

Pacific Coast
COLLABORATIVE

Leadership now
for a sustainable tomorrow



High Speed Rail

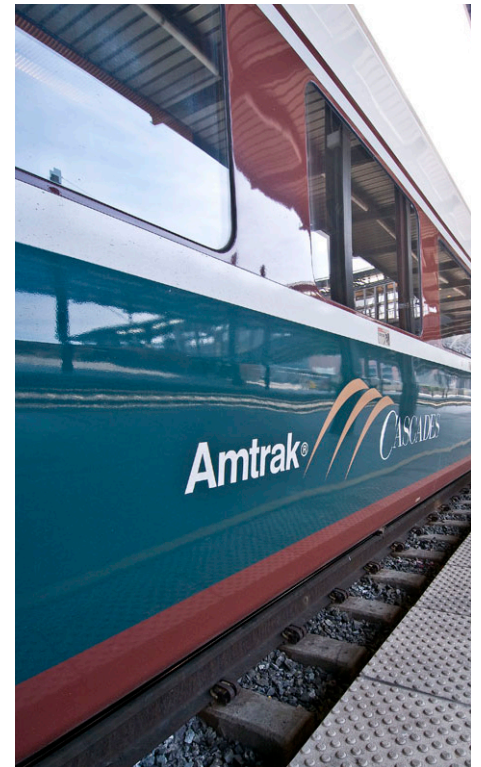
on the Pacific Coast

Released for comment and discussion by the Premier of British Columbia and the Governors of Washington, Oregon and California on November 16, 2010.

1.0 Introduction

At the February 2010 Pacific Coast Collaborative Leaders' Forum, the Governors of California, Oregon and Washington and the Premier of British Columbia released for public comment and discussion "Vision 2030: Positioning Pacific North America for Sustainable Prosperity." This document highlights that, over the next 20 years, "the jurisdictions along North America's Pacific Coast are poised to emerge as a mega-region and global economic powerhouse driven by innovation, energy, geographic location, and sustainable resource management, attracting new jobs and investment while enhancing an already unparalleled quality of life."

A key component of this vision is high-speed rail. In Vision 2030, the Governors and Premier envision environmentally friendly, high-speed rail corridors in operation throughout the region in 2030, facilitated by public-private partnerships; with high-speed rail corridors connecting San Diego to Sacramento, and Portland to Seattle and Vancouver, British Columbia. In their Action Plan on Innovation, Environment and Economy, the Governors and the Premier directed their appropriate agencies and officials to examine going further still to undertake a joint feasibility study for their consideration on methods to supplement and leverage existing and planned high-speed rail investments to fully connect the region from San Diego through Portland and Seattle to Vancouver, British Columbia. This document represents Phase 1 of the requested study.





2.0 Why High-Speed Rail?

Rail is an efficient transportation mode that saves energy and reduces greenhouse gas emissions. A region-wide high-speed rail corridor in 2030 offers the following benefits:

Growing our economy: Fast, reliable transportation is vital to the economic growth of individual jurisdictions within the Pacific Coast region and to the region as a whole. A high-speed rail network connects people and goods, which promotes trade and tourism. In addition, rail travel reduces single occupancy vehicle miles traveled, which contributes to significant savings in congestion costs. In addition to the family-wage jobs created to build, operate and maintain a high-speed rail system, centralized transportation hubs provide opportunity for economic development and jobs for businesses along the corridor.

Protecting our environment: A high-functioning regional rail corridor significantly reduces fuel consumption and emissions by taking cars and trucks off the road and reducing single occupancy vehicle miles traveled.

Improving our quality of life: President Barack Obama presented the following vision when he released his strategic plan for high-speed rail in America: “Imagine boarding a train in the center of a city ... whisking through towns at speeds over 100 miles an hour, walking only a few steps to public transportation, and ending up just blocks from your destination.” Less time in traffic, better access to existing and new jobs, more efficient flow of goods and lower greenhouse emissions all contribute to an enhanced quality of life.

Recognizing these benefits, the Governors and the Premier seek to create a high-speed rail network that would build on rail corridors that now connect San Diego to Sacramento and Portland to Seattle and Vancouver, B.C. Investment in a regional high-speed rail network would complement the recent and substantial federal investment through the American Recovery and Reinvestment Act for high-speed intercity passenger rail planning and infrastructure as well as the historical investments by state and provincial governments.

3.0 Vision 2030 and High-Speed Rail – The Opportunity

Passenger rail is already an important mode of travel within and between California, Oregon, Washington and British Columbia. Significant efforts and investments in the hundreds of millions of dollars have been made in the California and Pacific Northwest Corridors over the past 20 years.

The Pacific Coast Collaborative vision for high-speed rail builds on the significant work already undertaken in these two corridors. High-speed rail will connect San Diego to Sacramento and Portland to Seattle and Vancouver, B.C., carrying more than 120 million passengers per year, thus reducing greenhouse gas emissions and easing congestion on the roads and in the skies. A fast and efficient rail system will create thousands of permanent new jobs, further thin the international border and exponentially expand the Pacific Coast economy.

