

## Chapter 7

### ***Financial Analysis and Funding***

#### **Introduction**

This chapter presents the financial analysis and funding strategy for the California High-Speed Rail program. The initial part of this chapter focuses on operational viability and the ability of the various sections of the system to be operated without a subsidy. Included in this section is a detailed description of the project's breakeven point. This section is followed by a discussion of projected cash flows and capital funding plans for the various sections of the system including private-sector investment.

The planning case presented in the initial sections of this chapter is based on the development of the Phase 1 Blended system starting with the IOS, the Medium Ridership Scenario, and the year-of-expenditure (YOE) revenues and costs presented in earlier chapters. The final section of this chapter illustrates a set of alternative scenarios to demonstrate the impact of various types of changes to key planning assumptions. The analysis in this chapter is presented in terms of cash flow, which is consistent with the State's need to evaluate questions relating to operating subsidies and potential financing opportunities for investors.

This chapter includes several key findings. The analysis of potential operating sections shows that the system can be operationally self-sustaining and would not require operating subsidies. As illustrated in this chapter, the system is projected to generate a positive net cash flow from operations. The breakeven analysis illustrates that ridership projections could be below the low projection and the project could still reach breakeven on an operating cash flow basis.

Cash-flow projections illustrate that the project does not have an internal rate of return sufficient to finance the total capital required for construction, which supports the need for up-front government investment. Absent cost of capital and financing, the cash flows illustrate a cash on cash payback of 45 years (i.e., if the system were built and operated by one entity that paid for all costs and collected all revenue, the amount spent would equal the amount collected in 45 years). This illustrates that the project is not financeable early, but that capital costs are eventually recouped without regard to financing. The process for this analysis was confirmed by external review by the Bay Area Council Economic Institute.

Full funding for the IOS is identified. The first construction segment of the IOS will be funded with a mix of Proposition 1A funds and federal funds totaling \$6 billion. The remaining portions of the IOS will be funded using state bonds, federal support, and local funds, and cap and trade funds are available as needed, upon appropriation, as a backstop against federal and local support to complete the IOS. The Bay to Basin system is expected to be funded using a mix of federal, local, and other funds, as well as private-sector capital. Phase 1 Blended is expected to be funded in a similar manner.

The remainder of this chapter discusses the following:

- Operational viability
- Project breakeven
- Project cash flows
- Capital funding
- Private-sector investment
- Alternative funding scenarios

## Operational viability

This section discusses the amount of projected revenues, operating and maintenance expenses, and net cash flow from operations that are estimated for the system over time. For purposes of this Revised 2012 Business Plan (Revised Plan), net cash flow from operations is defined as project revenues less operating and maintenance expenses.

Revenue and operating and maintenance cost scenarios are described in Chapter 5, Ridership and Revenue, and Chapter 6, Operating and Maintenance Costs. Exhibit 7-1, Exhibit 7-2, and Exhibit 7-3 illustrate the first 12 years of projected revenue and operating and maintenance (O&M) costs in YOE or inflated dollars. The first 12 years encompass the opening and ramp-up of the system beginning with the IOS, projected to open in 2022; Bay to Basin, open in 2027; and Phase 1 Blended, open in 2029. Projections are shown for the High, Medium, and Low Ridership Scenarios, respectively. As described in Chapter 5, revenue projections include ancillary revenue which constitutes 1 percent of revenue. Exhibit 7-4 shows the growth in net cash flow from operations through 2060. Full cash flow projections through 2060 for each scenario are provided in the attachments to this Revised Plan.

**Exhibit 7-1. Net cash flow from operations (YOE dollars in millions)—High Scenario**

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Revenue	\$486	\$675	\$878	\$1,096	\$1,329	\$1,915	\$2,174	\$2,649	\$3,019	\$3,345	\$3,605	\$3,879	\$4,016
Less: O&M costs	\$(334)	\$(354)	\$(527)	\$(556)	\$(591)	\$(875)	\$(976)	\$(1,133)	\$(1,216)	\$(1,334)	\$(1,419)	\$(1,564)	\$(1,624)
<b>Net cash flow from operations</b>	<b>\$151</b>	<b>\$321</b>	<b>\$351</b>	<b>\$540</b>	<b>\$738</b>	<b>\$1,040</b>	<b>\$1,198</b>	<b>\$1,516</b>	<b>\$1,804</b>	<b>\$2,010</b>	<b>\$2,186</b>	<b>\$2,316</b>	<b>\$2,391</b>

**Exhibit 7-2. Net cash flow from operations (YOE dollars in millions)—Medium (Planning Case) Scenario**

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Revenue	\$380	\$524	\$678	\$844	\$1,020	\$1,492	\$1,698	\$2,089	\$2,392	\$2,659	\$2,875	\$3,102	\$3,211
Less: O&M costs	\$(321)	\$(345)	\$(382)	\$(499)	\$(547)	\$(755)	\$(814)	\$(945)	\$(1,075)	\$(1,133)	\$(1,252)	\$(1,328)	\$(1,381)
<b>Net cash flow from operations</b>	<b>\$59</b>	<b>\$179</b>	<b>\$296</b>	<b>\$345</b>	<b>\$473</b>	<b>\$737</b>	<b>\$884</b>	<b>\$1,144</b>	<b>\$1,316</b>	<b>\$1,526</b>	<b>\$1,623</b>	<b>\$1,775</b>	<b>\$1,830</b>

**Exhibit 7-3. Net cash flow from operations (YOE dollars in millions)—Low Scenario**

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Revenue	\$274	\$373	\$478	\$591	\$711	\$1,069	\$1,222	\$1,530	\$1,765	\$1,973	\$2,144	\$2,325	\$2,407
Less: O&M costs	\$(239)	\$(322)	\$(354)	\$(376)	\$(386)	\$(646)	\$(734)	\$(830)	\$(889)	\$(951)	\$(1,072)	\$(1,116)	\$(1,163)
<b>Net cash flow from operations</b>	<b>\$35</b>	<b>\$51</b>	<b>\$124</b>	<b>\$215</b>	<b>\$325</b>	<b>\$423</b>	<b>\$487</b>	<b>\$700</b>	<b>\$875</b>	<b>\$1,022</b>	<b>\$1,073</b>	<b>\$1,210</b>	<b>\$1,244</b>

