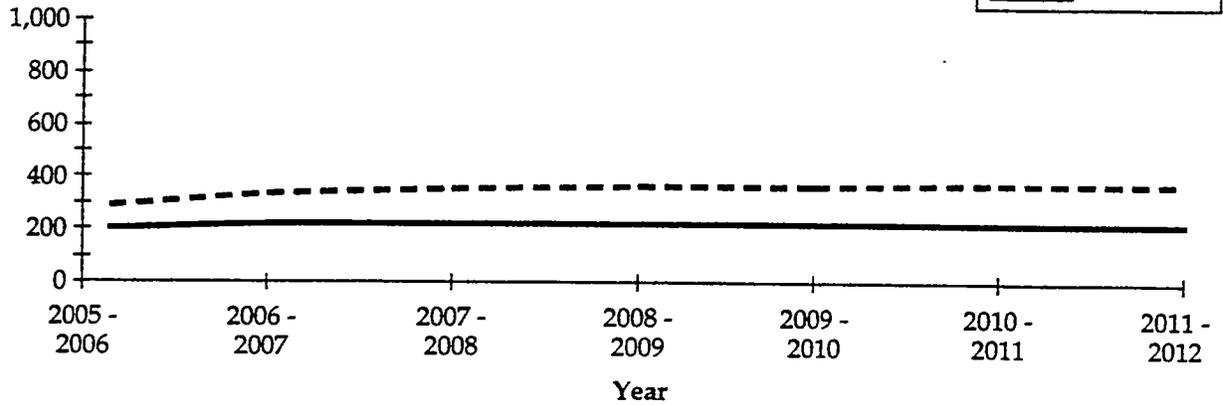
Passenger Revenues

Annual passenger revenue will begin accruing in 2005/06 and are projected to reach \$398 million by the year 2020 for the basic system with VHS technology. Revenues for the VHS system with extensions are projected at \$740 million by 2020.

Figure 5.2 Operating Revenue and Costs

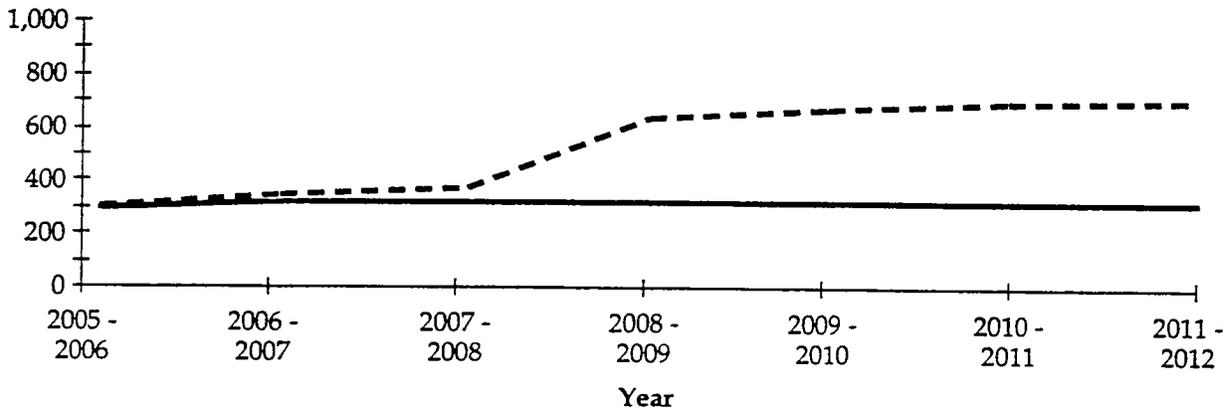
VHS without Extensions

In Millions of Dollars



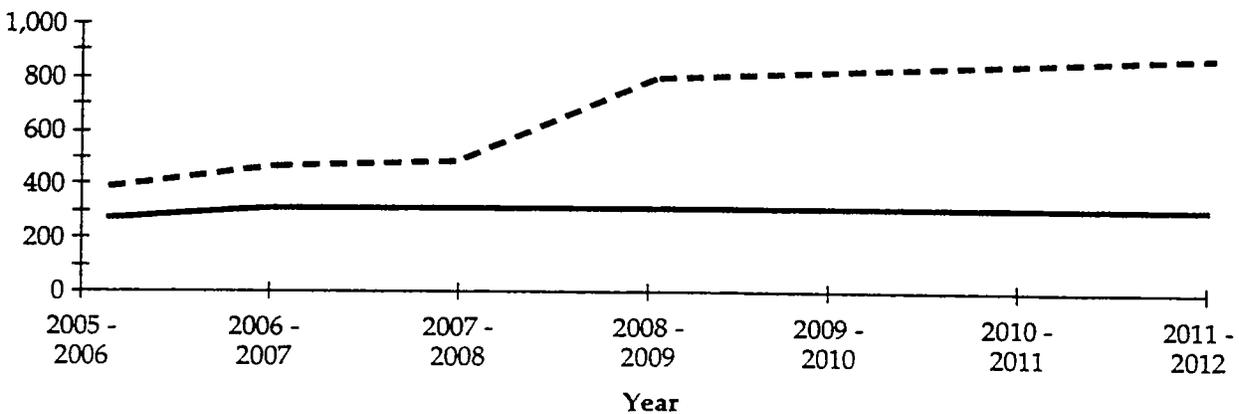
VHS with Extensions

In Millions of Dollars



Maglev with Extensions

In Millions of Dollars



Freight Revenues

The high-speed rail system has the potential to generate significant freight revenue, competing for a specialized freight market valued at \$154 million per year. The financial plan assumes that the system can capture 25 percent of this market starting in the second year of operation (2006/07). Based on projected levels of freight activity, this market share would generate \$57.9 million in annual revenue, a \$20.5 million surplus over freight operating costs.

