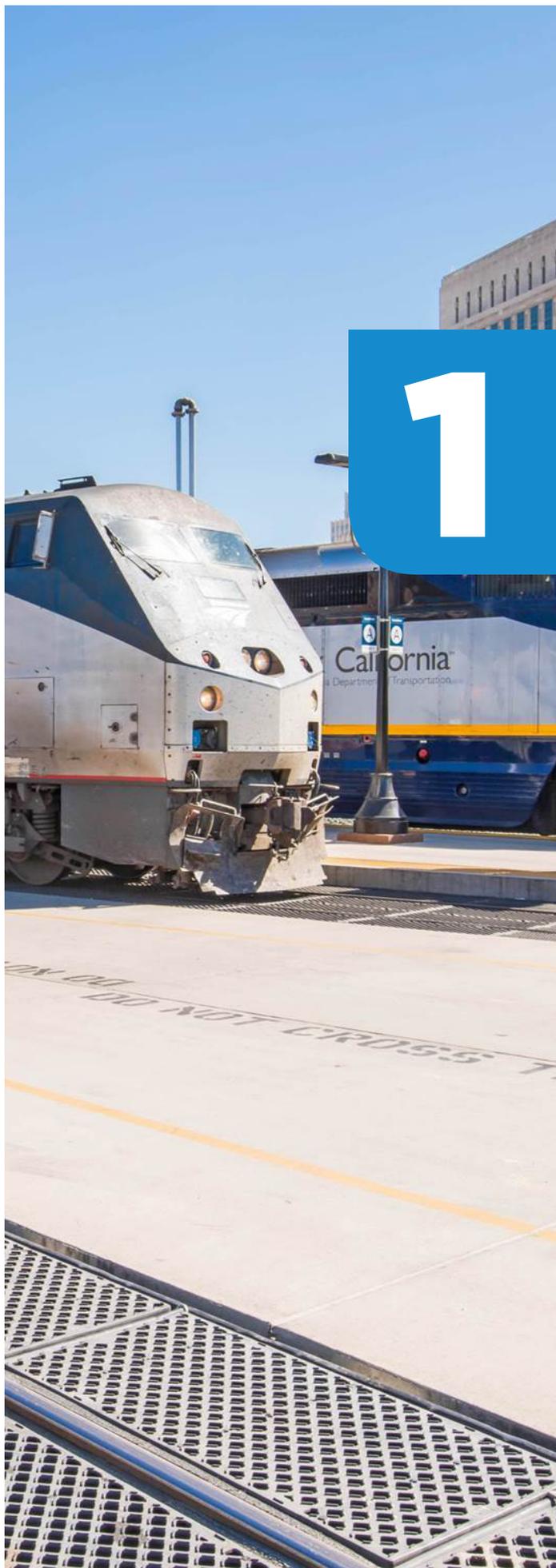


1

Role of Rail in Statewide Transport

Caltrans' mission in developing the California State Rail Plan is to provide a framework for a safe, sustainable, integrated, and efficient California rail network that successfully moves people and goods while enhancing the State's economy and livability.



1.1 2018 California State Rail Plan Overview

California is building the future every day.

California is the world's fifth-largest economy; is home to nearly 40 million people; and supports world-class cities, universities, and research centers, and the world's most valuable, innovative, and technologically advanced companies. The State's agricultural industry feeds the nation. Ports through which goods and products flow to and through the rest of the nation are a center of international trade. California's iconic parks and landscapes draw visitors from all over the world.

California can experience even greater success by efficiently connecting and updating the transportation system built on rail networks and highways from the 19th and 20th centuries. The status quo is not enough to support this growing economy and meet its robust economic and environmental future needs. Residents and workers in California's growing mega-regions face mounting vehicle congestion and crippling commute times due to pressures on the housing market and the aging transportation infrastructure.

This creates bottlenecks in the movement of goods, and in access to popular destinations and across California's borders. Quality of life is further impacted by transportation-related air pollution. The state's farms and forests are threatened by erratic patterns of drought and downpour, and by extreme weather generated by greenhouse gas (GHG) emissions and a changing climate.

California is uniquely poised to meet these challenges.

The State is a national leader in developing a passenger and freight rail network connecting its growing regions. Modern rail is the most cost- and energy-efficient transportation technology to quickly, safely, and affordably connect people to their destinations, and goods to their markets. Californians must continue to invest in and build an advanced, integrated statewide rail system befitting both their needs and their ambitions to continue to compete and thrive on the cutting edge of global technology; to lead in efforts to curb climate change; and to grow sustainably and resiliently in a fast-changing world.



