

California State Rail Plan

Connecting California



Building California's Future

California is the world's fifth-largest economy, and home to nearly 40 million people. California supports world-class cities, universities, research centers, and the world's most valuable, innovative, and technologically advanced companies. The state's landscapes include productive agricultural areas and spectacular natural beauty—from the shoreline to the mountains to the deserts. This natural beauty, alongside thriving communities, draws visitors and residents alike to support the state's innovative economy, spur its entrepreneurial spirit, and sustain its creative culture.

To continue to compete and thrive on the cutting edge of global technology, to lead the state's efforts to curb climate change, and to grow sustainably and resiliently in a fast-changing world, **Californians must invest in and build a high-performance statewide rail system befitting their needs and ambitions.**





Recent events have added significant new momentum that will lead to a renaissance of rail transportation throughout the state. At the local level, many counties have passed sales tax measures that add tremendous resources to the development of passenger rail—most notably in Los Angeles, Santa Clara, and Alameda Counties. At the State level, new revenue sources provide the long-term resources to invest in the state’s transportation system. We have the opportunity to grow service in congested corridors, launch new rail services and extensions, develop customer-friendly connections, provide statewide integrated ticketing and trip planning, reduce delays and travel times, and attract new riders to the statewide rail network. This is an opportunity to transform how we travel throughout the state.

By 2040, Californians will have access to an integrated, state-of-the-art rail system that will revolutionize personal mobility and enhance quality of life. Passenger rail will be the option of choice for a large share of regional and long-distance travel in the state. It will help Californians achieve greenhouse gas (GHG) and air quality goals while boosting economic growth and helping to create more livable communities. Passenger rail trips are expected to increase more than tenfold, to more than **1.3 million per day**, while total mode shift to rail and transit increases twenty-fold over the current share.

California’s rail system will expand its ability to move freight cleanly and efficiently, benefiting Californians and California’s businesses, as well as supporting national competitiveness. Freight rail capacity will significantly increase to handle a **more than doubling of demand**, almost entirely within existing rail corridor rights-of-way. Federal, state, and local agencies will partner with privately owned freight railroads to support this growth.

California State Rail Plan Overview

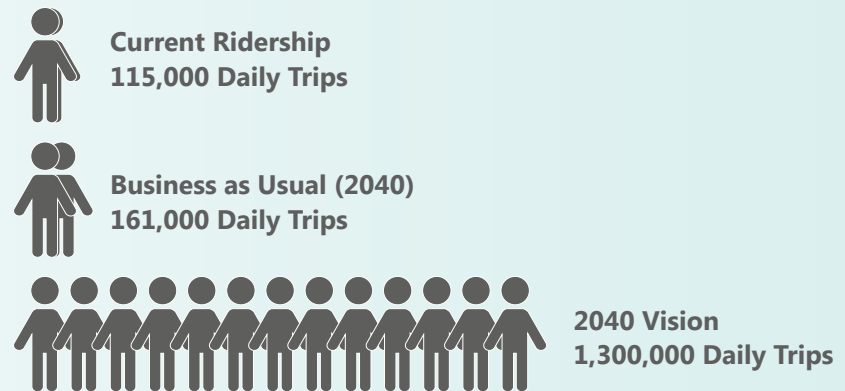
The 2018 California State Rail Plan (Rail Plan) is a strategic plan with operating and capital investment strategies that will lead to a coordinated, statewide travel system. The Rail Plan is an important element in the **comprehensive planning and analysis of statewide transportation investment strategies detailed in the California Transportation Plan 2040 (CTP 2040)**. In concert with CTP 2040 and other plans, the Rail Plan will help clear the air, invigorate our cities, and provide the mobility that Californians will need in the future. Regional plans will build on the Rail Plan as they make use of new regional rail capacity, develop transit networks, and set land use recommendations that benefit from enhanced connectivity. Federal and state grant awards and funding decisions will consider project alignment with the 2040 Passenger Rail Vision (2040 Vision) and strategies reflected in the Rail Plan.