Station Concession Revenue

Many stadiums and arenas throughout the country have implemented concession agreements. Under this approach, the agency responsible for high-speed rail would bid out a long-term contract with a concessionaire. In exchange, the concessionaire would pay for any capital improvements required at specific stations as well as an annual fee for the concession. Based on historic trends and assumptions, the financial model assumes that \$2.5 million in annual operating revenue could be realized from a concession.

Operating Costs

Operating costs are expected to start at \$200 million for the basic system with VHS technology in the year 2005/06, increasing to \$238 million per year on an uninflated basis. With the extensions, annual operating costs for the VHS system will reach \$315 million. Annual operating costs for a Maglev system with extensions will reach \$321 million.

Operating Surplus

As shown in Figure 5.2, the operating surplus with the extensions is much greater than without the extensions. For example, in the year 2012, operating revenues for a VHS system with extensions are \$307.3 million greater, while operating costs are only \$76.6 million higher.

■ 5.4 The Financial Model

The financing plan options were developed with the aid of a computerized financial model which integrates the various revenue and expenditure streams into a cohesive cash flow. The model helped to assess the viability of different financing alternatives, including the effects of different implementation schedules and interest rate environments. The cost of financing is minimized by maximizing financing mechanisms which incur lower interest rates. For example, senior bonds have a lower interest rate than subordinated bonds, and the interest rate of subordinated bonds is less than project revenue or deferred compensation certificates.

The financial model spreads the estimated capital costs over the project construction period according to the proposed implementation schedule, applying a 4 percent inflation rate to the costs. Revenue receipts, including operating income, are projected over the same period and inflated by a specific inflation factor for each year. Gas tax receipts are inflated by 2.5 percent while sales tax receipts are inflated by 4 percent per year. In any given year, if there are sufficient funds to cover the projected disbursements while maintaining a balance of at least \$500,000, the excess funds are carried over into the following year. If there are insufficient funds to cover projected disbursements, then capital projects are deferred to maintain this minimum cash balance. This mandatory minimum balance assumption tests whether the project implementation schedule is workable.

The model uses gas or sales tax revenue as the base financing mechanism. The model calculates the bond proceeds necessary to maintain a balance greater than \$500,000 without causing any capital project deferrals. The model then calculates the overall bond sizings and introduces debt service that will pay off the bonds over the life of the program.

The bond proceeds accumulate in a "Gross Construction Fund." The model calculates debt service on a level basis for each issue based on a term of 30 years. These sizings also include costs of issuance, insurance and a debt service reserve fund equal to 10 percent of the respective issues, a practice that enhances the security of the bonds. The reserve fund, cash balance from fund source, and unexpended bond proceeds all earn interest which will accrue to the benefit of the project. The cost of issuance is conservatively estimated to be 1 percent of the issue size.

Each bond sizing uses a single interest rate (5.95 percent and 6.45 percent for senior and subordinate debt service, respectively) to determine the estimated annual payments. Each bond issue is also assumed to pay only interest for the first five years. By deferring the repayment of principal, the model minimizes debt service during construction. To determine the ability of the high-speed rail system's authority to issue more debt in the future, the model also conducts an additional bond test to assure a sufficient coverage ratio. This is done by comparing the debt service to the projected amount of base funding source revenues for the corresponding year.

The financial plan for the extended system is very similar to that for the base system, except that project revenue certificates finance the cost of constructing the extensions. The project revenue certificates use the net operating income of the system combined with any residual base funding source revenue as security.

The project revenue certificates used to fund the extensions would be issued in two series with 30-year terms each and would have a minimum coverage ratio of 1.20x. These certificates will be issued in 2007/08 with capitalized interest for the first two years, after which their debt service will be funded by project revenues upon completion of construction of the system.

Deferred compensation certificates are utilized in 2005 under the gas tax base funding scenario for a VHS system without extensions. However, deferred compensation certificates may be used under other scenarios if revenue cashflow is such that the debt service reserve falls below the desired level. This financing mechanism delays payment to the contractor to a later date, and may require the contractor to borrow money to maintain the project schedule. The deferred certificates will have an 8-year term and a 7.5 percent

interest rate, the estimated cost of private, taxable financing. The certificates will have a capitalized interest rate for the first three years, and will be paid from revenues generated from the system after payment of debt service on senior gas/sales tax bonds, subordinated gas/sales tax bonds, and project revenue certificates.

Recapitulated below are key assumptions that are part of the financial model.

5.4.1 Key Cost Assumptions

- The capital cost stream is in 1996 dollars and is derived from the project implementation schedule.
- Capital costs are inflated at 4 percent per annum to identify costs in current dollars per year.
- Operating costs will begin in FY 2005/06 and are also inflated at 4 percent per annum to identify costs in current dollars per year.

5.4.2 Key Revenue Assumptions

- Revenue service begins in FY 2005/06.
- Ridership is based on the year 2015 and year 2020 ridership forecasts, with linear interpolation between the forecasts and assumptions regarding “ramp-up” at the start of operations.
- Passenger revenues begin at 85 percent of the full forecast level in 2005/06, ramping up to 95 percent in 2006/07, and reaching the full 100 percent level in FY 2008.
- Freight revenues begin at 50 percent of the full forecast level in FY 2005/06. The full 100 percent of freight revenue is realized from FY 2006/07 on.
- Revenue streams are projected from FY 2005/06 to FY 2011/12.
- Revenue streams to the project are inflated at 4 percent per annum, with the exception of gas tax receipts, which are inflated at 2.5 percent per year.
- The model requires a minimum cash balance of \$500,000 in any given year.