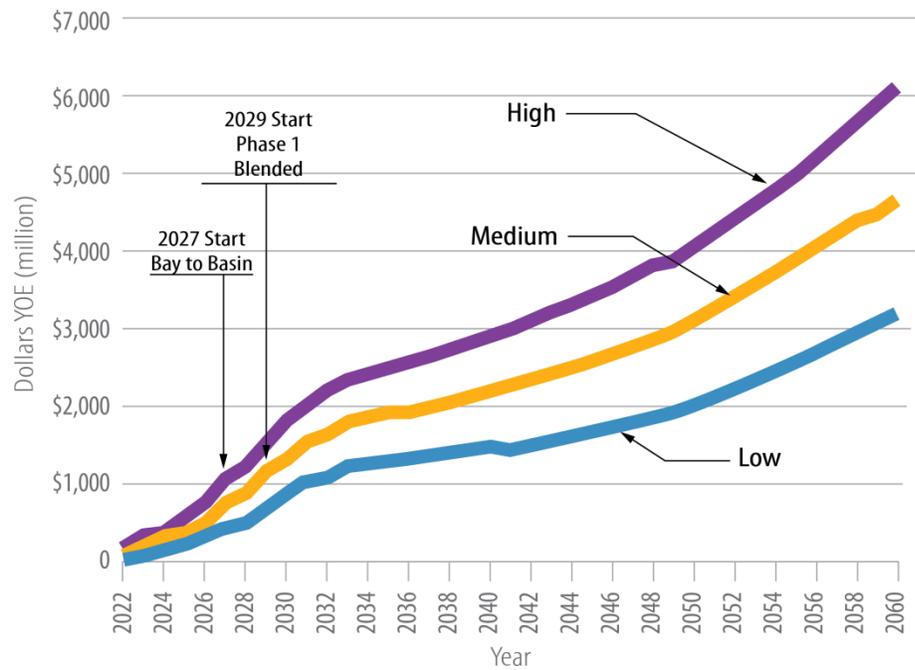
The projections illustrate that under all three revenue and operating and maintenance cost scenarios, the project generates positive net cash flow from operations beginning with the initial year of operations. In 2026, the net cash flow from operations for the Medium and Low Ridership Scenarios are lower than the High Ridership Scenario by 36 percent and 56 percent, respectively. Each operating segment of the project is subjected to a five-year ramp-up period.

Projections illustrate that the three revenue and operating and maintenance cost scenarios generate positive net cash flow operations.

Based on the Medium Scenario, net cash flow from operations in year 2022 is projected to be \$59 million. Net operating cash flow from operations rises to \$1.8 billion after full ramp up of the Phase 1 Blended operations in 2034.

Exhibit 7-4 illustrates the net cash flow from operations for each ridership scenario from 2022 to 2060 in YOE dollars assuming the Phase 1 Blended development approach. Exhibit 7-4 demonstrates growth in net cash flow from operations in all ridership scenarios from the commencement of operations in 2022 to the analysis period end in 2060.

**Exhibit 7-4. Net cash flow from operations—Phase 1 Blended (YOE dollars in millions)**



**Breakeven analysis**

Exhibit 7-5 presents the results of the breakeven analysis that was performed using the revenues for the High, Medium, and Low Ridership Scenarios. The analysis identifies the revenue necessary to equal the minimum operating and maintenance costs needed to run the system. The results are presented for 2022, which is the first year of IOS operations and the year most sensitive to changes in ridership. The results also are presented for 2026, which is 5 years into the operations period and after the IOS ramp-up period.

Exhibit 7-5 shows that projected ridership for the High Ridership Scenario in the first year of operations (2022) could fall 55 percent and still cover operating and maintenance costs. As the project progresses through operations, the percentage increases. In 2026, the breakeven percentage is 81 percent below the high ridership projection. The number of riders needed to breakeven when the IOS opens in 2022 is 2.35 million or 45 percent of the high projection. The number of riders needed to breakeven when the Phase 1 Blended is opened in 2029 is 6.1 million or 23 percent of the high projection.

**Exhibit 7-5. Revenue breakeven analysis**

Ridership Scenario	IOS Startup in 2022		IOS in 2026		Phase 1 Blended Startup in 2029	
	2022 Revenue (YOE dollars in millions)	Percent of 2022 High Ridership Revenue	2026 Revenue (YOE dollars in millions)	Percent of 2026 High Ridership Revenue	2029 Revenue (YOE dollars in millions)	Percent of 2029 High Ridership Revenue
High	\$486	100%	\$1,329	100%	\$2,649	100%
Medium	\$380	78%	\$1,020	77%	\$2,089	79%
Low	\$274	56%	\$711	54%	\$1,530	58%
Breakeven	\$218	45%	\$247	19%	\$601	23%

As illustrated in Exhibit 7-6, projections indicate that no operating subsidy will be required under High, Medium, or Low Ridership Scenarios. This is consistent with the results of other high-speed rail projects across the world.

**Exhibit 7-6. 2022 net cash flow from operations summary (YOE dollars)**

Year 2022	Revenue	Operating Cost	Net Cash Flow from Operations	Operating Subsidy?
High	\$486	(\$334)	\$151	No
Medium	\$380	(\$321)	\$59	No
Low	\$274	(\$239)	\$35	No

**Project cash flow analysis**

This section provides a project cash flow analysis through 2060. The net project cash flow calculation begins with the net cash flow from operations (revenue less operations and maintenance costs) discussed above. Depreciation is a non-cash item and is excluded from this calculation. To account for capital replacement needs, the projected annual expenditures for repairing and replacing capital assets over time, including trains, equipment, and rail infrastructure, are then deducted to arrive at net operating cash flow after capital replacement costs. This represents the net cash flow available to be used for capital purposes and is before consideration of any debt service or investment returns.

The net cash flows are used to calculate an internal rate of return and capital payback period for the project before any consideration of financing or any particular source of funding. This analysis does not differentiate between funds that must be repaid (e.g., a Transportation Infrastructure Finance and Innovation Act of 1998 loan) and funds that do not (e.g., an American Recovery and Reinvestment Act of 2009 (ARRA) grant). This analysis provides an understanding of how total revenues, operating and maintenance costs, capital replacement, and construction costs interact together without regard to sources.

As illustrated in Exhibit 7-7 net cash flow from operations and after payment of capital replacement costs through 2060 exceeds \$83 billion. The project requires capital of \$68.4 billion until 2029 when Phase 1 Blended is complete.

The net project cash flows have been analyzed over the entire analysis period (2013 to 2060) to calculate the project internal rate of return (IRR). The estimated IRR for the project is 0.78 percent, which is low because capital costs must be paid up front while revenues come in over an extended period into the future. This total project return is insufficient to attract capital to pay for the entire project.

While the IRR is low, the project does pay back its capital over time. The payback period for the total capital invested is 36 years from IOS operations commencement and 45 years from start of construction. It is estimated that net cash collected will equal total cash expended for capital in 2057.

The analysis above is instructive for evaluating why the project cannot be totally self-financing. As grants and other government funding sources that do not require repayment from the project are contributed to the project, the payback period shortens and the IRR increases. The analysis of the relative contribution of public-sector funding and private-sector financing is provided in the next section.

The approach and results of the net project cash flow analysis were independently reviewed and verified by the Bay Area Council Economic Institute, which confirmed that the cash flows were accurately calculated and that the analysis approach is consistent with that used in the financial industry to calculate project payback period and internal rates of return.