This Rail Plan is more ambitious than previous rail plans. In compliance with federal and state laws, it proposes a unified statewide rail network that better integrates passenger and freight service, connects passenger rail to other transportation modes, and supports smart mobility. The Rail Plan acknowledges the need for expanded freight capacity to support future economic needs.

The Rail Plan aims to capture an increasing percentage of travel demand by rail. California's population will be 47 million by 2040, a 25 percent increase from 2010. Jobs are expected to grow at similar rates, with a 31 percent increase by 2040.

California has already built the best statewide rail and bus system in the country—the result of concentrated efforts starting in the 1990s. Intercity and regional ridership is booming, with services that didn't even exist 25 years ago now playing a vital role throughout the state. Current intercity and regional rail ridership exceeds 115,000 per day, with additional ridership on transit services that connect to the rail network.¹

The rail system has the potential latent capacity to provide more service, with more efficient performance. With longer trains, more frequent services, better connectivity, and greater ease of access, the number of riders will grow, reducing average costs per passenger. More trains, running more often and with faster travel times, will be automobile- and air competitive, motivating travelers to use rail and transit for more daily trips. The user-friendly, high-performance statewide system described in the 2040 Vision will carry more than 1.3 million daily trips by 2040. It will do so at a lower cost, allowing fares that encourage additional ridership and reduced public subsidies.



¹ For full ridership numbers, see Section 2.1.1 in the Rail Plan.

A great deal of implementation planning by State and local agencies, in partnership with each other, will be guided by the vision and strategies in the Rail Plan. Although clear investment priorities are indicated between now and 2040, the exact nature of the specific capital investments needed, as well as the phasing of network improvements, requires further input from local communities, current and future rail system users, and businesses, to ensure that impacts of network development are acceptable, costs are justifiable, and benefits are widespread.

The Rail Plan was developed by the California Department of Transportation (Caltrans) with extensive input from stakeholders and public outreach. The final plan is approved by the California State Transportation Agency (CalSTA), and will be reviewed and accepted by the Federal Railroad Administration (FRA). Caltrans also receives advice from the California Transportation Commission (CTC), and will submit the final approved Rail Plan to the Legislature, the Governor, the California Public Utilities Commission (CPUC), the California High-Speed Rail Authority (CHSRA), and the CTC.



California's Vision for an Integrated Statewide Rail Network

The integrated passenger rail system described in the **2040 Vision** comprises high-speed, intercity, and regional train services connecting at hubs to enable smooth transfers between trains, express buses, local transit, and even ferry boats. To facilitate efficient service and market-driven growth, the rail system can continue to expand capacity, largely on existing rights-of-way, while being sensitive to existing communities. The 2040 Vision will extend the significant benefits of high-speed rail (HSR) and multimodal connectivity to residents across the state.

The 2040 Vision will allow people to:

Travel seamlessly across urban, suburban, and rural areas of the state with **more trains, more often**: Departures at least every hour – and every 30 minutes or more frequently in most markets²;

Save time with significantly **faster trips**;

Enjoy the journey on **modern, safe, clean, and comfortable trains**;

Glide past traffic congestion on reliable trains and express buses in dedicated lanes;

Transfer quickly and easily between high-speed, intercity, and regional trains, express buses, and transit at hub stations with coordinated arrivals and departures with significantly reduced wait times;

And plan entire door-to-door trips, and purchase a **single ticket** using a streamlined trip-planning portal.

² Some low-density areas of the state may have bi-hourly or every-4-hour service until the market matures.



As freight rail capacity grows and freight operations benefit from fewer delays from passenger train movements, shippers will benefit as well from more reliable and environmentally friendly shipping options. Coordinated planning and investments among public agencies and private railroads will ensure that freight rail operators will benefit from the strategies in this plan.

Coordinated and ongoing planning allows State and regional agencies responsible for rail services to have a conversation with communities about how best to meet diverse needs. Investing in rail will increase the mode share of freight and passenger rail, and will support a growing economy while lowering statewide transportation costs, integrating rail travel network with existing state highways and airports, improving safety, lowering GHG emissions, and enhancing livability. Highways and local roads will benefit from having their capacity used for high-value trips that cannot be made by rail, and airports will benefit from having their capacity available for higher-profit long-distance flights. Locally, California cities and towns will benefit from the private investment that follows station-area development.