5.4.3 Key Debt Assumptions

- The senior³ debt interest rate is 5.95 percent.
- The subordinate⁴ debt interest rate is 6.45 percent.
- The project revenue certificate⁵ interest rate is 7 percent.
- Both the senior and subordinate debt terms are 30 years.
- A senior debt service coverage ratio of 1.3x was assumed in order to determine the amount of debt service a gas tax revenue backed bond could provide.

■ 5.5 The Financing Plan

Using the financial model described above together with the analysis of funding options, four separate financing plans were developed to test various combinations of base funding sources and system technology for the basic and extended high-speed rail system.

Ridership and revenue forecasts, capital cost estimates, and operating cost estimates used in the financing plans assume the SR-99 Base alignment option (Union Station to downtown San Francisco via the Grapevine Pass over the Tehachapis, new-alignment through the Central Valley, and over the Altamont Pass, into the Bay Area). The scenarios with extensions to Sacramento and San Diego assume the Stockton Corridor and LOSSAN routes. The ridership and revenue forecasts are consistent with the baseline forecasts presented in Chapter 4.0 of this report.

One of the more significant differences among the scenarios is that the scenarios with extensions take advantage of project revenue certificates while the scenarios without extensions do not. Figure 5.3 compares sources of capital project costs for the VHS system with and without extensions, assuming a gas tax funding source (the percentage breakdown would be similar for a sales tax base funding source).

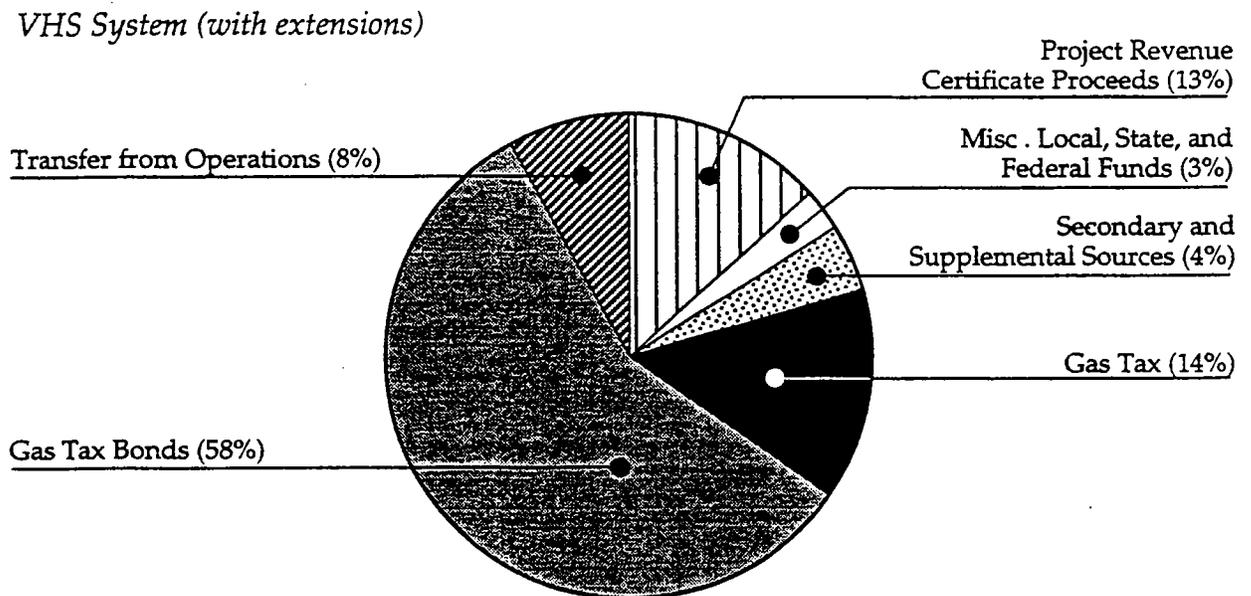
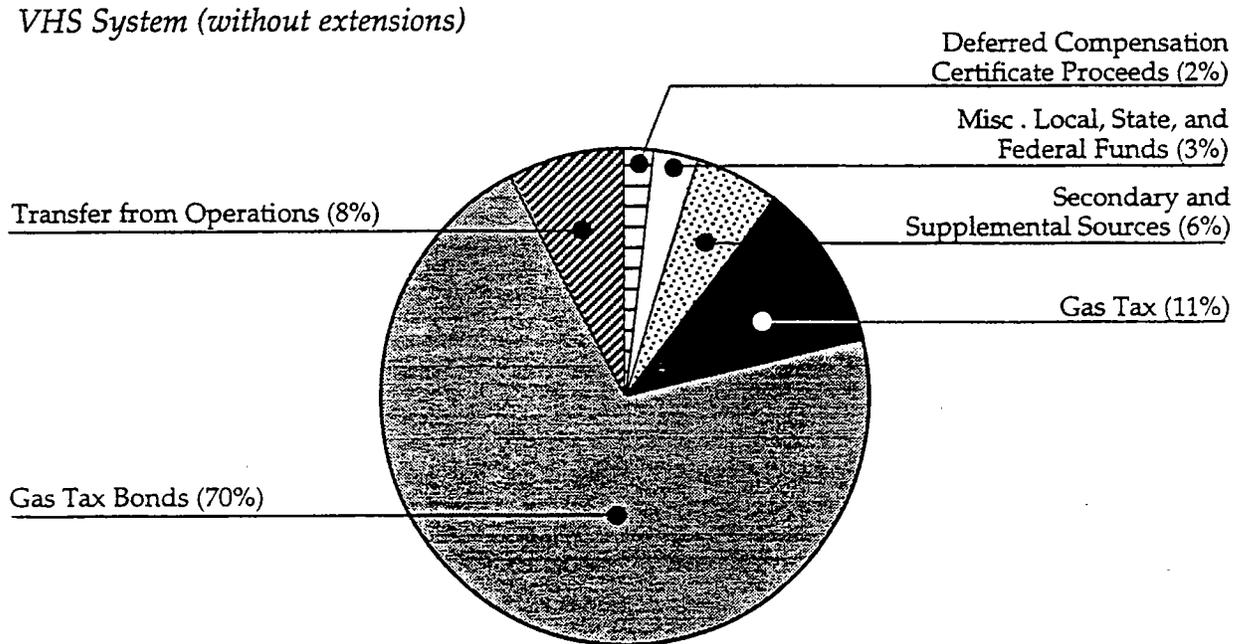
As shown, proceeds from the base funding source account for over 70 percent of project costs for the system without extensions. Transfers from operations supply 8 percent of the project costs and gas tax revenue supplies about 11 percent. Secondary sources including right-of-way donations, lease proceeds, interest earnings, and concession revenues account for about 6 percent of costs. Miscellaneous local, state, and federal government funding accounts for 3 percent, and deferred compensation certificate proceeds account for about 2 percent. When the extensions are added, the proportion of