1.2 State Rail Plan Purpose

The 2018 California State Rail Plan (Rail Plan) establishes a statewide vision of an integrated rail system that provides comprehensive and coordinated service to passengers through more frequent service, and convenient transfers between rail services and transit. This integrated system uses the existing rail system more efficiently; expands the coverage and mix of rail services in several key corridors; scales proposed services to meet anticipated market demand; and facilitates network-wide coordination through scheduled, or “pulsed,” transfers. For passengers, this integrated system means a faster, more convenient and reliable door-to-door travel experience. For freight movements, this integrated system means better system reliability and a clear pathway to growing capacity, which leads to economic benefits that reverberate locally, regionally, and nationally.

The California transportation network today:

- Total highway / roadway centerline miles: 175,818
- More than 13,133 State-owned bridges
- Twelve California seaports, including the nation’s largest port complex
- More than 300 airports (Commercial and General Aviation)
- One of the nation’s most extensive passenger and freight rail systems with more than 10,000 passenger and freight route miles

The Rail Plan anticipates exciting new developments in California’s rail system, and presents a future vision for statewide rail travel that builds on the State’s existing conventional rail, along with opportunities provided by high-speed rail (HSR) and transit; leverages emerging technologies such as electrification and advanced train control systems that help make rail travel more efficient, faster, safer, and more reliable; makes the existing system more cost-effective to operate; and channels savings to new capital projects and system enhancements. The Rail Plan assesses a changing funding landscape, including the influence of newly funded Senate Bill (SB) 1 transportation package and California’s Cap-and-Trade Program for reducing GHG emissions. The planned rail system envisioned in the Rail Plan will improve Californians’ quality of life by mitigating roadway congestion; reducing vehicle emissions; supporting compact land use; and offering convenient, reliable, and automobile-competitive alternative travel and goods movement. The Rail Plan also addresses issues of access (defined as the availability of opportunities within a certain distance), as well as mobility (the ability to move between activity sites).¹ A statewide rail system offers a viable alternative to driving for both local and long-distance trips for all populations, including those who lack access to or cannot afford automobiles, and for people who choose not to drive.

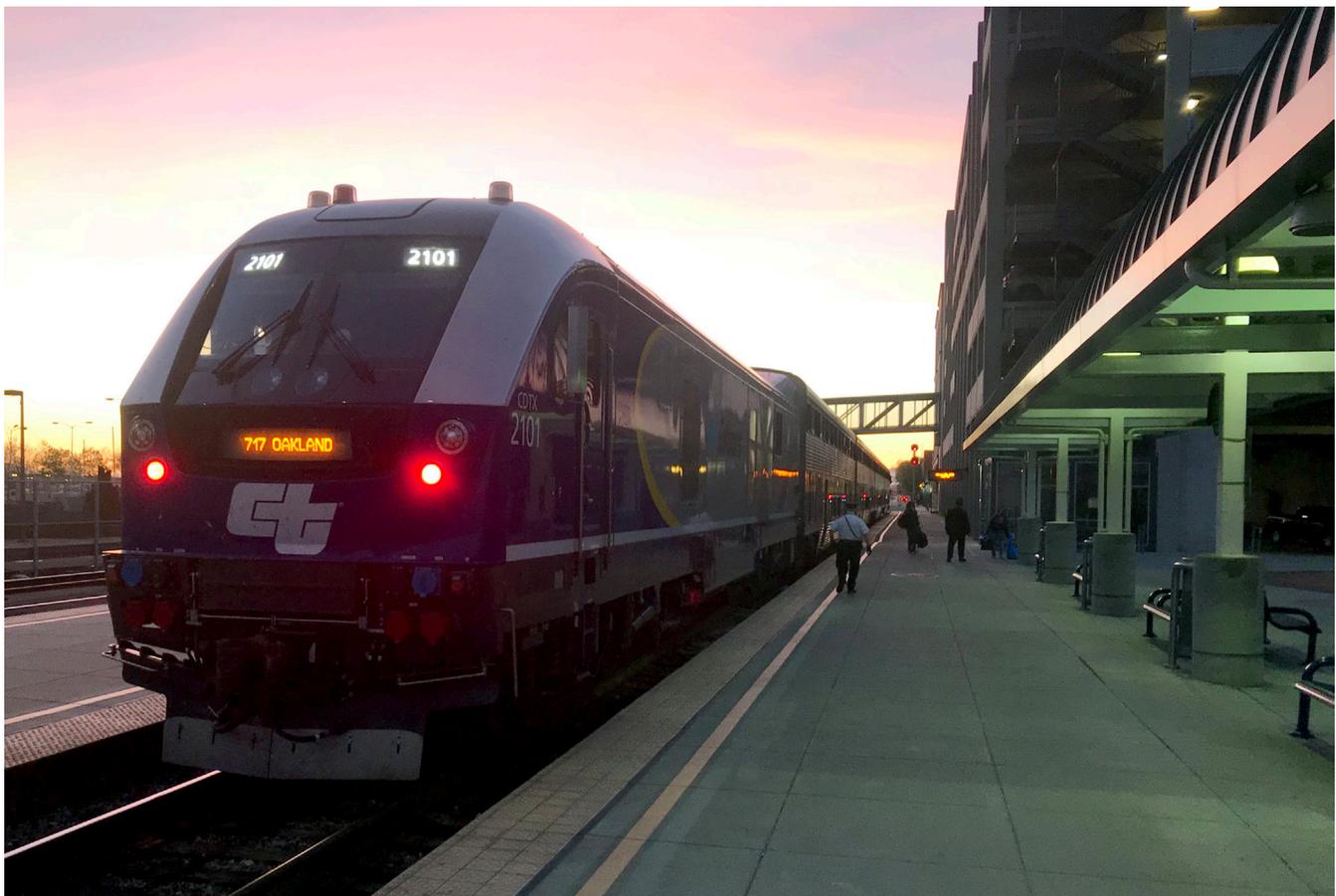
1 Hanson, Susan, *The Geography of Urban Transportation*, 2004, accessed 2016.