“California has a premier, customer-focused, integrated rail system that successfully moves people and products while enhancing growth and quality of life.”



The 2040 Vision for passenger rail introduces new services and expands the state's rail network into new areas of California and across state borders, including the congested international border into Mexico.

The passenger component of the 2040 Vision includes several key elements:

Statewide System – Passenger rail service will tie together urban, suburban, and rural areas of the state.

Integrated Services – Multimodal hubs will connect all levels of service with a common fare system, which allows trips to be made on a single ticket.

Coordinated Schedules – Services will be coordinated in a "Pulsed" schedule across the network to reduce wait times and allow direct transfers.

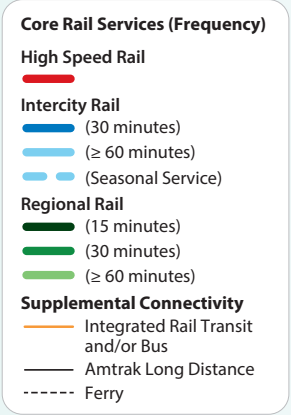
Frequent Service – Service frequency will make rail a timely option for travelers, meeting trip demands throughout the day.

Customer Focus – Enhanced ticketing, scheduling, and passenger information will be supported by coordinated services.

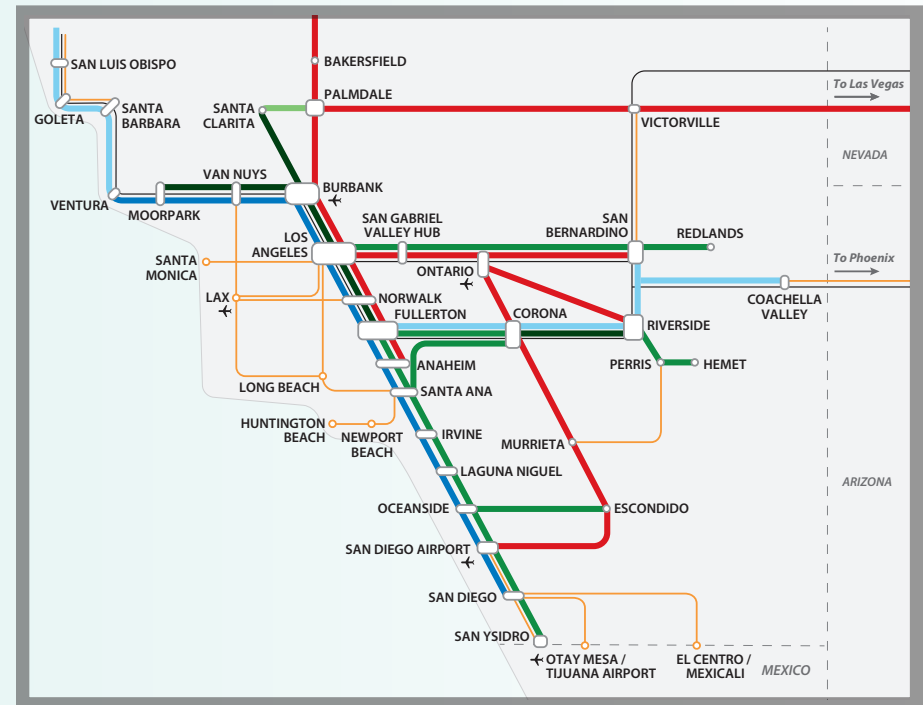
State Rail Plan Vision



2040 Integrated Network – Northern California



2040 Integrated Network – Southern California



Moving Goods and Enhancing the Economy

California is the fifth-largest economy in the world, with an annual gross domestic product of more than \$2.4 trillion. California businesses export roughly \$162 billion worth of goods to more than 225 foreign countries annually. The state's extensive rail network supports California's economy, while minimizing impacts on air quality compared to other modes. Rail is an efficient, safe, and cost-effective way to move goods, because energy consumption and GHG emissions per ton carried are far lower than with diesel trucks.