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**“We found the cash flow projection to be accurately calculated using a traditional cash flow analysis framework used by the financial industry to determine payback periods and internal rates of return.”**

*Bay Area Council Economic Institute, March 20, 2011*

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Exhibit 7-7. Net project cash flow through Phase 1 Blended (YOE dollars in millions) Medium Case

	Total Cash Flow through 2060	2013	2014	2015	2016	2017	2018	2019	2020	2021
Revenue	\$160,585	—	—	—	—	—	—	—	—	—
Less: O&M	(\$70,643)	—	—	—	—	—	—	—	—	—
<b>Net cash flow from operations</b>	<b>\$89,942</b>	—	—	—	—	—	—	—	—	—
Capital replacement costs	\$(6,609)	—	—	—	—	—	—	—	—	—
<b>Net operating cash flow after capital replacement</b>	<b>\$83,333</b>	—	—	—	—	—	—	—	—	—
Capital cost	\$(68,365)	\$(1,334)	\$(1,289)	\$(4,101)	\$(4,224)	\$(4,351)	\$(4,741)	\$(4,884)	\$(5,030)	\$(5,385)
<b>Net project cash flow</b>	<b>\$14,968</b>	<b>\$(1,334)</b>	<b>\$(1,289)</b>	<b>\$(4,101)</b>	<b>\$(4,224)</b>	<b>\$(4,351)</b>	<b>\$(4,741)</b>	<b>\$(4,884)</b>	<b>\$(5,030)</b>	<b>\$(5,385)</b>
<b>Cumulative net project cash flow</b>		<b>\$(1,334)</b>	<b>\$(2,623)</b>	<b>\$(6,724)</b>	<b>\$(10,948)</b>	<b>\$(15,299)</b>	<b>\$(20,040)</b>	<b>\$(24,924)</b>	<b>\$(29,954)</b>	<b>\$(35,339)</b>
<b>Project IRR</b>	<b>0.78%</b>									

Exhibit 7-7. Net project cash flow through Phase 1 Blended (YOE dollars in millions) Medium Case (continued)

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Revenue	\$380	\$524	\$678	\$844	\$1,020	\$1,492	\$1,698	\$2,089	\$2,392	\$2,659
O&M	\$(321)	\$(345)	\$(382)	\$(499)	\$(547)	\$(755)	\$(814)	\$(945)	\$(1,075)	\$(1,133)
<b>Net cash flow from operations</b>	<b>\$59</b>	<b>\$179</b>	<b>\$296</b>	<b>\$345</b>	<b>\$473</b>	<b>\$737</b>	<b>\$884</b>	<b>\$1,144</b>	<b>\$1,316</b>	<b>\$1,526</b>
Capital replacement costs	\$0	\$(1)	\$(4)	\$(4)	\$(4)	\$(14)	\$(15)	\$(16)	\$(17)	\$(17)
<b>Net operating cash flow after capital replacement</b>	<b>\$59</b>	<b>\$178</b>	<b>\$292</b>	<b>\$341</b>	<b>\$469</b>	<b>\$723</b>	<b>\$869</b>	<b>\$1,128</b>	<b>\$1,300</b>	<b>\$1,509</b>
Capital cost	\$(4,805)	\$(6,315)	\$(6,505)	\$(6,700)	\$(3,685)	\$(2,471)	\$(2,545)	—	—	—
<b>Net project cash flow</b>	<b>\$(4,746)</b>	<b>\$(6,137)</b>	<b>\$(6,212)</b>	<b>\$(6,359)</b>	<b>\$(3,216)</b>	<b>\$(1,749)</b>	<b>\$(1,676)</b>	<b>\$1,128</b>	<b>\$1,300</b>	<b>\$1,509</b>
<b>Cumulative net project cash flow</b>	<b>\$(40,085)</b>	<b>\$(46,222)</b>	<b>\$(52,435)</b>	<b>\$(58,793)</b>	<b>\$(62,010)</b>	<b>\$(63,758)</b>	<b>\$(65,435)</b>	<b>\$(64,307)</b>	<b>\$(63,007)</b>	<b>\$(61,498)</b>

Exhibit 7-7. Net project cash flow through Phase 1 Blended (YOE dollars in millions) Medium Case (continued)

	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Revenue	\$2,875	\$3,102	\$3,211	\$3,324	\$3,441	\$3,562	\$3,687	\$3,817	\$3,951	\$4,090
O&M	\$(1,252)	\$(1,328)	\$(1,381)	\$(1,440)	\$(1,531)	\$(1,594)	\$(1,656)	\$(1,721)	\$(1,789)	\$(1,860)
<b>Net cash flow from operations</b>	<b>\$1,623</b>	<b>\$1,775</b>	<b>\$1,830</b>	<b>\$1,885</b>	<b>\$1,910</b>	<b>\$1,968</b>	<b>\$2,031</b>	<b>\$2,096</b>	<b>\$2,162</b>	<b>\$2,230</b>
Capital replacement costs	\$(24)	\$(24)	\$(25)	\$(27)	\$(23)	\$(24)	\$(24)	\$(27)	\$(22)	\$(23)
<b>Net operating cash flow after capital replacement</b>	<b>\$1,598</b>	<b>\$1,750</b>	<b>\$1,805</b>	<b>\$1,858</b>	<b>\$1,887</b>	<b>\$1,944</b>	<b>\$2,007</b>	<b>\$2,069</b>	<b>\$2,139</b>	<b>\$2,207</b>
Capital cost	—	—	—	—	—	—	—	—	—	—
<b>Net project cash flow</b>	<b>\$1,598</b>	<b>\$1,750</b>	<b>\$1,805</b>	<b>\$1,858</b>	<b>\$1,887</b>	<b>\$1,944</b>	<b>\$2,007</b>	<b>\$2,069</b>	<b>\$2,139</b>	<b>\$2,207</b>
<b>Cumulative net project cash flow</b>	<b>\$(59,900)</b>	<b>\$(58,149)</b>	<b>\$(56,345)</b>	<b>\$(54,487)</b>	<b>\$(52,599)</b>	<b>\$(50,655)</b>	<b>\$(48,648)</b>	<b>\$(46,579)</b>	<b>\$(44,440)</b>	<b>\$(42,234)</b>

Exhibit 7-7. Net project cash flow through Phase 1 Blended (YOE dollars in millions) Medium Case (continued)

	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051
Revenue	\$4,234	\$4,382	\$4,537	\$4,696	\$4,861	\$5,032	\$5,209	\$5,392	\$5,581	\$5,778
O&M	\$(1,931)	\$(2,001)	\$(2,073)	\$(2,143)	\$(2,229)	\$(2,302)	\$(2,371)	\$(2,435)	\$(2,492)	\$(2,546)
<b>Net cash flow from operations</b>	<b>\$2,303</b>	<b>\$2,382</b>	<b>\$2,463</b>	<b>\$2,553</b>	<b>\$2,632</b>	<b>\$2,730</b>	<b>\$2,838</b>	<b>\$2,957</b>	<b>\$3,089</b>	<b>\$3,232</b>
Capital replacement costs	\$(26)	\$(341)	\$(325)	\$(335)	\$(345)	\$(32)	\$(399)	\$(34)	\$(753)	\$(1,059)
<b>Net operating cash flow after capital replacement</b>	<b>\$2,277</b>	<b>\$2,041</b>	<b>\$2,138</b>	<b>\$2,218</b>	<b>\$2,287</b>	<b>\$2,699</b>	<b>\$2,439</b>	<b>\$2,923</b>	<b>\$2,336</b>	<b>\$2,173</b>
Capital cost	—	—	—	—	—	—	—	—	—	—
<b>Net project cash flow</b>	<b>\$2,277</b>	<b>\$2,041</b>	<b>\$2,138</b>	<b>\$2,218</b>	<b>\$2,287</b>	<b>\$2,699</b>	<b>\$2,439</b>	<b>\$2,923</b>	<b>\$2,336</b>	<b>\$2,173</b>
<b>Cumulative net project cash flow</b>	<b>\$(39,956)</b>	<b>\$(37,916)</b>	<b>\$(35,777)</b>	<b>\$(33,560)</b>	<b>\$(31,273)</b>	<b>\$(28,574)</b>	<b>\$(26,135)</b>	<b>\$(23,212)</b>	<b>\$(20,876)</b>	<b>\$(18,704)</b>