The Rail Plan vision includes a 2040 time horizon that is not financially constrained. The vision provides a technical framework for realizing the full potential of our existing rail network, and using available capacity on freight-heavy routes in a fully integrated statewide passenger service that draws on detailed input and guidance from key stakeholder initiatives and leadership. In partnership with those same stakeholders, this vision can be achieved in phases, with different levels of integration activated as improvements are delivered over time.

Phasing implementation prioritizes more intensive utilization of the existing infrastructure while minimizing duplicate or stranded investments. A mid-term 10-year capital program is derived from the 2040 Passenger Rail Vision (2040 Vision). This program builds on the already programmed short-term capital projects, and represents what the State reasonably expects can be funded by 2027.

However, these phases are meant to establish the thresholds that guide strategic planning and do not preclude projects in one time frame from funding in a nearer term time frame. The Rail Plan provides for incremental service planning and capital investment decision-making with an ultimate network vision in mind: it offers leadership toward a more integrated, convenient, and efficient statewide rail system.

Chapter 1 provides the statewide context of California's multimodal transportation system, outlining the key trends and opportunities guiding transportation planning; characterizing rail's role in the State transportation system; and highlighting key multimodal policies, programs, and plans on which statewide planning for the rail network is based. This chapter also reviews the rail governance structure and identifies funding opportunities from Federal, State, local, and other sources.



1.3 State Multimodal Transportation

California’s multimodal transportation system, consisting of highway, rail, transit, seaport, and airport systems, provides the foundation from which the State economy can flourish. It provides residents with access to jobs, and businesses with access to markets. New trends and opportunities are emerging in all modes and scales of transportation planning, and were considered and incorporated in developing the Rail Plan.

1.3.1 California’s Rail System Summary

In California, freight rail services are provided by two Class I railroads, or large railroads; and 27 Class III railroads, or small railroads. The National Rail Passenger Corporation (Amtrak) operates four long-distance services. The State of California sponsors three corridor services. There are five commuter railroads in the State of California, of which the newest commenced operations in 2017. Most of these passenger services operate over trackage owned by the Class I railroads.