The ability of the state's freight railroads to deliver these benefits depends on fluid traffic conditions on the railroads' main lines. **By 2040, the state's freight railroad loads will have increased by 38 percent, compared to 2013.** Investments to address bottlenecks, improve operations, and increase capacity throughout the network will reduce congestion and delays. In turn, an improved freight rail network will help shift goods movement away from congested roadways, which have a limited ability to expand.

Improvements in California's rail system are investments that will pay off with greater economic activity: **new construction, more jobs, and growing tax revenues.** The goods movement industry creates valuable jobs at California's ports and intermodal transfer facilities, warehouses, and distribution centers. Investment in the rail system supports diverse industries by making California's businesses more efficient and competitive.





The Rail Plan **freight investment strategy** envisions an evolving partnership between the state, regions, and the freight railroads to:

Eliminate bottlenecks and use existing corridors more intensively, enhancing the capabilities of both freight and passenger trains in the short term;

Make use of significant new federal and state funding programs, such as Infrastructure for Rebuilding America (INFRA) and the Trade Corridor Enhancement Program (TCEP), to implement corridor investment programs for freight improvements;

Make shared investments that improve the performance and utility of freight and passenger operations through strategic identification of infrastructure projects that provide benefits to all operators, and

Implement quiet zones and grade separations, and foster the use of cleaner and quieter locomotives that will make railroads better neighbors.

Direct Economic Benefits

*463,000 full time jobs
\$28 billion in labor income*

*\$77.5 billion in new state
economic output by 2040*



Steere Davies Gleave, 2018 State Rail Plan Analysis, Appendix A.6

The Rail Plan identifies \$40.8 billion of direct expenditures planned by private railroads and regional agencies, resulting in total economic output of nearly \$77.5 billion by 2040—a payout of nearly two dollars for every dollar invested. The expenditures will result in nearly 463,000 full-time jobs, and labor income surpassing \$28 billion across industries. By 2040, state and local tax revenues anticipated from the expenditures will be close to \$2 billion, and federal tax revenues will be \$5.4 billion. New federal and state trade corridor funding will accelerate many of these investments, bringing the economic benefits sooner. In addition to these planned expenditures, many of the projects that bring about passenger rail expansion will deliver significant capacity and operational benefits for freight rail as well.

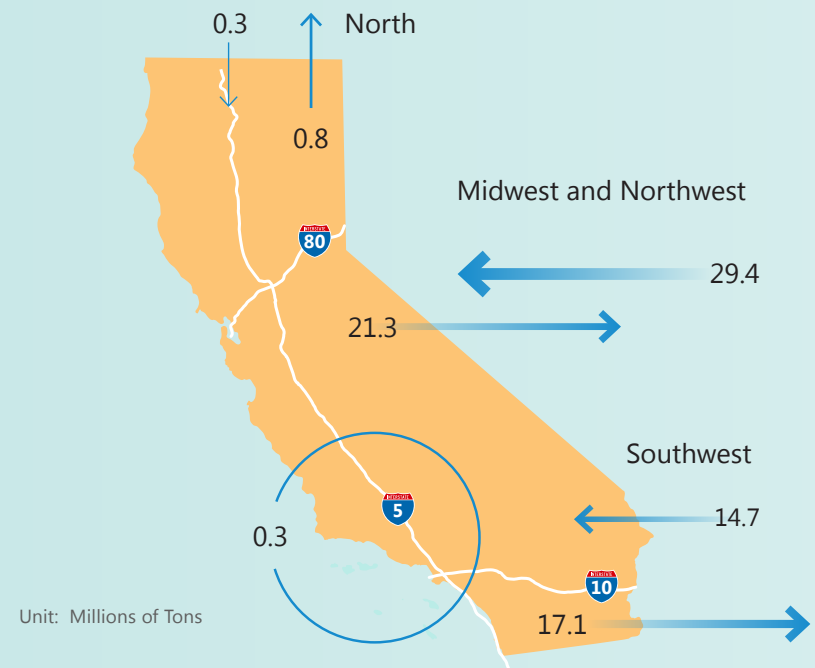
Ensuring Economic Competitiveness

The 2040 projections show significant intermodal growth from 2013—more than double the goods moving through the transcontinental routes. **Ensuring the state's economic competitiveness has been the guiding principle behind California's Trade Corridor Investment Fund program.** Strategic investments, such as the Colton Crossing grade separation, eliminated bottlenecks for Union Pacific Railroad and BNSF Railway traffic at the Ports of Los Angeles and Long Beach. The new Trade Corridor Enhancement Program (TCEP), will provide new opportunities to address strategic investments in highway and rail trade corridors, with additional funding of almost \$300 million annually for the coming decade and beyond.