Exhibit 7-7. Net project cash flow through Phase 1 Blended (YOE dollars in millions) Medium Case (continued)

	2052	2053	2054	2055	2056	2057	2058	2059	2060
Revenue	\$5,981	\$6,191	\$6,408	\$6,634	\$6,867	\$7,108	\$7,358	\$7,617	\$7,885
O&M	\$(2,597)	\$(2,646)	\$(2,700)	\$(2,749)	\$(2,811)	\$(2,871)	\$(2,981)	\$(3,157)	\$(3,240)
<b>Net cash flow from operations</b>	<b>\$3,384</b>	<b>\$3,545</b>	<b>\$3,708</b>	<b>\$3,884</b>	<b>\$4,056</b>	<b>\$4,237</b>	<b>\$4,377</b>	<b>\$4,459</b>	<b>\$4,645</b>
Capital replacement costs	\$(1,001)	\$(1,029)	\$(48)	\$(267)	\$(60)	\$(53)	\$(52)	\$(53)	\$(64)
<b>Net operating cash flow after capital replacement</b>	<b>\$2,383</b>	<b>\$2,517</b>	<b>\$3,661</b>	<b>\$3,618</b>	<b>\$3,996</b>	<b>\$4,185</b>	<b>\$4,326</b>	<b>\$4,406</b>	<b>\$4,580</b>
Capital cost	—	—	—	—	—	—	—	—	—
<b>Net project cash flow</b>	<b>\$2,383</b>	<b>\$2,517</b>	<b>\$3,661</b>	<b>\$3,618</b>	<b>\$3,996</b>	<b>\$4,185</b>	<b>\$4,326</b>	<b>\$4,406</b>	<b>\$4,580</b>
<b>Cumulative net project cash flow</b>	<b>\$(16,320)</b>	<b>\$(13,804)</b>	<b>\$(10,143)</b>	<b>\$(6,525)</b>	<b>\$(2,529)</b>	<b>\$1,655</b>	<b>\$5,981</b>	<b>\$10,387</b>	<b>\$14,968</b>

## Funding

The previous sections of this chapter evaluated the operational viability, breakeven, and project cash flows for the project. These sections illustrated that the project can generate a positive net cash flow from operations but that it requires government funding for construction. This section of the chapter discusses the availability, timing, and magnitude of the various sources of capital funding for each section of the project.

### *Funding sources*

Capital funding will include funds from federal, state, local, and private sources. These sources will be available to the Authority at different times based on the development of the system. As described below, government funding for the IOS is fully identified, and once the IOS begins operating high-speed service, private sources of capital will be available to augment public funding sources to complete the Bay to Basin and Phase 1 Blended. Known and potential funding sources for each phase are described below.

A total of \$6 billion in funding has been identified for the first segment of construction for the IOS, including \$3.3 billion in federal funds and \$2.7 billion in Proposition 1A bond proceeds. Funding for the remaining segments of the IOS is identified and will come from additional Proposition 1A bond funds, federal support, and local funds. Cap and trade funds are available as needed, upon appropriation, as a backstop against federal and local support to complete the IOS. Project cash flows illustrate that the project can support over \$10 billion in private capital through Bay to Basin and additional amounts for the Phase 1 Blended alignment. In addition to these state and private sources, a significant contribution of funds is needed from the federal government. While supported by the Obama Administration, there is substantial discussion underway within the federal government related to both overall transportation funding and high-speed rail funding. Currently, there is no consensus on funding high-speed rail projects. Existing and potential options for new federal programs are presented in Exhibit 7-8.

### *Initial Operating Section*

The IOS will be completed over nine years and in segments. The first segment is fully funded from the following sources (subject to satisfaction of various conditions associated with each):

- State general obligation bonds authorized under the Bond Act approved by California voters as Proposition 1A in 2008
- Federal grants authorized under ARRA and HSIPR for federal fiscal year 2010

The amount of each of these funding sources allocated to the development costs of the first segment (including planning and construction costs) is shown in Exhibit 7-9.

## Exhibit 7-8. Funding sources

Funding Source	Description
American Recovery and Reinvestment Act and U.S. Department of Transportation Annual Appropriations (Federal)	In February 2009, President Obama signed the American Recovery and Reinvestment Act of 2009 (Recovery Act or ARRA). Using the Passenger Rail Investment and Improvement Act of 2008 as a framework, Congress has provided total program funding of \$10.1 billion for new high-speed and intercity passenger rail grants. California's high-speed rail program has received an allocation of \$3.5 billion, or 34 percent of these federal funding sources. In addition, based on the Passenger Rail Investment and Improvement Act framework, Congress allocated High-Speed Intercity Passenger Rail (HSIPR) funding through FY 09 and FY 10 appropriations.
Dedicated Passenger Rail Trust Fund (Federal)	The President's Fiscal Year 2013 budget request for the U.S. Department of Transportation outlined the Administration's six-year proposal, which includes the establishment of a Transportation Trust Fund with a new subaccount for passenger rail. The plan designated \$35 billion for building new corridors or substantially improving existing corridors, at an average level of nearly \$6 billion per year.
Federal Transportation Financing Programs	The federal government has several low-cost debt programs (borrowing tools) that may be accessed by the private sector (and in some instances, the public sector) to help reduce financing costs of the program. These programs include the Transportation Infrastructure Finance and Innovation Act of 1998, the Railroad Rehabilitation and Improvement Financing Program, and Private Activity Bonds.
Proposition 1A, 2008 (State)	The Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century (the Bond Act approved by California voters as Proposition 1A in 2008) authorized the state to issue \$9.95 billion of general obligation bonds, \$9 billion of which will be used to develop a high-speed rail system. This Revised Plan assumes that \$8.2 billion is available for construction after environmental, planning, and support costs for the program are applied.
Cap-and-Trade Program Funds	Assembly Bill 32 (Statutes, 2006, Chapter 488) mandates a reduction of statewide greenhouse gas emissions to 1990 levels by 2020. In accordance with that law, California will implement a market-based cap-and-trade program. Funds from the program can be used to further the purposes of AB 32, including for development and construction of the high-speed rail system.
Locally Generated and Other Revenues	Locally generated revenues can include funds from the use of transit-oriented development, in partnership with local jurisdictions. The Authority and its local municipal partners also plan to target private revenues from passenger stations and other sources of revenue derived from growth and economic activity supported by the project.