As recognized in Vision 2030, high-speed rail within and between California, Oregon, Washington and British Columbia is now envisioned to occur within two distinct corridors: the California Corridor and the Pacific Northwest Corridor. The vision is for passengers to travel at top speeds of 90 to 220 mph (145 and 354 km/h) on most segments of the corridors, varying by operational and geographic considerations in each jurisdiction. Average speeds along the corridors would increase significantly compared to current-day speeds. This would allow rail service to become more competitive with other travel modes such as private vehicles and air. Services would operate with stops at major centers and with connections to other cities within the corridors.

The Pacific Coast Collaborative *Action Plan* poses the question of whether the vision could potentially be expanded to include high-speed rail services fully operating from California to British Columbia.

The rail routes that make up the Pacific Coast Collaborative vision for high-speed rail will experience incremental improvements over the next two decades, with greater speeds and capacity bringing different segments to different high-speed rail standards. Improvements will be subject to availability of funding and market conditions such as oil prices, carbon pricing, technology advancements, population growth and density, travel markets and investment feasibility.





4.0 What is High-Speed Rail?

The high-speed rail segment of Vision 2030 was, in part, premised on the work undertaken through the U.S. High-Speed Intercity Passenger Rail Program. High-speed rail generally refers to passenger rail service that operates significantly faster than normal rail traffic. There are a number of different definitions for high-speed rail in use worldwide, with no single standard prevailing.

The U.S. definition of high-speed rail specifies a lower minimum speed than the definition used in other parts of the world. The U.S. Federal Railroad Administration (FRA) defines “high-speed rail” in three ways:

Emerging High-Speed Rail: Developing corridors of 100–500 miles (160–800 km), with strong potential for future high-speed rail regional and/or express service. Top speeds of up to **90–110 mph (145–177 km/h)** on primarily shared track (eventually using positive train control technology), with advanced grade crossing protection or separation. Intended to develop the passenger rail market and provide some relief to other modes.

High-Speed Rail – Regional: Relatively frequent service between major and moderate population centers 100–500 miles (160–800 km) apart, with some intermediate stops. Top speeds of **110–150 mph (177–240 km/h)**, grade-separated, with some dedicated and some shared track (using positive train control technology). Intended to relieve highway and, to some extent, air capacity constraints.

High-Speed Rail – Express: Frequent, express service between major population centers 200–600 miles (320–965 km) apart, with few intermediate stops. Top speeds of **at least 150 mph (240 km/h)** on completely grade-separated, dedicated rights-of-way (with the possible exception of some shared track in terminal areas).

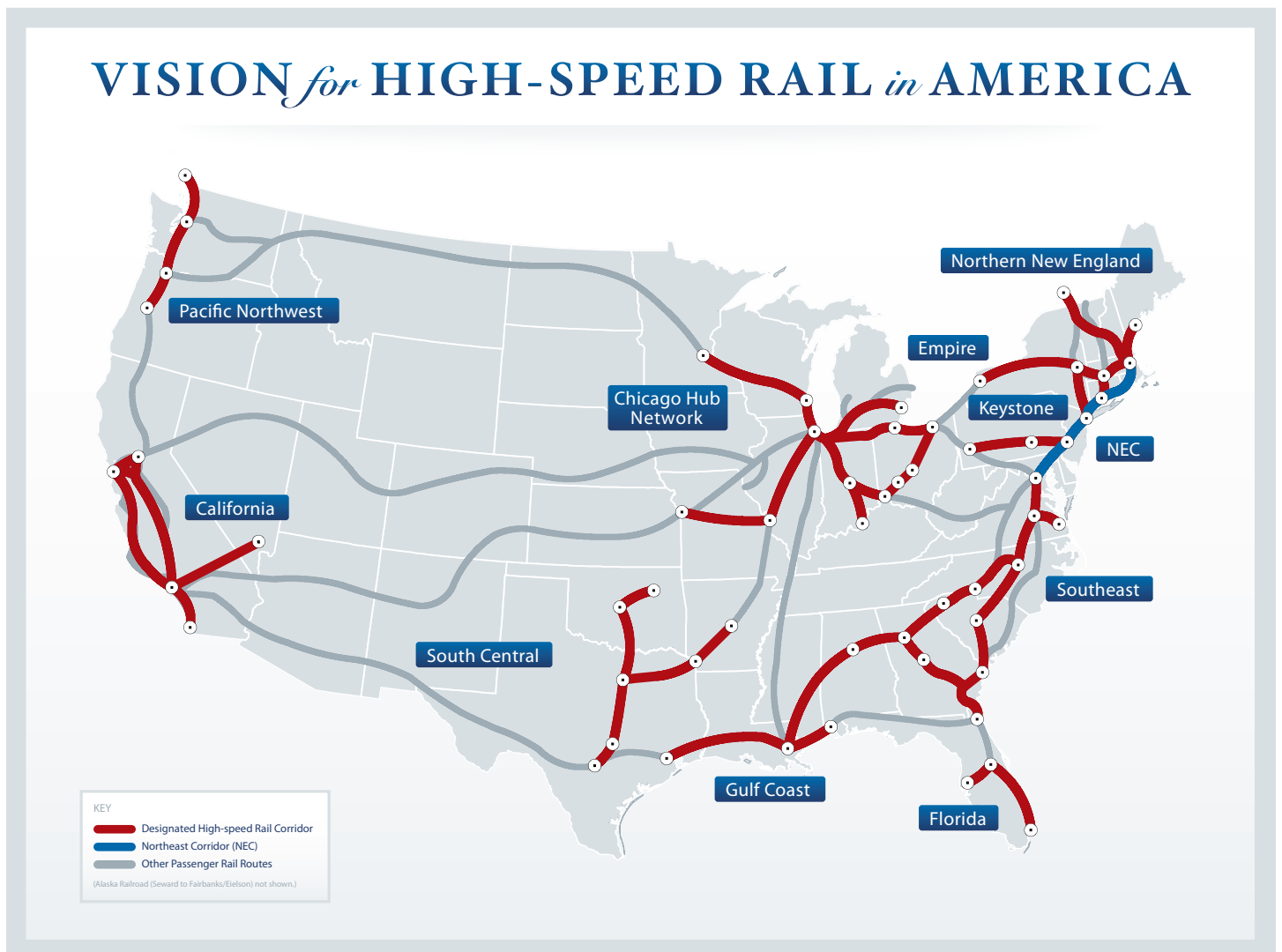
Today, one rail line in the United States meets the FRA definition of High-Speed Rail Express — Amtrak’s *Acela Express* service, which runs the Northeast Corridor from Boston via New York, Philadelphia and Baltimore to Washington, D.C. This line runs at speeds averaging 68 mph (109 km/h) for the entire distance but briefly reaches 150 mph (240 km/h).