Projected Intermodal Growth

2013





The freight component of the Rail Plan includes several key elements:

First, a **premier system** requires improved trade corridors, yards and terminals, upgraded track conditions for short lines, and innovative service concepts that have efficiency and safety benefits for all users.

Second, a **customer-focused** system will lead to improved access to the rail network (Class I and short lines), with competitive cost and service (improved speeds and service options), enhancing options for the state's shippers.

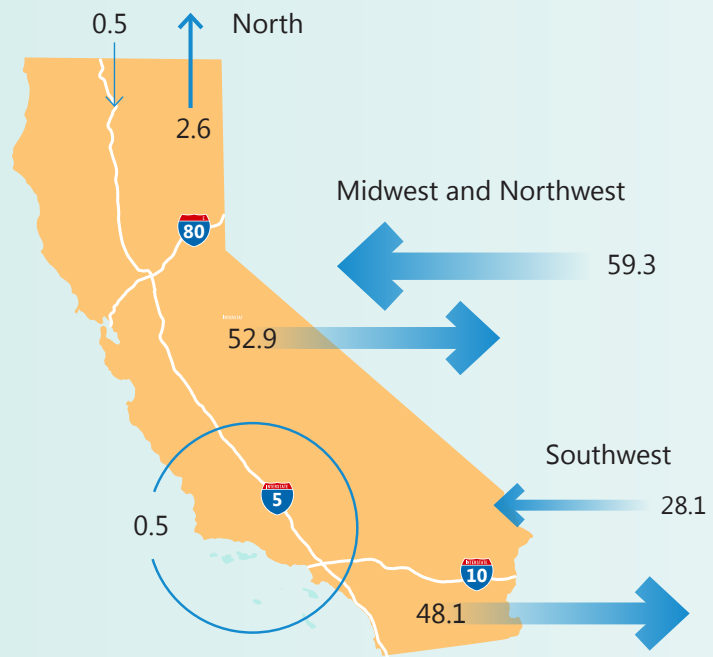
Third, an **integrated system** requires improved intermodal terminal and transload connections to smooth transfers between modes.

Fourth, the Rail Plan is focused on supporting development of a rail network that moves both **people and products**, and on addressing strategies and improvements for coordinating passenger and freight service and preserving freight capacity as passenger services grow.

Fifth, **economic growth** will be achieved through trade corridor improvements and the availability of competitive modal options for California's industries.

Finally, the Rail Plan supports improvements in California's **quality of life** through modal energy/emissions benefits associated with movement of freight by rail and mode-shift to rail where feasible. The Rail Plan also addresses grade-crossing impacts.

2040



Shifting from Highway to Railway

The 2040 Vision improvements make it possible for people to drive less. Reducing automobile passenger trips and vehicle miles traveled (VMT) reduces roadway congestion, GHG, and vehicle emissions, and supports the State's Assembly Bill 32 Scoping Plan target of an 80 percent reduction of GHG emissions from 1990 levels by 2050.

Rail Mode Share

Current: 0.34%



2040 No Build: 0.52%



2040 Vision: 6.8%



Rail ridership alone will increase more than 10-fold as part of the Rail Plan Vision, with passenger miles growing more than 20-fold due to longer average journeys compared to today. Many of the rail journeys will connect to California's growing transit systems as part of the beginning and/or end of the trip, providing additional ridership that will contribute to Caltrans' goal of doubling transit trips. Therefore, the integrated rail and transit network in California is expected to achieve a world-class 15%-20% share of all passenger miles in California by 2040, up from around 6% currently.