³Senior debt is first in line to be repaid.

⁴Subordinate debt is paid off after senior debt is paid.

⁵Project Revenue Certificates are paid off next, and only with operating revenues.

**Figure 5.3 Source of Funds for Capital Project Costs
(Gas Tax Scenario)**



project costs covered by gas tax bond revenues drops to less than 60 percent, and deferred compensation certificates are not used. Instead, project revenue certificate proceeds account for some 13 percent of the capital costs.

Additional highlights of the financing plans are presented below with costs and revenues given in current (1996) dollars.

5.5.1 Gas Tax Scenario, Basic System

VHS Technology

For a VHS system, a 5 cent gas tax serves as the base funding source. The capital cost for the system is estimated at \$11.9 billion with an annual operating cost of \$238 million after the start-up period. Passenger revenue starts accruing in FY 2005/06 at \$274 million, reaching \$370 million by 2015. The system earns \$20.5 million in annual freight revenue and \$2.4 million from station concessions. The total bonded indebtedness of the project is \$8.1 billion in senior debt, \$1.2 billion in subordinate debt and \$282.4 million in deferred compensation certificates. Excess revenue is used to fund capital projects during the system's construction period and to retire debt.

Maglev Technology

The financing plan for the basic Maglev system would be structured similarly to that for the VHS system. In this case, however, a 6 cents per gallon gas tax would be required to support the debt.

5.5.2 Gas Tax Scenario, Extended System

VHS Technology

With extensions to San Diego and Sacramento, the estimated capital costs for the VHS system total \$18.2 billion. Annual operating costs are \$315 million, after the start-up period for service on the extensions. With the extensions, passenger revenue rises to \$333 million in FY 2007/08, rising to \$690 million by 2015. A 6 cent gas tax is necessary to fund the project, and total bonded indebtedness is \$14.5 billion, \$3.2 billion of which is from project revenue certificates.

Maglev Technology

If Maglev technology is selected, the additional gas tax required would rise to 6 cents per gallon for the basic system. With the extensions, the additional gas tax would be 8 cents per gallon to avoid deferrals of capital projects.

5.5.3 Sales Tax Scenario, Extended System

VHS Technology

Under this scenario, a 1/4 cent statewide sales tax would take the place of a gas tax as the base funding source. The total bonded indebtedness of the project is \$9.4 billion in senior debt, \$1.3 billion in subordinate debt, and \$5.5 billion in project revenue certificates. Because the sales tax generates less revenue to bond against, this scenario relies on the more costly project revenue certificates to a greater extent than the gas tax scenario does.

Maglev Technology

The sales tax financing plan for the extended Maglev system would be structured similarly to that for the VHS system. In this case, however, a 3/8 cent sales tax would be required to support the plan. The total bonded indebtedness of the project is \$14.2 billion in senior debt, \$1.8 billion in subordinate debt, and \$5.6 billion in project revenue certificates.

■ 5.6 Conclusions

Application of the financial model indicates that high-speed rail is financially feasible, under the stated assumptions, including voter approval of bonding authority for the high-speed rail project. The preliminary financing plans prepared assume that the system would be financed primarily by public funds with project design, construction and operation contracted to the private sector. This assumption regarding the structure of the public-private partnership is discussed further in the chapter on institutional issues.

The system analyzed⁶ may be financed with either a statewide sales tax (a 1/4 cent increase for a VHS system or a 3/8 cent increase for a Maglev system) or a statewide gas tax (5 cents for the basic VHS system, 6 cents for the extended VHS or basic Maglev system, or 8 cents for the extended Maglev system). Preliminary analysis indicates that a 1/2 cent sales tax imposed in the high-speed rail corridor counties, or a 4.8 percent increase to the sales tax on gasoline, would also be viable base funding options for at least the basic VHS system. If higher cost alignments are selected for the system, base funding requirements could change, or other funding contributions would have to increase.