Table 1.1: California Transportation Facilities^[2]

Freight Rail Route Mileage	
Freight: Class I Railroads	5,418
Freight: Class III Railroads	1,317
Freight: Switching Terminals	275
Passenger Rail Route Mileage	
Long-Distance	887
Intercity Passenger Rail	1,663
Commuter and Regional Rail	830
Urban Mass Transit Rail	382
Highway/Roadway	
Highway/Roadway Mileage	175,818
Airports	
Commercial Service Airports	28
General Aviation Airports	215
Special Use Airports	68
Ports	
Seaports (Inland and Coastal)	12
International Ports of Entry	6

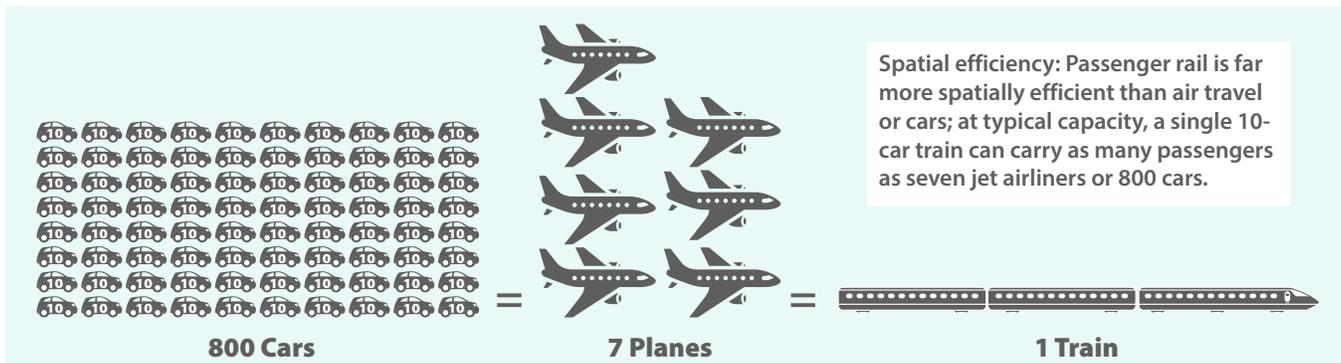


Exhibit 1.1: Spatial Efficiency Across Modes

2 Route miles are estimated by adding each agency or railroad company’s operating route miles.

1.3.2 Trends and Opportunities

The Rail Plan addresses the following key trends and opportunities for the California transportation system:

Population growth. The State population is now 39 million; this is almost four times its 1950 population of 10 million, when the core of California's highway (interstate) transportation system was built. This quadrupling of the population results in severe congestion on roads, rail, airports, and bridges. By 2040, the State's population is projected to grow from 39 million^[3] to 50 million.^[4] Accommodating population growth, while transporting people and goods, will pressure the already-strained capacity of the State's transportation system. The integrated rail system envisioned for 2040 in the Rail Plan will provide significant new, reliable capacity to the existing transportation system, moderating the pressure of population growth.

Mega-Regional Planning. Mega-regions are extended geographical areas around a metropolitan center that connect regions through transportation and communication networks. They often have interlocking economies, shared natural resources and open space, and overlapping transportation networks.^[5] Comprehensive evidence shows that mega-regions are emerging as an efficient scale for planning and managing transportation, labor, housing, land use, and economic systems. California is home to both a northern and southern mega-region (see Exhibit 1.2);^[6] increasingly, the regional planning organizations in these areas are not in a position to optimize services without considering the cross-border and cross-regional impacts.^[7]