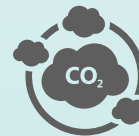
The 2040 Vision projects 88 million daily passenger miles diverted to rail from highways, and an increase of 92 million daily passenger miles on rail as a result of the investments outlined in the Rail Plan.

A reduction of that volume would:

Eliminate more than 13 million metric tons of carbon dioxide equivalence annually,³ comparable to planting more than 166 million urban trees every year; and

Decrease highway congestion, resulting in fewer hours lost commuting, less damage to roads, and more efficient travel of goods and people.

Compared to air travel, the projected 1.3 million rail riders per day is three times the number of passengers boarding flights at California's seven largest airports (LAX, SFO, SAN, OAK, SNA, SJC, and SMF)⁴. It would take nearly 3,000 Boeing 747 Jumbo Jets to carry the same number of daily passengers.



Reduce greenhouse gas emissions



Mitigate roadway congestion



Reduce vehicle emissions

³ U.S. Environmental Protection Agency Greenhouse Gases Equivalences Calculator.

⁴ United States Department of Transportation, Bureau of Transportation Statistics, Table 1-44, Passengers Boarded at the Top 50 U.S. Airports.

Advancing Sustainability and Livability

The Rail Plan advances the state's commitment to reduce GHG and other pollutants by providing a competitive alternative to private vehicle travel and diesel-truck transport. California HSR will be fully electrified, and powered by 100 percent renewable energy. Many intercity, regional, and urban transit passenger services will benefit from electrification or other zero-emission technology, often through sharing infrastructure with the growing HSR network.

By 2040, more than half of passenger trips and the majority of passenger miles of travel will take place on electrified trains in California. Diesel-electric and other alternative clean technology passenger and freight locomotives will reduce GHG emissions, making rail a greener mode of transportation.



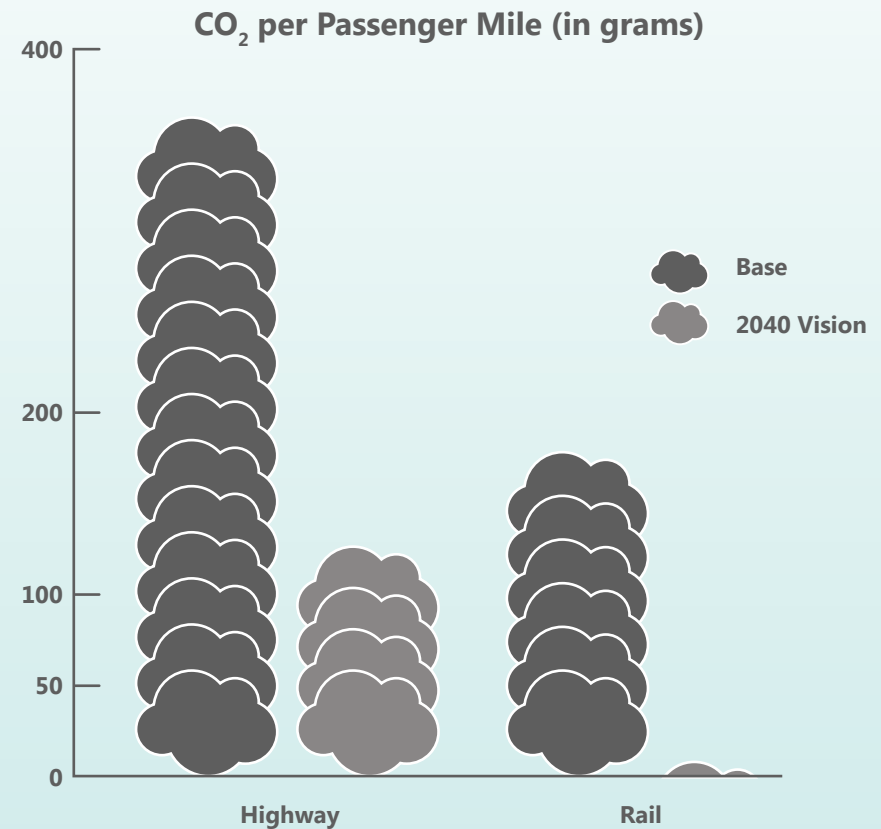
Offer a convenient and reliable alternative to private vehicle travel



Increase electric and zero-emission trains



Provide an alternative to truck transport of containerized cargo



Improving Safety

Emerging technologies offer opportunities to increase the safety and capacity of passenger and freight rail. Positive Train Control is capable of preventing train-to-train collisions, monitoring train speed, and stopping a train in an emergency. New technology can improve train operations in environmentally sensitive or dense urban areas to further reduce potential accidents.