Every effort should be made to maximize the contributions of secondary and supplemental sources in the final project financing plan. These sources include contributions from local governments within the rail corridor, contributions from private parking and concession developers, and the tax benefit transfer of depreciation rights for the rolling stock. The financing plans include assumptions about dedication of the portions of the right-of-

⁶The system analyzed is the SR-99 Base Alignment using the LOSSAN Corridor to San Diego.

way which are currently in public ownership, and make modest assumptions regarding state and federal funding in the early project development period.

The final selection of potential base funding options should be based on updated growth projections and conditions at the time of project financing. This decision should also take into account the ultimate project schedule and length of the construction period expected, as well as policy determinations related to tax equity.

6.0 Jurisdictional and Institutional Issues

6.0 Jurisdictional and Institutional Issues

■ 6.1 Introduction

The successful implementation of the high-speed rail system will require resolution of many complex jurisdictional and institutional issues and interagency relationships. As California's largest single transportation infrastructure project of statewide dimension, the project will face a potential maze of legal requirements and governmental regulations and reviews by federal, state, and regional agencies, as well as being subject to the policies of the numerous local jurisdictions along the Corridor. While designation of an appropriate institutional mechanism is needed to guide the project through this process, the high-speed rail project must still comply with existing laws and regulations and in as expeditious a manner as possible. At the same time, the project must provide a satisfactory process for assuring and responding to local input, to generate necessary political and financial support from the local jurisdictions.

Implementation of a project with such complexity has many inherent risks for both the public and the private sectors. Costs estimated could exceed projections for either or both construction and system operation. Pre-construction activities will be monumental, including acquisition of hundreds of miles of right-of-way through rural, suburban, and urban areas. Environmental reviews and clearances could take years, with large up-front costs. During the development period, the project may also remain at risk of a change in commitment from the Legislature, due to changed economic or political conditions.

In addition, while ridership forecasts indicate a significant ridership base with farebox revenues projected to exceed operating costs, such revenues will not be sufficient to pay principal and interest on the debt issued to construct the system. Thus, public financing in the form of bonds secured by a dedicated funding source will be necessary to finance system construction. Nevertheless, the private sector will be heavily involved in the high-speed rail system and will be asked to share responsibilities and risks.

To address these concerns, this chapter focuses on three key issues:

1. What jurisdictional roles and responsibilities should reside with each level of government (local, regional, state, and federal) in financing, development, construction, and operation, and in managing the environmental and regulatory compliance process?
2. What form of government agency or authority is most appropriate to undertake development, given the myriad agencies and public and private parties likely to be affected and/or involved? What is the range of powers that should be delegated to such an agency or authority?

3. What type of relationship should the State endeavor to form between the public and private sectors that is best suited to the goal of implementing high-speed rail service in California?

■ 6.2 Jurisdictional Analysis

There are over 36 federal, state and regional agencies and dozens of local governments that may have some measure of regulatory authority over development, construction or operational aspects of the high-speed rail system. Jurisdictional areas in which these entities could be involved include eight key functions: 1) land use planning and approvals; 2) design; 3) procurement; 4) funding; 5) environmental documentation; 6) construction; 7) operations; and 8) safety. Determining the requirements of all such agencies and developing the necessary compliance process and procedures will be one of the most significant hurdles to the successful development of the high-speed rail system.

Described below are some of the key functions in which each level of government is presently and likely to continue to be involved.

6.2.1 Role of the Federal Government

A number of federal agencies could potentially be involved in the high-speed rail system. The various agencies within the U.S. Department of Transportation (DOT) include the Federal Railroad Administration, the Federal Highway Administration, the Federal Aviation Administration, and the Federal Transit Administration. In addition, non-DOT agencies include U.S. Environmental Policy Agency; U.S. Department of the Interior, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, U.S. Forest Service, U.S. Soil Conservation Service, Native American Heritage Commission, Federal Communications Commission; and Federal Occupational Safety and Health Administration, and Amtrak.

Although no significant federal funding of the high-speed rail system is anticipated, some limited federal financial participation is likely to be pursued. How the federal government will manage its participation in high-speed rail projects has yet to be defined. In addition to potential financial support, the federal government will play a role in areas of safety rules and regulations, environmental issues, and operational requirements. If funding is provided, federal financing and procurement rules may also come into play. Potential permits for use of federal lands, transportation corridors, or waterways may also be required. In addition, Amtrak has the operating rights on the intercity routes it currently serves. Although Amtrak does not have to provide the service, it must grant permission to any alternative service provider. Thus, Amtrak's jurisdiction over the high-speed rail corridor needs to be clarified or alternative arrangements defined. Alternatively, Amtrak could be permitted to bid along with other parties for the right to operate the system.

6.22 Role of the State Government

The State of California will play the central role in the development of the high-speed rail system including funding, development, operations, and regulation. Among the state agencies likely to be involved are:

- Intercity High Speed Rail Commission (or its successor)
- California Transportation Commission
- California Debt Limit Allocation Committee
- Office of Planning and Research
- Department of Fish and Game
- Department of Parks and Recreation
- Office of the State Architect
- Department of Toxic Substance Control
- University of California
- Caltrans (California Department of Transportation)
- Public Utilities Commission
- State Resources Agency
- State Lands Commission
- Department of Conservation
- Department of Water Resources
- State Office of Historic Preservation
- Native American Heritage Commission
- State Water Resources Control Board

As discussed later in this chapter, designation and/or creation of an agency with overall responsibility for the high-speed rail system has not yet been considered fully, but options may include the California Department of Transportation (Caltrans), a newly created State authority, or some form of joint powers authority.