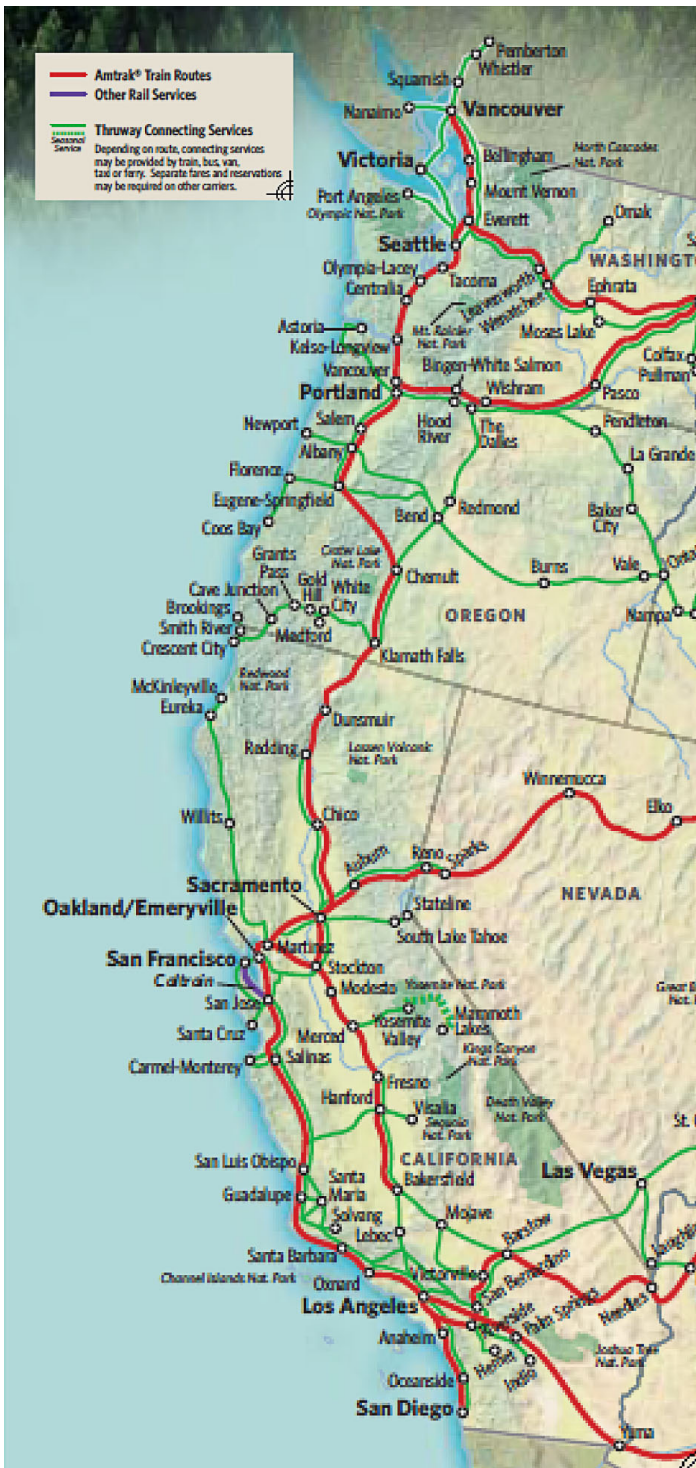
5.0 Current High-Speed Rail on the Pacific Coast

In February 2009, as part of the American Recovery and Reinvestment Act, the U.S. Congress allocated \$8 billion to be granted to states for inter-city rail projects, with “priority to projects that support the development of intercity high-speed rail service.”

In April 2009, the FRA released its strategic plan describing the agency’s vision for developing high-speed rail in the United States. The plan designated ten high-speed rail corridors, including the California Corridor (Sacramento, San Francisco, San Jose, Los Angeles and San Diego) and the Pacific Northwest Corridor (Eugene, Portland, Seattle and Vancouver, B.C.).