Passenger rail is considered a far safer mode of travel; the risk of personal injuries and deaths in rail travel is currently 17 times lower than traveling by automobile, and even lower on high-speed trains. An anticipated reduction of 74 million daily VMT away from highways can potentially eliminate 250 fatalities and 19,000 transportation-related injuries in California by 2040, supporting the State's goal of adopting a "Toward Zero Deaths" practice, in coordination with local Vision Zero programs.

The most dangerous element of the rail network is grade crossings. Combined with new funding sources, such as the federal Fixing America's Surface Transportation (FAST) Act and state TCEP, federal railroad crossing safety programs and Caltrans-administered State programs, including the Section 130 Railroad/Highway At-Grade Crossing Improvement and the Section 190 Grade Separation programs, will continue to upgrade safety devices or eliminate rail/highway grade crossings throughout the state.

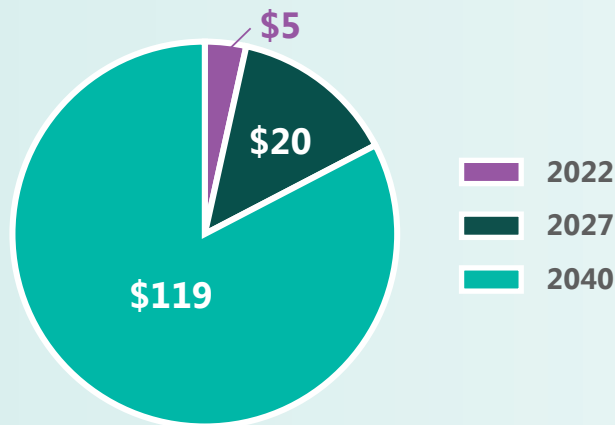


Funding Opportunities: Sources and Programs

Rail funding in California is a unique partnership among federal, State, regional, and private sources. These sources continue to grow and will provide significant enhancement of the funding available to State and regional agencies responsible for many of the rail services. Future improvements in intercity and regional services will allow operating revenues to provide significant resources to invest in rail corridor improvements.

2040 Vision

Overall Capital Program (in Billions) Time Horizon⁵



⁵ Estimated costs in 2018 dollars. These costs are planning-level estimates and require further study in implementation

Key rail funding sources and programs include:

- **Local Transportation Fund**
- **Local Sales Tax**
- **Caltrans Intercity Rail Operations Support Program**
- **State Transportation Improvement Program**
- **Transit and Intercity Rail Capital Program**
- **State Transit Assistance**
- **State Rail Assistance**
- **Solutions for Congested Corridors Program**
- **Trade Corridors Enhancement Program**
- **Federal Discretionary Programs**
 - » TIGER/BUILD
 - » FASTLANE/INFRA
 - » FTA's Capital Investment Grants
 - » FRA's FAST Act grants
 - » CRISI
- **Federal Transit Formula Programs**
- **High Speed Rail Funding**
- **Surplus Operating Revenues**

Implementation Goals: A Phased Approach

To achieve the 2040 Vision, the Rail Plan identifies phased investments to reach frequency and connectivity goals.

Strategic implementation plans, most developed between now and 2022, will guide investments and implementation planning, to avoid redundancy and deliver enhancements sooner.

Statewide Service Highlights

2022

The statewide plan for 2022 or earlier identifies service improvements that will lay the foundation for improving and integrating the passenger rail network. Advancing projects allow expansion of service, including Caltrain electrification; expansion of rail service to Redlands, Salinas, and Larkspur; and increased frequencies on segments of intercity and regional rail corridors. These efforts include programmed funding, or funding expected to be awarded in 2018, and identified capacity in host railroad agreements.