Authorizing legislation will need to outline the financing and procurement powers of the designated high-speed rail agency and any limitations on such powers. The existing regulatory jurisdiction of other state agencies will have to be considered in a variety of disciplines, including construction, operation, land use and environmental approvals, and safety oversight. The process selected by the State for expediting and coordinating regulatory reviews and approvals will be critical to project success. The approach to regulation of fares and charges, whether by contract with a private operator or by traditional rate regulation, must also be determined.

6.23 Role of Regional Agencies

Regional agencies in California have primary responsibility for environmental regulation with respect to air and water quality, as well as for regional transportation policies and funding.

Among the regional agencies who will likely be involved in the high-speed rail project are the regional transportation planning agencies and transportation commissions, multi-county designated transportation planning agencies, councils of government, airport land use commissions, regional air pollution control districts, regional water quality control boards, and special entities like the San Francisco Bay Conservation and Development Commission. The need to comply with differing and possibly conflicting policies and plans of such regional boards will present important policy issues.

6.24 Role of Local Governments

State agencies are generally exempt from local regulations with respect to zoning, building, and to some extent police power. The exemption of the high-speed rail system is less clear because the system may be built, operated, and/or owned with private involvement. Depending on the route chosen, some of the major cities with potential jurisdiction over the basic high-speed rail system would include Los Angeles, Glendale, Burbank, Bakersfield, Fresno, Modesto, San Jose, Fremont, and San Francisco, as well as additional major cities within the southern and northern extension areas. Among the counties with potential jurisdiction are Los Angeles, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, Contra Costa, Alameda, San Mateo, Santa Clara, San Benito, Fresno, and San Francisco; with the counties of Orange, San Diego, Solano, and Sacramento involved in the southern and northern extension areas.

Regardless of whether exemptions from local review and permitting processes are obtained, an extensive public involvement plan will be required to insure that full and fair consideration is given to local environmental, economic, and land use impacts. In addition, the high-speed rail system will be required to be coordinated with urban transit service in each urban area where such service is available.

6.25 Key Jurisdictional Roles and Responsibilities to be Addressed

The issues raised by the numerous agencies and their overlapping roles and responsibilities have been addressed in detail in legislation authorizing the Texas and Florida high-speed rail programs. Such authorizing legislation includes delegation of authority to an implementing agency, the method by which the State's implementing agency provides interagency coordination, and its authority to exempt the high-speed rail project franchisee from rules and regulations of other governmental bodies. Legislation authorizing the California high-speed rail system will similarly need to address such jurisdictional questions, including the following:

- **Funding** – To what extent should the regulatory authority of federal, state or local governments be based on funding? Authorizing legislation should grant the high-speed rail system broad procurement powers. To the extent local governments fund a portion of the cost of stations and terminals, their rights to determine procurement procedures should be considered.
- **Land Use Planning and Design** – Consideration should be given to granting the high-speed rail system exemptions from local regulations or giving the designated state high-speed rail authority the power to override local rules on a case-by-case basis. Nevertheless, procedures should be developed to assure that local concerns are addressed. The State sponsoring agency will need to coordinate and expedite reviews by separate state agencies and assist in resolving conflicts.
- **Environmental Documentation and Reports** – The process should be streamlined to help ensure the project keeps on schedule and within budget. The role and responsibilities of the State high-speed rail agency or authority in coordinating the review and comment by separate agencies should be outlined. Whether specialized regional agencies retain jurisdiction over the high-speed rail system or that power be transferred to a statewide agency should be considered.
- **Construction** – The permitting and approval role, including safety, of agencies whose jurisdiction arises solely because a portion of the high-speed rail system route crosses their jurisdiction should be addressed.
- **Operations** – The high-speed rail agency or authority should have the ability to determine what entity or party will be responsible for long-term operations and maintenance. Which state agency will retain operating oversight responsibilities and the extent of such authority for fare setting, safety or service will need to be determined.

■ 6.3 Form of Agency or Authority for High-Speed Rail Implementation

The entity selected or created for implementing the high-speed rail system in California must be endowed with a range of powers to accomplish its mandate. Outlined below are alternative types of government entities that could be authorized to undertake development of the California high-speed rail system. These include the existing State Department of Transportation (Caltrans), a joint powers authority, or a special authority. The characteristics and necessary scope of powers of these types of entities are described below:

State Department of Transportation – California could follow the model established by Florida to implement high-speed rail service. Florida's current effort has been undertaken by that state's Department of Transportation under special authorizing legislation. The proposer recently selected for negotiations to design, build, and operate the system, however, has suggested that the project be owned and financed by a separate authority.

Although Caltrans has experienced staff, ample resources, and is part of the Executive Branch, a direct undertaking of the high-speed rail system by the department may subject the project to state procurement rules and other restrictive laws and regulations, unless the high-speed rail system is expressly exempted. Segregation of funds and accounts may be required for any revenue-type financing.

Joint Powers Authority – The State of California could follow the model represented by the Orange County Transportation Corridor Agencies (TCA). Charged with implementing three new toll highways within Orange County, TCA members include representatives from local governments within the corridors, and from Caltrans. Membership in a newly created Joint Powers Authority for high-speed rail could include the counties and various local governments within the Corridor.

Since joint powers agencies only have powers of their members, additional powers would need to be granted by statute. Given the size of the high-speed rail corridor, a large number of members could prove unwieldy.

Special Authority – An independent authority, such as that created in Texas, may be the most workable type of governing entity to undertake a project of the size and scope of the high-speed rail system. Appointment of members by the Governor, the Legislature, and/or Corridor Councils of Governments could assure responsiveness without the excessive politicization that may result from an elected board. The most effective boards generally have a membership not in excess of 15 persons.