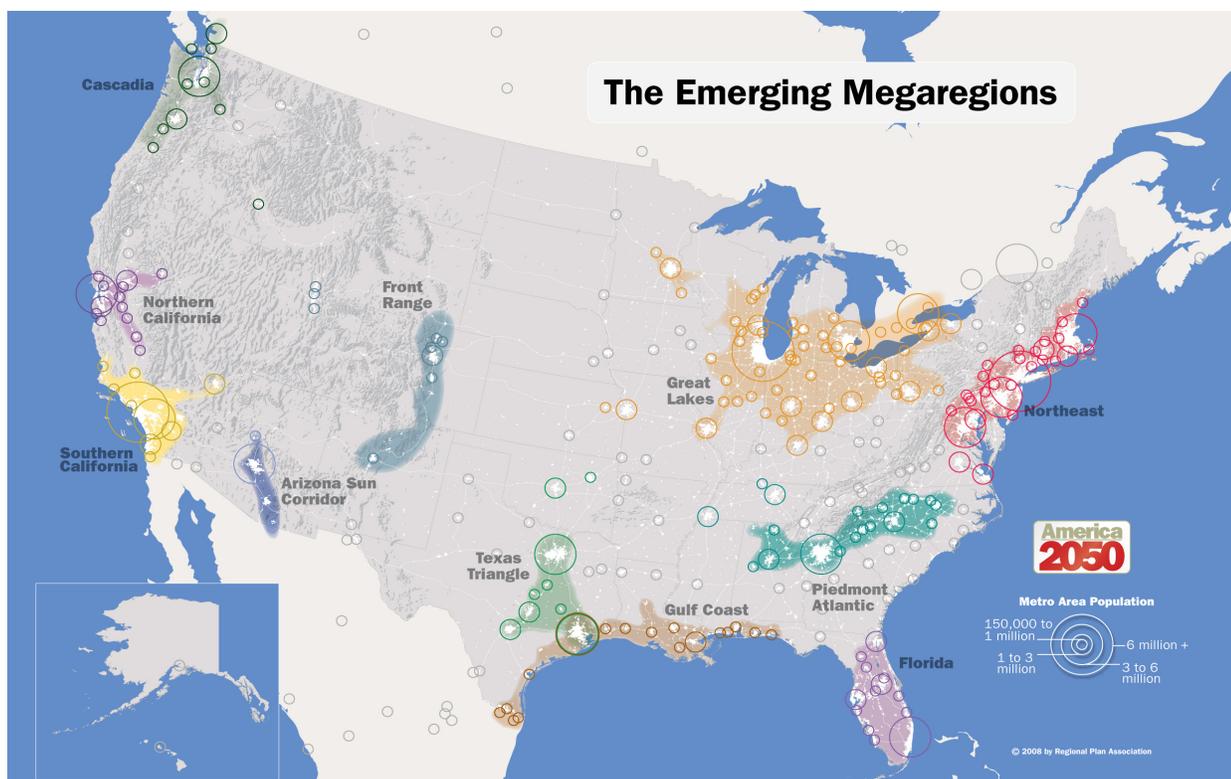


Exhibit 1.2: Emerging Mega-Regions in the U.S. and their Areas of Influence (2013)^[8]

3 California Department of Finance, *Population Estimates for California* (2015).
 4 California Department of Finance, *New Population Projections: California to Surpass 50 Million in 2049* (2013).

5 Regional Plan Association, "Emerging Mega-Regions in the U.S. and Their Areas of Influence," accessed 2017.
 6 The research names 10 or 11 nationwide mega-regions; two are in California. The California mega-regions account for nearly 95 percent of the State's population.
 7 Bay Area Council: Economic Institute, *The Northern California Megaregion: Innovative, Connected, Growing* (2016).
 8 Regional Plan Association, "Emerging Mega-Regions in the U.S. and their Areas of Influence," accessed 2017.

System preservation. Much of California’s multimodal transportation system was built in the mid-20th century, and is approaching the end of (or exceeding) its useful life. Simply maintaining the existing transportation system generates significant internal and external costs. Internal costs include sustaining quality operations and performing frequent maintenance and upkeep to ensure that the existing capacity can accommodate demand, and that public health and safety are preserved. External costs include harmful pollutants emitted by motor vehicles, airports, railroads, and seaports. These pollutants adversely affect public health and contribute to global climate change, which jeopardizes the State’s ecological and economic future. A stronger freight and passenger rail system, along with the anticipated mode shift, will help alleviate the demands on existing highway infrastructure and with anticipated mode shift to reduce the rate of degradation of the existing transportation system.

California Air Quality and Climate Change Mandates. The passage of Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, was landmark legislation requiring California to reduce GHG emissions to 1990 levels by 2020. SB 32 (Statutes of 2016) requires GHG levels to be 40 percent below 1990 levels by 2030. Governor’s Executive Order B-30-15 further requires GHG levels to be 80 percent below 1990 levels by 2050. The transportation sector must play a large role in these reductions, which are the most aggressive in the country. Climate change is already affecting California, with extreme heat, more frequent and intense wildfires, poor air quality, drought, and related public health concerns—as well as sea-level rise and flooding—which threaten transportation infrastructure and economic vitality. These impacts escalate maintenance and preservation costs, and may seriously affect transportation infrastructure, causing economic disruptions, safety issues, and reduced quality of life. A more extensive and efficient rail system can reduce the transportation sector’s substantial GHG emissions; add resiliency to the transportation system; mitigate climate change’s adverse impacts; and contribute to California’s ambitious GHG reduction requirements.

As elaborated in the air quality study presented in Chapter 6 of this Rail Plan, with the implementation of the Rail Plan 2040 Vision, the anticipated mode shift from highways to rail will reduce carbon dioxide emissions per passenger mile of travel by nearly 20 times.

First- and Last-Mile Connections.