The FRA received more than \$57 billion in requests from 34 states for the \$8 billion allocation. In January 2010, an announcement was made on which states received funding. A second round of High-Speed Intercity Passenger Rail funding was announced in October 2010. In total, the California Corridor received \$3.2 billion and the Pacific Northwest Corridor received \$638 million.





An overview of the rail routes throughout the Pacific Coast.

5.1 California

5.1.1 San Joaquin Corridor (Bakersfield-Oakland-Sacramento)

The 365 mile (587 km) San Joaquin train route, which is operated by Amtrak in partnership with the California Department of Transportation, is the fifth-busiest rail corridor in the Amtrak system. The corridor runs 316 miles (508 km) from Oakland to Bakersfield and 49 miles (79 km) between Sacramento and Stockton. There are 13 intermediate stops between Oakland and Bakersfield and two additional stops from Stockton to Sacramento. Current daily rail service within the San Joaquin Corridor includes:

- **Bakersfield to Oakland:** Four daily round-trips; travel time averages 6 hours, 9 minutes
- **Bakersfield to Sacramento:** Two daily round-trips; travel time averages 5 hours, 16 minutes

Amtrak *Thruway* provides bus service to the route's northern terminals. Connecting buses run between Stockton and Sacramento for trains serving Oakland, and between Stockton, Oakland and San Francisco for trains serving Sacramento. Connecting bus service is integral to delivering passengers from distant cities to rail stations on all three California rail corridors. Bus service is especially important on the San Joaquin route, where more than half of passengers connect to a *Thruway* bus on one or both ends of their rail journey.

The maximum track speed on the San Joaquin Corridor is 79 mph (127 km/h). The average speed between Oakland and Bakersfield is 50 mph (80 km/h). The average speed between Sacramento and Bakersfield is 53 mph (85 km/h).

From 1990 to 2005, more than \$516 million has been invested in capital improvements along the San Joaquin Corridor.

5.1.2 Capital Corridor (Auburn-Sacramento-Oakland-San Jose)

The 168 mile (272 km) Capital Corridor train route is operated by Amtrak in partnership with the California Department of Transportation and administered by the Capital Corridor Joint Powers Authority. It is the third-busiest rail corridor in the Amtrak system. The Corridor runs 134 miles (216 km) between Sacramento and San Jose and 35 miles (56 km) from Sacramento to Auburn. There are 16 stops along the entire length of the Corridor, including two intermediate stops between Auburn and Sacramento and 11 intermediate stops between Sacramento and San Jose. The current top speed on the Capital Corridor is 79 mph (127 km/h), with an average

of 50 mph (80 km/h) between Sacramento and Oakland, 43 mph (69 km/h) between Oakland and San Jose, and 34 mph (55 km/h) between Auburn and Sacramento.

Current weekday rail service within the Capital Corridor includes:

- **Sacramento to Oakland:** Sixteen weekday round-trips; travel time averages 1 hour, 48 minutes
- **Oakland to San Jose:** Seven weekday round-trips; travel time averages 1 hour, 3 minutes
- **Auburn to Sacramento:** Two weekday round-trips; travel time averages 1 hour, 2 minutes

From 1990 to 2005, more than \$269 million has been invested in capital improvements along the Capital Corridor.

5.1.3 Pacific Surfliner Corridor (San Luis Obispo-Santa Barbara-Los Angeles-San Diego)

The Pacific Surfliner is a 350-mile (563 km) train route serving communities on the coast of Southern California between San Diego and San Luis Obispo. The route is operated by Amtrak in partnership with the California Department of Transportation and is the second-busiest rail corridor in the Amtrak system. The Pacific Surfliner operates 11 daily trains each way between Los Angeles and San Diego on weekdays and 12 trains each way on weekends. The trip from San Diego to San Luis Obispo takes about eight-and-a-half hours, for an average speed of 43 mph (69 km/h). The maximum track speed is 79 miles per hour (127 km/h) in and north of Los Angeles County; in portions of Orange County and San Diego County, higher track speeds of 90 mph (140 km/h) are permitted due to the use of automatic train stops.

Current weekday rail service within the Corridor includes:

- **San Diego to Los Angeles:** Eleven round-trips; travel time averages 2 hours, 44 minutes
- **Los Angeles to Santa Barbara:** Five round-trips; travel time averages 2 hours, 42 minutes
- **Santa Barbara to San Luis Obispo:** Two round-trips, travel time averages 2 hours, 40 minutes

From 1990 to 2005, approximately \$1.2 billion has been invested in capital improvements along the Pacific Surfliner Corridor.

5.2 Pacific Northwest Corridor (Oregon, Washington and British Columbia)

The 466 mile (750 km) Cascades train route is operated by Amtrak in partnership with Washington, Oregon and British Columbia. The corridor runs 156 miles (251 km) from Vancouver, B.C., south to Seattle and continues 310 miles (499 km) south via Portland to Eugene. There are 18 stops along the entire length of the corridor: five in Oregon, 12 in Washington and one in British Columbia.