**Exhibit 7-9. IOS-First Construction funding sources (YOE dollars in millions)**

	Total	2013	2014	2015	2016	2017
<b>Sources</b>						
Federal grants secured	\$3,316	\$738	\$621	\$633	\$652	\$672
State Bonds (Proposition 1A)	\$2,684	\$597	\$503	\$513	\$528	\$544
<b>Total Sources</b>	<b>\$6,000</b>	<b>\$1,334</b>	<b>\$1,123</b>	<b>\$1,146</b>	<b>\$1,180</b>	<b>\$1,216</b>
<b>Uses</b>						
Capital expenditure	\$6,000	\$1,334	\$1,123	\$1,146	\$1,180	\$1,216
<b>Total Uses</b>	<b>\$6,000</b>	<b>\$1,334</b>	<b>\$1,123</b>	<b>\$1,146</b>	<b>\$1,180</b>	<b>\$1,216</b>

Numbers are subject to rounding

2013 represents the first full year of construction

Once the IOS is under construction and early works have begun on blended improvements in both Northern and Southern California (the bookends), the Authority will begin to build the remaining sections of the IOS with initial attention on closing the rail gap between Bakersfield and Palmdale. As presented in Chapter 4, Business Model, the development of the IOS will need to be funded through government sources because private-sector capital for construction of the IOS is not available given the restrictions of Proposition 1A related to state revenue guarantees.

The Authority has assumed that the percentage of federal funds and matching state or other funds provided will be 80 percent and 20 percent, respectively, consistent with the current HSIPR program. Cap and trade funds are available as needed, upon appropriation, as a backstop against federal and local support. As described below, once the IOS has been completed and operational, the opportunity for private investment is greatly increased, and the expected percentage of funds that could be used to match federal dollars increases substantially.

The funding plan assumes that a total of \$8.2 billion in state Proposition 1A bond funds is available for construction after environmental, planning, and administrative costs are applied. Of that amount, \$2.7 billion will be used for the first segment and \$1.1 billion is set aside for blended improvements, leaving a total of \$4.4 billion to contribute to funding the remainder of the IOS. Under the Authority's Revised Plan, these funds will be used to match with federal funding to close the rail gap from Bakersfield to Palmdale and complete the IOS. Once the bond funds have been used, the required matching funding is assumed to be provided from other locally generated revenues or contributions (such as the types discussed in Exhibit 7-8). Cap and trade funds are available as needed, upon appropriation, as a backstop against federal and local support.

Potential funding sources to complete construction of the IOS in aggregate without regard to individual projects are shown in Exhibit 7-10.

**Exhibit 7-10. Sources and uses for completing the IOS (YOE dollars in millions)**

	Total	2015	2016	2017	2018	2019	2020	2021
<b>Sources</b>								
Federal support	\$20,265	\$2,214	\$2,281	\$2,349	\$3,629	\$3,738	\$3,850	\$2,203
State Bonds (Proposition 1A)	\$4,416	\$554	\$570	\$587	\$907	\$935	\$657	\$206
Other funds	\$650	—	—	—	—	—	\$305	\$345
<b>Total Sources</b>	<b>\$25,331</b>	<b>\$2,768</b>	<b>\$2,851</b>	<b>\$2,936</b>	<b>\$4,537</b>	<b>\$4,673</b>	<b>\$4,813</b>	<b>\$2,754</b>
<b>Uses</b>								
Capital expenditure	\$25,331	\$2,768	\$2,851	\$2,936	\$4,537	\$4,673	\$4,813	\$2,754
<b>Total Uses</b>	<b>\$25,331</b>	<b>\$2,768</b>	<b>\$2,851</b>	<b>\$2,936</b>	<b>\$4,537</b>	<b>\$4,673</b>	<b>\$4,813</b>	<b>\$2,754</b>

Numbers are subject to rounding

### **Bay to Basin**

The development of the Bay to Basin phase will be undertaken concurrent with operation of the IOS. The IOS is expected to be generating revenue and a net cash flow from operations. In Chapter 4, Business Model, the Authority set out the strategy to leverage the value of future revenue from both the IOS and the Bay-to-Basin sections through a concession arrangement that is described in the next section. The Authority has contacted a range of investors and firms that responded to the Request for Expressions of Interest to confirm investment timing and interest. There was agreement that, absent state guarantees, there would be little private capital available to invest into the project until after completion of the IOS and a positive cash flow is demonstrated. There also was agreement that once these conditions were met, substantial private-sector investment interest could be expected consistent with other systems in the world.

Under a scenario in which no private-sector investment is made until completion of Bay-to-Basin construction, development costs would continue to be funded by federal and state resources but reduced by the net operating cash flow from operations in each year. This is, in effect, a “pay as you go” basis. The financial analysis for the funding of the Bay-to-Basin assumes the same level of federal and state and other funding (i.e., 80 percent to 20 percent, respectively).

Based on the analysis, the state Proposition 1A bond proceeds will be fully used by the end of 2021 and an additional \$3.7 billion in local or other funds will be needed to match federal funds to complete construction of the Bay to Basin. This illustrates the need to structure a transaction to monetize the net operating cash flow after operations of the IOS as part of the completion of the Bay to Basin. This is shown on an annual basis in Exhibit 7-11.

**Exhibit 7-11. Sources and uses for completing Bay to Basin—Without private-sector capital (YOE dollars in millions)**

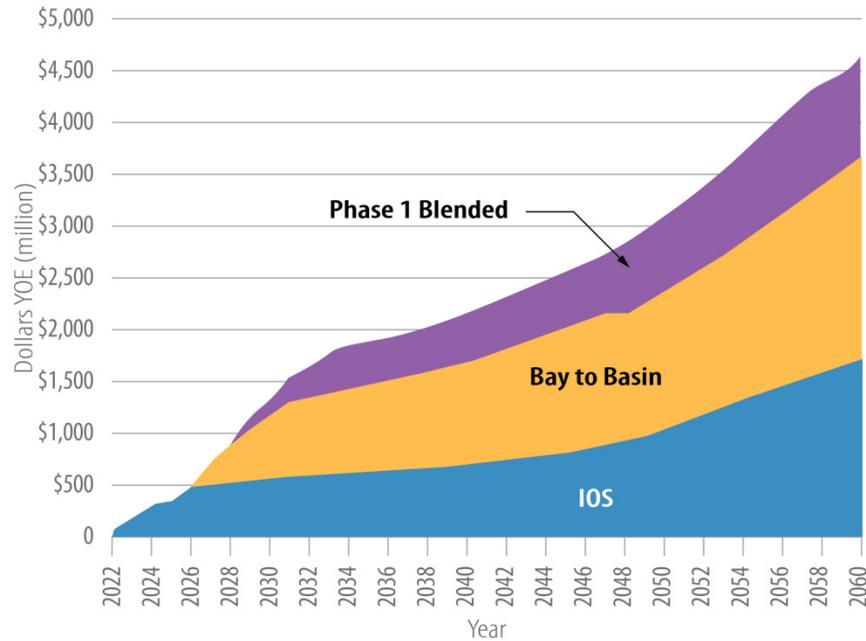
	Total	2021	2022	2023	2024	2025	2026
<b>Sources</b>							
Net operating cash flow after operations	\$1,351	—	\$59	\$179	\$296	\$345	\$473
Federal support	\$14,823	\$1,479	\$3,153	\$3,153	\$3,161	\$3,224	\$654
Other funds	\$3,706	\$370	\$788	\$788	\$790	\$806	\$163
<b>Total Sources</b>	<b>\$19,881</b>	<b>\$1,849</b>	<b>\$4,000</b>	<b>\$4,121</b>	<b>\$4,247</b>	<b>\$4,374</b>	<b>\$1,290</b>
<b>Uses</b>							
Capital expenditure	\$19,869	\$1,849	\$4,000	\$4,120	\$4,243	\$4,371	\$1,286
Capital replacement	\$12	—	—	\$1	\$4	\$4	\$4
<b>Total Uses</b>	<b>\$19,881</b>	<b>\$1,849</b>	<b>\$4,000</b>	<b>\$4,121</b>	<b>\$4,247</b>	<b>\$4,374</b>	<b>\$1,290</b>

Numbers are subject to rounding

### Private-sector capital

As the system develops over time it will generate implicit value through the generation of positive net operating cash flow. Exhibit 7-12 illustrates the growth in net operating cash flow for the Planning Case Scenario for all sections beginning at the commencement of operations in 2022.