Additional efforts include:

- Assisting communities statewide in better connecting transit systems to rail, and enhancing station area functions;
- Land use planning and development to cluster jobs and housing at station hubs;
- Strategic planning for fleet management, replacement, and expansion; and
- Conducting targeted investments in integrated ticketing and travel planning.



2027

The 2027 or earlier service goals focus on initial HSR services, targeted improvements for integrating intercity and regional rail with initial HSR, and maximizing service in existing rail corridors. Key components of the 2027 plan include beginning HSR service on initial segments and expansion of rail services to Merced, Coachella Valley, and Las Vegas; with significant growth in intercity and regional rail frequencies on all existing corridors, including the Central Coast.

Additional efforts include:

- Initiation of statewide pulse-hub operations;
- Full use of programmed passenger corridor capacity statewide;
- Full use of negotiated passenger service capacity on existing freight corridors;
- Targeted investments at hubs;
- Fully developed and operational integrated ticketing; and
- Implementation of a new fleet strategy.

2040

The 2040 or earlier Vision represents the full build-out of the long-term planning goals for the integrated statewide rail network.

The 2040 Vision highlights include:

- HSR expanded and integrated service to Sacramento, the Inland Empire, and San Diego;
- Completion of the San Francisco Downtown Extension and a new Transbay tube, allowing fast service between Sacramento, San Francisco, and throughout the Bay Area;
- Completion of many complementary corridor investments in the Los Angeles Basin;
- Significant new regional services in the Central Valley, on the Central Coast, and in the North Bay;
- Expansion of network capacity in full realization of the integrated service goals; and
- Intensification of services, with more frequencies and higher speeds, implemented during the 2022 and 2027 horizon years.

Statewide Rail Stakeholders

We would like to thank the following agencies and consultants:

California State Transportation Agency

Brian Annis, Secretary
Christine Inouye, Undersecretary
Chad Edison, Deputy Secretary for Transportation
Ben De Alba, Former Assistant Secretary for Rail and Ports
Kate White, Deputy Secretary for Environmental Policy and Housing Coordination
Brian Kelly, former Secretary and current CHSR CEO

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State and Federal Agency Partners

CalSTA
California Air Resources Board
California Freight Advisory Committee
CHSRA
CPUC
CTC
FRA
Governor's Office of Business and Economic Development (GoBiz)
National Railroad Passenger Corporation/Amtrak
State of Arizona Department of Transportation
State of Nevada Department of Transportation

Intercity Passenger Rail and Rail Transit

Bay Area Rapid Transit/BART
Capitol Corridor Joint Powers Authority/Northern California Rail Partners
Los Angeles – San Diego – San Luis Obispo Rail Corridor Agency Joint Powers Authority
Los Angeles County Metropolitan Transportation Authority
North County Transit District
Peninsula Corridor Joint Powers Board/Caltrain
Sacramento Regional Transit/SacRT
San Diego Metropolitan Transit System
San Francisco Municipal Transportation Agency/MUNI
San Joaquin Joint Powers Authority/Altamont Corridor Express
Sonoma Marin Area Regional Transit
Southern California Regional Rail Authority/Metrolink
Valley Transportation Authority
XpressWest

Regional Planning Agencies

California Association of Councils of Governments
Metropolitan Transportation Commission
Placer County Transportation Planning Agency
San Benito Council of Governments
San Bernardino Association of Governments
San Diego Association of Governments
San Francisco County Transportation Authority
San Joaquin Valley Regional Policy Council
San Luis Obispo Council of Governments
Santa Barbara County Association of Governments
Santa Cruz County Regional Transportation Commission
Sacramento Area Council of Governments
Southern California Association of Governments
Riverside County Transportation Commission
Transportation Agency for Monterey County

Freight Rail

California Shortline Railroad Association
California Association of Port Authorities/California Airports Council
BNSF Railway
Genesee & Wyoming Inc.
Pacific Merchants Shipping Association
Union Pacific Railroad

Advocates

California Transit Association
California Farm Bureau Federation
Local Government Commission
The Nature Conservancy

Tribal Representation

Native American Advisory Committee
Northern California Chairman's Association
Central California Chairman's Association
Southern California Chairman's Association





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