The current top speed on the Pacific Northwest Corridor is 79 mph (127 km/h), and is achieved on only small sections of the line. The host railroad will not permit operations faster than 90 mph (145 km/h) on its shared tracks (tracks shared between passenger and freight rail operations). The average speed, including station dwell times, for the entire corridor is 47 mph (76 km/h).

These overall corridor speeds are as follows for the key segments:

- **Eugene to Portland:** Average speed of 42 mph (68 km/h) and top speed of 79 mph (127 km/h)
- **Portland to Seattle:** Average speed of 53 mph (85 km/h) and top speed of 79 mph (127 km/h)
- **Seattle to Vancouver, B.C.:** Average speed of 40 mph (64 km/h) and top speed of 79 mph (127 km/h)

Current rail service within the corridor includes:

- **Eugene to Portland:** Two daily round-trips; travel time of 2 hours, 35 minutes
- **Portland to Seattle:** Four daily round-trips; travel time of 3 hours, 30 minutes
- **Seattle to Vancouver, B.C.:** Two daily round-trips; travel time of 4 hours

Since 1994, more than \$430 million has been invested in capital improvements along the Pacific Northwest Corridor. Washington, Oregon and British Columbia have and continue to make substantial investments in capital infrastructure. Washington and Oregon continue to invest substantially in corridor operations.



6.0 Currently Planned High-Speed Rail on the Pacific Coast

6.1 California

6.1.1 California Emerging High-Speed Rail

Investment will continue in the three California corridors to meet the definition of Emerging High-Speed Rail and to act as significant feeder services to California High-Speed Rail Express service.

The Pacific Surfliner will have Positive Train Control signalling installed, which will allow for greater safety, increased speeds to 90 mph (145 km/h) on additional segments of track on the south end of the railroad and tighter train spacing. Investments will increase capacity on the entire route. Caltrans also plans to initiate 110 mph (177 km/h) running speeds in the coming years on a section between Santa Ana and San Juan Capistrano. The north end of the service will act as a High-Speed Rail Express feeder service from populations between San Luis Obispo and Santa Barbara to a transfer station at Burbank or Los Angeles. From San Diego and Orange Counties, the south end of the service will act as a feeder service to High-Speed Rail Express service, using a transfer station first at Anaheim and later at Irvine as High-Speed Rail Express is extended south.

The San Joaquin route will also take advantage of Positive Train Control to increase the top speed on the route between Stockton and Bakersfield from 79 mph (127 km/h) to 90 mph (145 km/h), meeting Emerging High-Speed Rail standards. The San Joaquin route will serve as a feeder to Phase 1 of the High-Speed Rail Express service, with a transfer station at Merced for populations from the East Bay area and Sacramento/Stockton areas. Additionally, transfer stations in Fresno and Bakersfield will allow passengers to transfer to the San Joaquin service to reach cities not served by High-Speed Rail Express. As High-Speed Rail Express Phase 2 is implemented, the San Joaquin route will continue to serve as a feeder for intermediate stations not served by High-Speed Rail Express service.

The Capitol Corridor will achieve Emerging High-Speed Rail standards by running at top speeds of 90 mph (145 km/h) on certain segments with the installation of Positive Train Control. The Capitol Corridor will serve as an important feeder to High-Speed Rail Express service, with San Jose as the transfer station. The Capitol Corridor also will serve as a feeder route for populations from Sacramento through the East Bay area.

6.1.2 California High-Speed Rail Express

The proposed California High-Speed Rail Express system encompasses more than 800 route miles (1,287 km) and will provide intercity travel between the major metropolitan centers of Sacramento; the San Francisco Bay area; the Central Valley, Los Angeles, area; and the Inland Empire, Orange County and San Diego areas. The system is envisioned as state of the art, electrically powered, high-speed rail technology.

The California High-Speed Rail Express system will be capable of speeds up to 220 mph (354 km/h) and designed for an ultimate speed of 250 mph (402 km/h) on a fully grade-separated alignment, with an expected trip time from San Francisco to Los Angeles of two hours and forty minutes or less. This will result in an approximate average speed of 165 mph (266 km/h),

based on the 432 mile (694 km) distance. Part of the system will include interface with commercial airports, mass transit and the highway network.

The California High-Speed Rail Express system will operate primarily on exclusive track, with portions of the route shared with other passenger rail operations in the Caltrain Corridor in the San Francisco Bay area.

Depending on the alignment and station design options, the cost to implement the full state-wide California High-Speed Rail Express system is anticipated to be approximately \$43 billion. Regional sections of the project will be delivered in phases. The first phase of the project, from Orange County (Anaheim) to San Francisco, is estimated to have a construction cost of \$36 billion, with an estimated completion date of 2020.

In November 2008, California voters approved the issuance of \$9 billion in state bonds for a High-Speed Rail Express initiative. This state commitment has been complemented by an additional \$3 billion from the American Reinvestment and Recovery Act. This funding will allow California to proceed with the first segment of Phase 1, defined as Anaheim to San Francisco. The High-Speed Rail Authority is now evaluating which of four possible segments of Phase 1 will be the first to be funded and constructed.



6.1.3 Pacific Northwest Corridor

The Pacific Northwest Rail Corridor recently received \$638 million in U.S. federal funding. The resulting projects will complement more than \$430 million in capital investments made in the corridor since 1994. The majority of the \$638 million will be invested in the Seattle to Portland section of the Corridor. This project will add two daily round trips for a total of six, and will increase reliability from 62 percent to more than 88 percent.