Whatever its composition, the Authority must be able to gain local support and involvement if it is to succeed in obtaining local financing for stations and other facilities. In addition, the Authority must obtain the cooperation of local government with respect to permitting, mitigations, environmental review, design and construction.

6.3.1 Powers of the High-Speed Rail Agency or Authority

The high-speed rail agency or authority will require a broad range of powers relating to such matters as final route determination, establishing criteria for award of contracts and/or concessions, flexibility in structuring agreements with the private sector, and ability to coordinate and expedite the permitting process. The legislation designating and/or creating the responsible agency or authority should expressly grant to it the power to do the following:

- Hire staff;
- Establish criteria for award of franchises and contracts;
- Conduct feasibility studies;
- Issue RFPs; negotiate with proposers; award contracts to franchisees, contractors and consultants;

- Enter into a range of contractual arrangements from design-build, design-build-operate and concession (exemption from certain procurement rules may be needed and the agency or authority should be specifically authorized to agree to provisions necessary for financing purposes);
- Determine corridors; select or approve routes and station and terminal sites;
- Conduct hearings; coordinate input from other agencies and local bodies;
- Function as a "one-stop" permitting authority; consider power to exempt from other agency or local government requirements;
- Accept grants from local, state or federal government. enter into cooperation or joint development agreements with local governments; enter into cost-sharing and other innovative financing agreements with the private sector;
- Issue debt secured by pledges of State funds, federal grants or project revenues;
- Acquire right-of-way by purchase or eminent domain;
- Engage in joint development of real estate;
- Relocate highways and utilities;
- Regulate advertising or other uses on land adjacent to right-of-way;
- Set fares or regulate or negotiate rate of return on investment (limitation can be set by contract in lieu of utility-type regulation);
- Adopt and enforce administrative regulations; and
- Sue and be sued.

■ 6.4 Public-Private Sector Relationship

Project delivery mechanisms refer to the type of relationship the State should endeavor to form between the public and private sectors that is best suited to meeting the goal of implementing high-speed rail in California. Table 6.1 provides some examples of the various configurations the public-private relationship can take.

In the sections below, a continuum of project delivery mechanisms are outlined, ranging from traditional public agency development, funding and operation at one end of the spectrum, to private design, construction and operation with no public subsidy at the other. Intermediate options include varying roles for the public and private participants in project definition, work responsibility, risk allocation and funding. For discussion purposes, the continuum has been compressed into three major categories:

Table 6.1 Examples of Public Private Partnerships

Projects	Construction	Operation	Ownership	Financing	Control Over Revenues
California State Highway System	○	○	○	○	○
BART and LACMTA light and heavy rail systems	○	○	○	○	○
Orange County Transportation Corridor Agencies	●	●	●	●	⊙
New Jersey Transit Hudson-Bergen Light Rail Line	●	●	●	⊙	⊙
Florida High Speed Rail Project	●	●	●	●	⊙
Dulles Greenway Tollroad	●	●	●	●	●
SR 91 HOV Lanes	●	●	●	●	●
Eurotunnel	●	●	●	●	●

○ = Public
 ● = Private
 ⊙ = Public-private

- Traditional Public Works Procurement;
- Design-Build or Design-Build-Operate Contracting Financed Primarily with Public Funds; and
- Private Concession to Design-Build-Operate with Substantial, Limited, or No Government Financial Commitment.

6.4.1 Traditional Public Works Procurement

Roles of the Public and Private Sectors

This option is the traditional model for public works project development, funding, and operation in the United States. Under this approach, the Government has primary responsibility for planning, construction, financing and operation. Private companies provide separate consulting, engineering and construction services on a pay-as-you-go basis.

Construction and supply contracts are awarded to the lowest responsible bidder, based on the public agency's preliminary design and engineering. The contractor can obtain price increases under change orders in the event of design changes or design defects, differing site conditions, changes in law, and force major events. The public sector provides all financing from: 1) general fund appropriations; 2) dedicated tax revenues; 3) general obligation or special tax revenue bonds; and/or 4) federal grants. Examples of this approach include the California State Highway System, Bay Area Rapid Transit (BART), and the Los Angeles Metro Rail system.

Suitability Criteria

The following characteristics typify conditions under which traditional public works procurement is most suitable:

- The public agency is well-staffed and experienced in managing projects of comparable size and complexity;
- The project is characterized by low technology risk, manageable construction risks, and minimal time constraints; and
- Ample sources of public funding are available, without dependency on the existence or level of user fees.

6.4.2 Design-Build or Design-Build-Operate Contracting Financed Primarily with Public Funds

Roles of the Public and Private Sectors

This option groups a range of approaches under which project design, construction, and sometimes operation are contracted out to the private sector. Typically, the government issues a Request for Proposals (RFP) based on already-completed preliminary design. The private contractor or consortium of private contractors furnish final design and construct the project in accordance with established performance criteria instead of detailed design specifications. A variant of this includes the addition of operating responsibilities to the contractor's scope.

Among the variations in this approach are the following:

- Traditional public works procurement, modified to employ design-build contracts for one or more key project elements or segments, for which a private company provides final design bundled together in one contract with either construction or equipment supply and installation;
- Design-build contracting for an entire project with public funding and operation;
- Design-build contracting for an entire project with public operation and primarily public funding, but with the contractor providing limited cash-flow financing in the form of development cost advances, interim cash-flow financing or subordinated debt;
- Design-build-operate contracting for an entire project with public funding, under which the contractor provides long-term operation and maintenance services with the government sponsor retaining the operating revenue risk;
- Design-build-operate contracting with primarily public funding, but with the contractor providing limited cash-flow financing in the form of development advances, interim cash-flow financing or subordinated debt; or
- Design-build-operate contracting with private financing secured by the government agency's obligation to make scheduled payments under the contract.