**Exhibit 7-12. Planning case net operating cash flow by section (YOE dollars in millions)**



A critical decision will be when those future net cash flows could offer the greatest value to the state. The private sector will value the net operating cash flows after capital replacement to derive an up-front valuation of future cash flows. The private-sector valuation is expected to be greatest once the system is operational. Therefore, this Revised Plan assumes private investment occurs soon after the IOS is operational. The IOS is projected to have a material value to a potential private-sector investor as a stand-alone service.

If the IOS is demonstrating strong ridership and revenues, as forecast, along with overall strong asset operational performance, the private sector also is expected to have interest in valuing the future benefit of the Bay-to-Basin network prior to its completion. The cash flow scenario in Exhibit 7-13 is based on the Authority awarding a concession to a private-sector developer and investor that provides an upfront capital contribution from the private sector to the Authority. The upfront contribution would be calculated based on the private sector's valuation of the future cash flows from the system. The financial analysis has provided a range of estimates for the potential contribution from the private sector based on a range of discount rates for such a transaction.

**Exhibit 7-13. Discounted cash flows for Planning Case—IOS through Bay to Basin (YOE dollars in millions)**

PV date	Discount Rate		
	8%	11%	14%
End 2023	\$14,828	\$10,132	\$7,396

The analysis has been based on the discounting of the net operating cash flow after capital replacement at three illustrative discount rates: 8 percent, 11 percent, and 14 percent. It is more

likely that the private sector would apply a higher discount rate to any net revenue from future sections yet to be completed, as opposed to proven cash flows from existing operational sections, which would support application of a lower discount rate.

Given the magnitude of the estimated value of future cash flows, the Authority will seek to place a concession that is timed to provide private capital to support construction to complete the final part of the Bay-to-Basin section. This approach would allow the private-sector investment to reduce the total government funding required to complete the Bay-to-Basin section.

Taking into account the estimated amount of private-sector investment that could be generated from a concession, a revised amount of federal and state funding was calculated. Using the Planning Case revenue projections, discounted net operating cash flows after capital replacement costs were calculated based on the discount rates described above to arrive at a present value. This present value serves as a proxy for the estimated proceeds the Authority could anticipate receiving from a private sector investor in a full concession transaction. The analysis was based on the assumption that private investment occurs close to the end of 2023, 3 years prior to completion of the Bay-to-Basin section.

For the purpose of illustrating the impact of an investment of private capital, an 11 percent discount rate was selected to discount future net operating cash flows from operations after capital replacement costs. The analysis estimates that \$10.1 billion of proceeds would be made available to the Authority, which could be used to offset state and federal funding contributions for completion of the Bay to Basin. This analysis is presented in Exhibit 7-14.

**Exhibit 7-14. Sources and uses for Bay to Basin with private-sector capital (YOE dollars in millions)**

	Total	2021	2022	2023	2024	2025	2026
<b>Sources</b>							
Net cash flow from operations	\$238	—	\$59	\$179	—	—	—
Private capital	\$10,132	—	—	\$221	\$4,247	\$4,374	\$1,290
Federal support	\$8,353	\$1,479	\$3,153	\$3,721	—	—	—
Other funds	\$1,158	\$370	\$788	—	—	—	—
<b>Total Sources</b>	<b>\$19,881</b>	<b>\$1,849</b>	<b>\$4,000</b>	<b>\$4,121</b>	<b>\$4,247</b>	<b>\$4,374</b>	<b>\$1,290</b>
<b>Uses</b>							
Capital expenditure	\$19,869	\$1,849	\$4,000	\$4,120	\$4,243	\$4,371	\$1,286
Capital replacement	\$12	—	—	\$1	\$4	\$4	\$4
<b>Total Uses</b>	<b>\$19,881</b>	<b>\$1,849</b>	<b>\$4,000</b>	<b>\$4,121</b>	<b>\$4,247</b>	<b>\$4,374</b>	<b>\$1,290</b>

Numbers are subject to rounding

The total reduction in federal and other funding of approximately \$6.5 billion and \$2.5 billion, respectively, resulting from the private-sector investment are offset by \$1.4 billion in reduced cash flow used for the “pay-as-you-go” funding described earlier. These figures would vary depending on the actual value invested by the private sector.

The timing for award of a concession contract will be determined based on early ridership results and projected capital return requirements and concession values. As revenues are discounted to arrive at an upfront concession value, a delay will increase the future value amount if net cash flow projections are held constant. In the scenario above, a transaction occurring 1 year later in late 2024 would provide an additional \$800 million in concession value to the state; however, the delay also would affect the construction schedule.

Exhibit 7-15 illustrates a complete funding plan for the IOS through Bay to Basin from 2013 until 2026. This is based on leveraging private capital during the completion of Bay to Basin as described above.

Total capital costs for completing Bay to Basin are \$51.2 billion in YOE dollars. The funding plan in Exhibit 7-16 summarizes the relative levels of funding required or available from various sources, including federal support, state bonds, and other funds (local and private development). Cap and trade funds are available as needed, upon appropriation, as a backstop against federal and local support to complete the IOS.

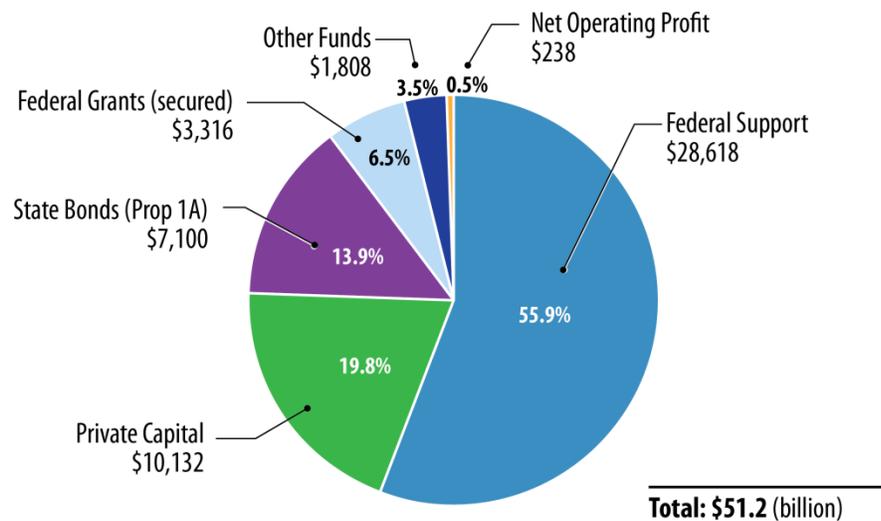
Exhibit 7-16 assumes a private-sector concession provides \$10.1 billion. The key to reducing total government funding is the private-sector concession assumption that occurs in 2023. While \$10.1 billion represents a significant value in 2023 terms, in 2011 terms it is the equivalent of \$7.3 billion.