Once completed, these investments will allow for a portion of the corridor to be operated at 90 mph (145 km/h), thereby achieving Emerging High-Speed Rail standards. Average speeds within this section will increase modestly from 53 to 55 mph (85 to 89 km/h). Achieving higher speeds elsewhere will require more extensive investment. The FRA requires speeds greater than 110 mph (177 km/h) to be grade separated. Each host rail carrier has different speed criteria for grade separation, often at lower speeds than the FRA. Therefore, it is likely that a separate, dedicated high-speed passenger rail track and significant new alignment would need to be constructed.

Washington's current long-range plan and Oregon's draft goals call for the following expansions of service:

- **Eugene to Portland:** Six daily round-trips; travel time of 2 hours
- **Portland to Seattle:** Thirteen daily round-trips; travel time of 2 hours, 30 minutes
- **Seattle to Vancouver, B.C.:** Four daily round-trips; travel time of 2 hours, 37 minutes

With the implementation of these long-range plans, following are the top and average speeds that would be achieved in the various segments of the corridor:

- **Eugene to Portland:** Average speed of 65 mph (105 km/h) and top speed of 110 mph



- **Portland to Seattle:** Average speed of 74 mph (119 km/h) and top speed of 110 mph
- **Seattle to Vancouver, B.C.:** Average speed of 59 mph (95 km/h) and top speed of 110 mph

These improvements would allow for each of these segments of the corridor to modestly achieve High-Speed Rail regional standards.

This plan has an estimated cost of more than \$6.5 billion for Portland to Vancouver, B.C., and an estimated \$2 billion for Portland to Eugene. It is anticipated that these costs will increase each year due to higher construction costs and inflation.

6.3 Pacific Coast Corridors

The current focus of the four jurisdictions is to substantially improve rail service in the California Corridor (Sacramento to San Diego) and the Pacific Northwest Corridor (Eugene to Vancouver, B.C.). When the improvements identified in Section 6 have been completed, there will be a significant reduction in estimated travel time.

Vancouver, B.C. to Eugene segments:

Route	Current Travel Time	Future Travel Time	Travel Time Savings
Vancouver – Seattle	4 hours	2 hours, 37 minutes	1 hour, 23 minutes
Seattle – Portland	3 hours, 30 minutes	2 hours, 30 minutes	1 hour
Portland – Eugene	2 hours, 35 minutes	2 hours	35 minutes
Total	10 hours, 5 minutes	7 hours, 7 minutes	2 hours, 58 minutes

Sacramento to San Diego segments:

Route	Current Travel Time	Future Travel Time	Travel Time Savings
Sacramento – Los Angeles	14 hours, 25 minutes	2 hours, 17 minutes	12 hours, 8 minutes
Los Angeles – San Diego	2 hours, 40 minutes	1 hour, 18 minutes	1 hour, 22 minutes
Total	17 hours, 5 minutes	3 hours, 35 minutes	13 hours, 30 minutes

7.0 Currently Planned Service Compared Pacific Coast Collaborative Vision of High-Speed Rail



Defining next steps in part depends upon which of the three FRA definitions for high-speed rail is used. If the Emerging High-Speed Rail definition is used (top speeds of 90–110 mph), then relatively few service gaps would result compared to the gaps that would result with High-Speed Rail Regional (top speeds of 110–150 mph) or High-Speed Rail Express (top speeds of at least 150 mph). However, when assessing service gaps, it is important to look at not only top speeds but also average speeds within the segments of the corridor.

7.1 California Corridor

Within the California Corridor, there are no anticipated service gaps between the overall Pacific Coast Collaborative vision for high-speed rail and what is now planned in California. California's planned high-speed rail routes will run at top speeds of up to 220 mph and average speeds above 150 mph, primarily along exclusive track. These speeds meet the definition of High-Speed Rail Express.

The California Corridor requires significant additional funding to complete the proposed High-Speed Rail Express as well as the connecting Emerging High-Speed Rail corridors. The current funding commitment of approximately \$12 billion is \$24 billion short of the estimated cost to construct the first phase (San Francisco to Anaheim) of the High-Speed Express project.

7.2 Pacific Northwest Corridor

Within the Pacific Northwest Corridor, significant gaps would remain between the current long-term plans for rail service and High-Speed Rail Express (at least 150 mph/240 km/h) or the mid- to upper speeds of High-Speed Rail Regional (110–150 mph/177–240 km/h). Plans for expansion of the Pacific Northwest Rail Corridor were produced by Washington and Oregon before knowledge of U.S. federal stimulus funding or a federal high-speed rail program. As such, additional studies are needed to develop the service to top speeds greater than 110 mph (177 km/h) and greater than the average speed of 66 mph (106 km/h) that would be obtained under the current long-range plan.