Under the Design-Build or Design-Build-Operate approaches, contract award is based on price and other factors including: the contractor's track record, technical expertise, contract management skills; financial strength; suitability and cost-effectiveness of the proposed design; completion date and operating cost guarantees; and the assumption of risks by the contractor.

The contractor is paid with government funds, with the public agency retaining ownership and control over project revenues.

Examples of this approach include the Orange County Transportation Corridor Agencies and the New Jersey Transit Hudson-Bergen Light Rail Line.

6.4.3 Suitability Criteria

The criteria under which Design-Build and Design-Build-Operate may be appropriate are:

- Time and fiscal constraints result in the need for price and completion date guarantees;
- Advanced technology requires broad and long-term performance warranties;
- The public agency has authority to engage in competitive negotiation, and to make award based on price “and other factors,” and the public agency is not restricted from “contracting-out” operations; or
- Full funding for the project has been secured in advance of the contract award.

6.4.4 Private Concession to Design-Build-Operate with Substantial, Limited or No Government Financial Commitment

Roles of Public and Private Sectors

Under this approach, the public agency grants a franchise to a private consortium to build, own (or lease) and operate the project for a fixed term. The contractor determines rates to be charged for facility usage (in the form of tolls, fares, access fees, etc.) and has right to receive all or a portion of net revenues, subject to a cap on return on investment.

The contractor has primary responsibility for obtaining right-of-way, environmental clearances, community acceptance and all necessary government approvals and permits. The contractor is also responsible for project financing (which may still be done on a tax-exempt basis), secured by operating revenues. The government may support the project with limited or substantial contributions toward permitting costs, site acquisition or debt service.

Among the variations in this approach are the following:

- A private concession is awarded to design, build and operate the project, with the design-build-operator receiving an interest in the operating profits of the enterprise, and the government providing limited financial assistance, taking such forms as development period cost-sharing or limited revenue guarantees; or
- A private concession is awarded to design, build and operate the project with no public subsidy or other government financial commitment.

Examples of this approach include the Dulles Greenway Toll Road, (California) State Route 91 Toll Road, and Eurotunnel, all of which received no government funding, and the Florida high-speed rail project, for which substantial government funding is proposed.

Suitability Criteria

Criteria under which award of a private concession may be appropriate include:

- Project revenues are sufficient to cover operating costs and debt service, while providing a return to equity investors;
- Development period risks are minimal or shared with the government; and
- Strong and reliable traffic or use projections are available, with competition from other facilities limited.

■ 6.5 Suitability of Public-Private Project Delivery Options to the California High-Speed Rail System

The relative suitability of the various public-private project delivery options should be evaluated in light of the economic, financial, ridership, legal and other factors that are likely to apply to the California high-speed rail system. Key factors include the following:

- The estimated project cost of the basic Los Angeles to San Francisco system ranges from \$11.1-21.4 billion, depending on alignment and technology. Costs for an extension to San Diego range from \$4.5 to 7.9 billion. The Sacramento extension is estimated to cost between \$1.7 and 3.5 billion.
- Projected revenues from system operation for both the basic Los Angeles-San Francisco system and the system with extensions will be sufficient to cover operating expenses. For example, annual revenues for the basic VHS system using the SR-99 Base alignment would total \$377 million in 2012 while operating expenses are projected to be \$238 million.
- Cash flow net of operating expenses for the Los Angeles to San Francisco route would support debt service only on \$500 million to \$750 million of construction debt. Thus, significant public funds will be required to support the remaining debt service.
- The pre-construction period will be lengthy and the environmental and permitting processes will be costly and challenging. Accordingly, pre-construction risks will be high.
- High-speed rail involves advanced technology that can be provided by a limited number of vendors. The State government may lack sufficient experience and internal resources to build or operate the project on its own through the traditional project delivery method.
- Private sector participation in some portion of the financing through subordinated debt or other mechanisms is desirable.

- Allocating additional public funds or assigning net operating revenues will be necessary to finance future extensions.

■ 6.6 Public-Private Project Delivery Mechanism

The characteristics of the high-speed rail system described above suggest that the most appropriate types of partnership with the private sector are design-build, design-build operate, and concession arrangements in addition to traditional bid-build contracting. The financial structure will depend, of course, on final cost and revenue projections and availability of State funds.

Key factors supporting this finding include:

- There is no public agency with the experience and resources to construct a technologically advanced system without major private participation.
- Advanced and unique system technology requires shifting the technology risk to the private sector through long term performance and operations warranties.
- Design-build-operate contracting or concession with some private sector financing will incentivize on-time, on-budget construction and shift to the private party a large degree of financial risk from construction delay, once environmental clearances and permits are received.
- Because environmental hurdles are so extensive, it is unlikely a private contractor will be willing to put significant funds at risk during the development stage.
- The base funding analysis (and the failures of the Florida 1, Texas and California-Nevada projects) underscores the need for large public funding of capital requirements. Accordingly, a private concession without public subsidies does not appear feasible. If a concession is used, the contract must be carefully structured to protect the State from excessive construction costs, something not needed where the franchisee takes the financing risk.
- Excess revenues above debt service could be used to support additional private sub-debt or even equity, unless the State elects to use such funds to finance project extensions.
- A key public policy distinction between design-build and concession approaches concerns control over fare-setting and maximization of ridership. To the extent the private sector assumes any operating revenue risk under a concession arrangement, it will require a role in fare-setting, notwithstanding adverse effects on ridership.