**Exhibit 7-15. Total sources and uses for IOS to Bay to Basin assuming private-sector investment in 2023 (2013 to 2026) (YOE dollars in millions)**

	Total	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
<b>Sources</b>															
Net cash flow from operations	\$238	—	—	—	—	—	—	—	—	—	\$59	\$179	—	—	—
Private capital	\$10,132	—	—	—	—	—	—	—	—	—	—	\$221	\$4,247	\$4,374	\$1,290
Federal grants secured	\$3,316	\$738	\$621	\$633	\$652	\$672	—	—	—	—	—	—	—	—	—
Federal support	\$28,618	—	\$0	\$2,214	\$2,281	\$2,349	\$3,629	\$3,738	\$3,850	\$3,683	\$3,153	\$3,721	—	—	—
State Bonds (Proposition 1 A)	\$7,100	\$597	\$503	\$1,066	\$1,098	\$1,131	\$907	\$935	\$657	\$206	—	—	—	—	—
Other funds	\$1,808	—	—	—	—	—	—	—	\$305	\$715	\$788	—	—	—	—
<b>Total Sources</b>	<b>\$51,212</b>	<b>\$1,334</b>	<b>\$1,123</b>	<b>\$3,914</b>	<b>\$4,031</b>	<b>\$4,152</b>	<b>\$4,537</b>	<b>\$4,673</b>	<b>\$4,813</b>	<b>\$4,603</b>	<b>\$4,000</b>	<b>\$4,121</b>	<b>\$4,247</b>	<b>\$4,374</b>	<b>\$1,290</b>
<b>Uses</b>															
Capital expenditures															
IOS-First Construction	\$6,000	\$1,334	\$1,123	\$1,146	\$1,180	\$1,216	—	—	—	—	—	—	—	—	—
IOS	\$25,331	—	—	\$2,768	\$2,851	\$2,936	\$4,537	\$4,673	\$4,813	\$2,754	—	—	—	—	—
Bay to Basin	\$19,869	—	—	—	—	—	—	—	—	\$1,849	\$4,000	\$4,120	\$4,243	\$4,371	\$1,286
Capital replacement	\$12	—	—	—	—	—	—	—	—	—	—	\$1	\$4	\$4	\$4
<b>Total Uses</b>	<b>\$51,212</b>	<b>\$1,334</b>	<b>\$1,123</b>	<b>\$3,914</b>	<b>\$4,031</b>	<b>\$4,152</b>	<b>\$4,537</b>	<b>\$4,673</b>	<b>\$4,813</b>	<b>\$4,603</b>	<b>\$4,000</b>	<b>\$4,121</b>	<b>\$4,247</b>	<b>\$4,374</b>	<b>\$1,290</b>

Numbers are subject to rounding

2013 represents the first full year of construction

**Exhibit 7-16. Relative amounts of sources of funding for Bay to Basin**

The commercial arrangements underlying this transaction would be developed as the procurement strategy develops. In today's dollars, \$7.3 billion represents a significant private-sector investment within infrastructure. However, it can be compared to a range of international infrastructure investment transactions, such as the acquisition by Macquarie of the French toll roads APRR valued at \$10 billion; Ferrovial's acquisition of BAA (airport owner/operator) in the U.K. for \$14 billion; and the CKI acquisition of the EdF distribution network assets for \$9 billion in the U.K. in 2011. Furthermore, following the sale of the HS1 high-speed line in the U.K. for around \$3 billion in 2011, the U.K. government has made a clear statement it intends to develop the next HS2 line using government funds and will sell the asset upon completion. A recent study suggests the value of the sale could be approximately \$9 billion.

This Revised Plan recognizes that the amount to be financed is very large in current private-sector investment terms and the transaction would likely need to encompass low-cost federal debt programs and be staged to allow for market capacity and competition.

As the program develops, the Authority will carefully consider the appropriate transaction structure, including the merits of a single concession incorporating infrastructure and operations or the more common European approach of separating infrastructure management from train operations through a track access charge structure, as discussed in greater detail in Chapter 4, Business Model.

## Phase 1 Blended

The Phase 1 Blended section is estimated to cost an additional \$17.2 billion in YOE dollars over Bay to Basin. The blended system construction period extends from 2014 to 2028. Much of the development of the improvements in the Los Angeles Basin and San Francisco Bay Area will be managed and contracted by local agencies with authority over these corridors. In many cases, the Authority will be a planning and funding partner working with local agencies to acquire federal funds and coordinate the use of bond funds. Early improvements will be funded by the \$950 million in bond funds dedicated to local connectivity projects and an additional \$2.2 billion described in recent Memoranda of Understanding between the Authority and local agencies (excluding capital costs for Caltrain rolling stock). For planning

purposes, funding of the \$2.2 billion is assumed to include \$1.1 billion in state Proposition 1A funds, \$600 million in new federal funds which are not committed, and \$500 million in other funds. This amount would fund early projects beginning in 2014 and extending to 2022. The completion of Phase 1 Blended is assumed in 2028 and its full development would require further government and other funding.

The incremental revenues from Phase 1 Blended create an additional source of private capital. When discounted using the 8 percent to 14 percent range discussed earlier, the incremental Phase 1 Blended net cash flows generate between \$2.1 billion and \$4.5 billion at the time of the Bay-to-Basin monetization, which is assumed to occur in 2027. Comparing these ranges to the incremental cost to complete Phase 1 Blended, the future value represents between 12 and 26 percent of the incremental Phase 1 Blended cost in YOE dollars.

Therefore, even if the net cash flows from IOS and Bay to Basin are awarded as a concession, it would be feasible for additional Phase 1 Blended cash flows to provide a potential funding source for developing Phase 1 Blended as described above for Bay to Basin. From a commercial perspective, the monetization of Phase 1 Blended would need to be considered carefully in advance of letting a concession for the Bay-to-Basin section to ensure future development was adequately addressed within the contract.

Having considered the future value of Phase 1 Blended, a portion of the development costs will have to be publicly funded. This funding requirement will be many years into the future and will be dependent on new federal or other government programs. It is not possible to provide specific details on future funding programs.