7.3 Service Between Sacramento, California and Eugene, Oregon

The Pacific Coast Collaborative Action Plan poses the question of whether the high-speed rail vision could potentially be expanded to include high-speed rail services operating from California to British Columbia. Presently, California, Oregon and Amtrak do not have plans to significantly enhance passenger rail service between Sacramento and Eugene due to sparse population and mountainous terrain. Oregon recently completed



a study on improvements to passenger rail service on an existing freight alignment between Eugene and Ashland, just north of the California border. The study concluded service between Eugene and Ashland was not feasible at this time due to the mountainous terrain that restricts running times and to estimates of low ridership. If additional studies of service between Sacramento and Eugene are pursued, they could consider interface with other forms of transportation. For example, Caltrans might re-evaluate the feasibility of a Sacramento – Redding passenger rail corridor as a first step in improving service between California and Oregon. Rail service could also interface with express bus service.

8.0 High-Speed Rail – Considerations

A number of considerations need to be weighed when determining what high-speed rail would look like in the various segments along the Pacific Coast, and when investments should take place. Considerations include cost, funding/investment availability, population, size of travel markets, passenger rail demand and acceptability of mode, geographic constraints, and available rail corridors and infrastructure (sharing track with freight).

8.1 Cost

Cost is a significant consideration when determining when to construct an infrastructure project, including high-speed rail that requires substantial investment. The costs of high-speed rail in various segments throughout the Pacific Coast will vary widely for a number of reasons, including surrounding population density, topography and level of speeds that require varying lengths of high-speed class track.

The first phase of California's High-Speed Rail Express project, a 456 mile (734 km) segment from Orange County (Anaheim) to San Francisco, has an estimated construction cost of \$36 billion. The Pacific Northwest Corridor is similar in length at 466 miles (750 km). However, the segments' topography and population densities are substantially different, and so cost estimates will vary.

As noted in Section 6, the current focus of the four jurisdictions is to substantially improve rail service in the California Corridor (Sacramento to San Diego) and the Pacific Northwest Corridor (Eugene to Vancouver, B.C.). As with all high-speed rail feasibility studies, plans for the 514 mile (827 km) segment between Sacramento and Eugene will need to take into account the comparative advantages of different modes of transportation, as further discussed in this paper. The FRA Rail Plan completed in September 2010 compares the potential market advantage of various passenger transportation modes. As with other high-speed rail corridors, interface with commercial airports, transit and the highway network should be considered.

It is also important to assess high-speed rail costs relative to the cost of maintaining, expanding or reducing investments in other modes of transportation. In addition, the costs and savings of achieving other public policy objectives, such as promoting employment, technology and innovation, energy conservation, and reduction of carbon and other emissions, should be evaluated.

8.2 Funding / Investment

High-speed rail requires a substantial investment. Given the substantive costs and the range of beneficiaries, implementing high-speed rail will entail significant funding commitments from key levels of governments and the private sector.



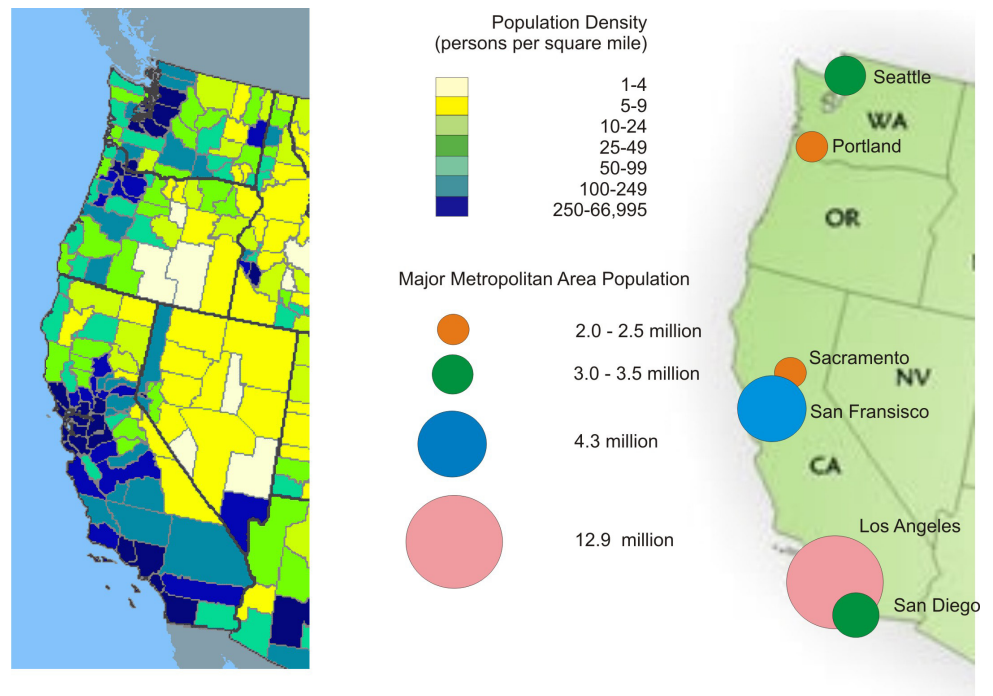


8.3 Population / Travel Market

The size of a region’s population and associated travel markets should correspond with any proposed investment. Similar to other forms of mass transit, travel by rail becomes more competitive in areas of higher population growth and density, or when gasoline is expensive, as conventional trains are more fuel efficient than cars when ridership is high. The intercity travel markets along the Pacific Coast are a function of population growth and density of both origin and destination communities. California has the largest travel market while Oregon has the lowest. Washington and the Lower Mainland of British Columbia have slightly larger travel markets than Oregon. The Lower Mainland of British Columbia has similar densities and population to those of Seattle and Portland. The figure below illustrates the population growth and densities in the corridors.

California’s vision for High-Speed Express Rail runs from Sacramento and San Francisco to Los Angeles and on to San Diego. Approximately 19.8 million people reside within those four urban areas. Additional stations on the route between the Los Angeles and San Francisco urban areas serve a population of 2.6 million (including adjacent urban areas), which brings the total population to be served on the Corridor to 22.4 million.

In comparison, within the Pacific Northwest Corridor, the three largest travel markets of Portland, Seattle and Vancouver, B.C., are estimated to encompass approximately 7 million to 8 million people. Further study is required to determine the population that would be served by a High-Speed Rail Express system within the Pacific Northwest Corridor. This study would need to determine where alignments and stops might be located, thereby identifying those communities that would be directly served by High-Speed Rail Express.



8.4 Passenger Rail Demand/ Acceptability of Mode

Another key consideration when determining level of investment is the passenger rail demand within a corridor. Annual ridership on major Amtrak lines along the Pacific Coast provide an indication of the initial size of the rail market in various portions of the region.

California (Federal Fiscal Year 2010)

Capital Corridor (San Jose – Sacramento)	1,581,000
San Joaquin (Bakersfield – Oakland)	978,000
Pacific Surfliner (San Luis Obispo – San Diego)	2,614,000
TOTAL	5,173,000

California – Washington

Coast Starlight (Los Angeles – Seattle)	444,000
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British Columbia – Oregon

Cascade (Vancouver, B.C. – Eugene)	836,000
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Building a steady and sustainable level of ridership requires some travellers to change their mode of travel. To increase the rail modal shift for trips longer than 150 miles (240 km), there would need to be a significant shift from air transportation.

8.5 Geographical, Topographical and Urban Development Considerations

Geographical and topographical considerations can play a significant role in determining the final cost, speed and alignment of a rail route. In mountainous terrain, options usually include either diverting the alignment around the mountains (which often costs less but adds significant travel time), or tunnelling through the mountain (which adds substantial costs to a project but reduces travel time on the route).

Urban development provides key opportunities for rail travel. At the same time, building infrastructure through dense populations requires integration in urban land use and often makes right-of-ways more expensive.

8.6 Available Rail Corridors and Infrastructure

Amtrak service along the Pacific Coast now operates on track that is shared with freight trains, with extensive portions of service operating near urbanized areas and through and around mountain ranges. Reaching speeds from Sacramento to Eugene similar to speeds envisioned in the Pacific Northwest and California corridors would require significant investment in new track built to High-Speed Rail Express standards.





9.0 Conclusions and Recommended Next Steps

Significant efforts and hundreds of millions of dollars of investments have been made in the California and Pacific Northwest Rail corridors over the past 20 years. These investments have enabled rail passenger traffic to grow significantly within and between the corridors. They lay the foundation for even more significant rail investments in the future. The Pacific Coast Collaborative vision for high-speed rail builds on this foundation.

9.1 Next Steps

The Pacific Coast Collaborative Action Plan poses the question of whether the vision could potentially be expanded to include high-speed rail services fully operating from California to British Columbia. Presently, California, Oregon and Amtrak do not have plans to significantly enhance passenger rail service between Sacramento and Eugene due to sparse population and mountainous terrain. The currently planned improvements in the California and Pacific Northwest Corridors will significantly reduce estimated travel time between San Diego and Vancouver, B.C. This study recommends that the jurisdictions focus on further enhancing these viable Corridors.

9.1.1 California Corridor

In California, the High-Speed Rail Authority will proceed with engineering to begin construction on the first segment of its Phase 1 plans by 2012. The High-Speed Rail Authority will also continue to seek private, federal, state and local funds to complete additional segments of Phase 1, with a goal of completion of the Anaheim to San Francisco Phase by 2020. Caltrans will continue to improve and invest in its three-state intercity corridors with a goal of improving intercity service, meeting the standards for Emerging High-Speed Rail and preparing to act as a major feeder to the California High-Speed Rail Express system at several key stations. Caltrans will continue to seek state and federal funds for additional equipment and infrastructure improvement. Caltrans may re-evaluate the feasibility of a Sacramento to Redding passenger rail corridor as a first step in improving service between California and Oregon.

9.1.2 Northwest Corridor

Oregon, Washington and British Columbia will continue to invest in the Pacific Northwest Corridor and will continue to seek respective federal funds for the Corridor. Oregon and Washington will implement the rail improvements funded through the High-Speed Intercity Passenger Rail program, and British Columbia will continue to implement the removal of a number of at-grade rail crossings as part of the South Fraser Perimeter Road project.

Continued collaboration among the jurisdictions is key to the Pacific Coast Collaborative vision of high-speed rail. A next step in advancing this vision is a joint report that links British Columbia's rail improvements, Washington's mid and long-range rail plans that include service to Vancouver, B.C., and Oregon's planned Environmental Impact Statement on service from Portland to Eugene. This report would address the issues identified in this paper to further enhance service in the Pacific Northwest Corridor.