**Exhibit 7-17. Sources and uses—Phase 1 Blended with private-sector capital (YOE dollars in millions)**

	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
<b>Sources</b>																
Private capital	\$2,986	—	—	—	—	—	—	—	—	—	—	—	—	—	\$441	\$2,545
Federal support	\$9,956	\$50	\$56	\$58	\$60	\$61	\$63	\$65	\$235	\$337	\$1,756	\$1,809	\$1,863	\$1,919	\$1,624	—
State bonds (Proposition 1A)	\$1,100	\$66	\$75	\$77	\$80	\$82	\$84	\$87	\$313	\$236	—	—	—	—	—	—
Other funds	\$3,123	\$50	\$56	\$58	\$60	\$61	\$63	\$65	\$235	\$232	\$439	\$452	\$466	\$480	\$406	—
<b>Total sources</b>	<b>\$17,166</b>	<b>\$165</b>	<b>\$187</b>	<b>\$193</b>	<b>\$199</b>	<b>\$205</b>	<b>\$211</b>	<b>\$217</b>	<b>\$782</b>	<b>\$805</b>	<b>\$2,196</b>	<b>\$2,261</b>	<b>\$2,329</b>	<b>\$2,399</b>	<b>\$2,471</b>	<b>\$2,545</b>
<b>Uses</b>																
Phase 1 Blended capital expenditure	\$17,166	\$165	\$187	\$193	\$199	\$205	\$211	\$217	\$782	\$805	\$2,196	\$2,261	\$2,329	\$2,399	\$2,471	\$2,545
<b>Total uses</b>	<b>\$17,166</b>	<b>\$165</b>	<b>\$187</b>	<b>\$193</b>	<b>\$199</b>	<b>\$205</b>	<b>\$211</b>	<b>\$217</b>	<b>\$782</b>	<b>\$805</b>	<b>\$2,196</b>	<b>\$2,261</b>	<b>\$2,329</b>	<b>\$2,399</b>	<b>\$2,471</b>	<b>\$2,545</b>

Numbers are subject to rounding

## Alternative funding scenarios

This Revised Plan presents a Planning Case based on the best information and assumptions available to the Authority at this time. However, a range of events and actions can impact the project schedule, cost, and funding requirements. This section identifies the following three alternative scenarios to illustrate the impact on funding requirements if key portions of the plan change over time:

- Extending the construction schedule by 5 years
- Reducing revenue forecasts to low ridership
- Increasing construction costs

### ***Extending the construction schedule by five years***

The project schedule is closely linked to the availability of funding. The current planning schedule illustrates a build out from 2013 to 2028, or 15 years for the blended service.

Exhibit 7-18 illustrates the effect of extending the schedule and shows the change in financial requirements if the project were extended to a 20-year construction timeframe. This is based on the Planning Case ridership and the 11 percent discount factor. Similar increases, primarily due to inflation, would occur if the project schedule extended longer than 20 years.

The Planning Case illustrated in Exhibit 7-18 represents the Medium Ridership Scenario discussed earlier in this chapter. Increasing the construction schedule by 5 years would increase costs approximately 1.7 percent. As revenues are extended into the future, it would also reduce the amount of revenue generated by the project (see last column) over the analysis period and the amount and timing of private-sector investment. This is estimated to reduce the private-sector investment amount by nearly \$700 million that, in turn, requires a commensurate increase from federal and other public sources of funds.

**Exhibit 7-18. Extending the construction schedule (YOE dollars in millions)**

	Planning Case	Extended Schedule Scenario
<b>Sources</b>		
Net cash flow from operations	\$238	\$238
Federal support	\$41,890	\$41,454
State bonds (Proposition 1A)	\$8,200	\$8,200
Other funds (state, local, private)	\$4,931	\$7,211
Private capital	\$13,118	\$12,411
<b>Total Sources</b>	<b>\$68,377</b>	<b>\$69,514</b>
<b>Uses</b>		
Phase 1 Blended capital cost <sup>1</sup>	\$68,377	\$69,514
<b>Total Uses</b>	<b>\$68,377</b>	<b>\$69,514</b>

Numbers are subject to rounding

<sup>1</sup>Capital costs include capital replacement costs

### **Reducing revenues**

Ridership and revenue levels drive cash flow from operations and the cash flow available to support capital purposes. The Planning Case illustrated earlier in this chapter is based on the Medium Ridership Scenario. Exhibit 7-19 illustrates the impact to the project if the low ridership and revenue projections are achieved. This is based on the Planning Case ridership and the 11 percent discount factor.

**Exhibit 7-19. Reducing ridership and revenues (YOE dollars in millions)**

	Planning Case	Low Revenue Scenario
<b>Sources</b>		
Net cash flow from operations	\$238	\$86
Federal support	\$41,890	\$45,897
State bonds (Proposition 1A)	\$8,200	\$8,200
Other funds (state, local, private)	\$4,931	\$5,834
Private capital	\$13,118	\$8,360
<b>Total Sources</b>	<b>\$68,377</b>	<b>\$68,377</b>
<b>Uses</b>		
Phase 1 Blended capital cost <sup>1</sup>	\$68,377	\$68,377
<b>Total Uses</b>	<b>\$68,377</b>	<b>\$68,377</b>

Numbers are subject to rounding

<sup>1</sup>Capital costs include capital replacement costs

As illustrated in Exhibit 7-19, assuming the Low Ridership Scenario reduces the amount of revenue generated by the project (see last column) over the analysis period. This is estimated to reduce private-sector investment amount and net cash flow from operations by \$4.8 billion that, in turn, requires a commensurate increase from federal and other public sources of funds.

### **Increasing construction costs**

Construction costs impact the amount of funding required. Exhibit 7-20 shows how an increase in construction costs impacts various funding sources. This scenario assumes that the costs for the system are equal to the high cost of building the Phase 1 Blended system.

As illustrated in Exhibit 7-20, increasing the construction costs for the project by \$11.4 billion (see last column) requires a similar increase in government funding estimated at \$8.8 billion from federal sources and \$2.6 billion in other funds.

Each alternative funding scenario, extended construction schedule, lower revenues, and higher construction costs, results in a need for additional public funds. Should additional public funds not be available, the project phasing, scoping, or schedule would be negatively affected.

**Exhibit 7-20. Total sources and uses of funds—increased construction costs (YOE dollars in millions)**

	Planning Case	Increased Construction Costs Scenario
<b>Sources</b>		
Net cash flow from operations	\$238	\$238
Federal support	\$41,890	\$50,648
State bonds (Proposition 1A)	\$8,200	\$8,200
Other funds (state, local, private)	\$4,931	\$7,548
Private capital	\$13,118	\$13,118
<b>Total Sources</b>	<b>\$68,377</b>	<b>\$79,752</b>
<b>Uses</b>		
Phase 1 Blended capital cost <sup>1</sup>	\$68,377	\$79,752
<b>Total Uses</b>	<b>\$68,377</b>	<b>\$79,752</b>

Numbers are subject to rounding

## Summary

The financial analysis has used the cost and revenue estimates for the system to examine the overall economics and funding requirement of the program. The results demonstrate the following:

- Funding for the key initial operating segment from the Central Valley to the Los Angeles Basin is fully identified, will not require an operating subsidy, will generate positive cash flow to attract future investment, and will close the state's rail gap with the country's first dedicated high-speed rail system.
- The system is forecast to produce positive net cash flow from operations after capital replacement immediately following commencement of operations, even under a Low Revenue Scenario. Breakeven revenues are estimated at \$218 million in 2022, which is 55 percent below the first year high estimate and 20 percent below the low estimate.
- Private-sector development and operation of the system is expected from the outset of construction and operations. Private-sector capital is anticipated once revenues are proven through completion of an IOS, and is a potential option to fund the final several years of construction under the Bay-to-Basin section. Private-sector investment could exceed \$10 billion in year-of-expenditure terms.