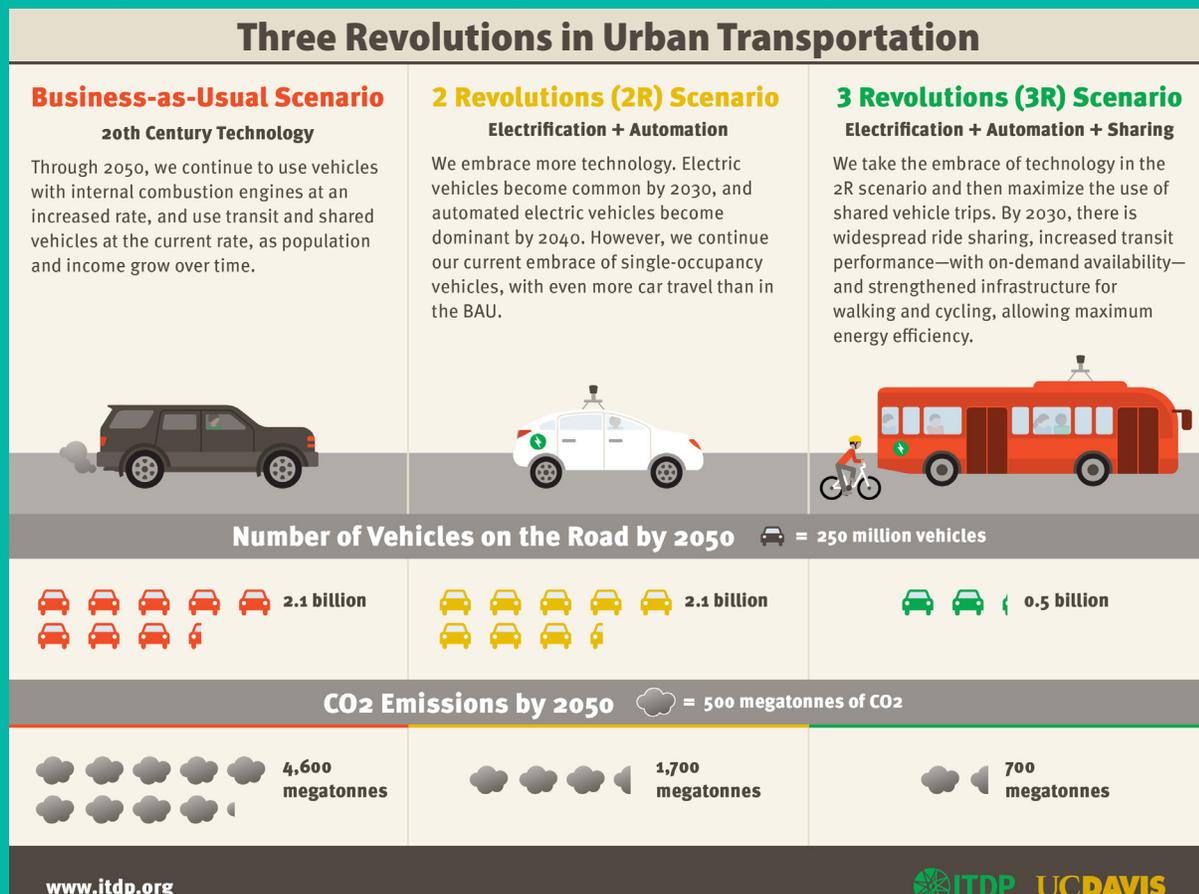
A rail journey does not begin when a passenger boards a train, but when the passenger leaves their home or place of work on the way to the rail station. Similarly, the journey does not end when the train pulls into the arriving station, but when the passenger arrives at their final destination. Covering this gap between the rail stations and the origin and destination is known as the “first/last mile connection.” Solutions to this challenge (discussed in Chapter 3) include, among other things, emerging technologies that enhance bike-share, car-share, and transit park-and-ride schemes.



Emerging Technologies

Transportation will continue to encounter fundamental innovations and changes. Research out of the UC Davis Institute of Transportation Studies defines the most significant changes as the three revolutions – electrification, automation, and shared mobility. Hyperloop, among other theoretical future technologies, could present additional opportunities for rail and transit. These technologies are largely untested at scale. Strong, coordinated policies can guide implementation to help achieve GHG emissions targets, livability, and mobility goals.

These technologies can be positive, but their implementation is the key. Electrification can improve air quality, but will only reduce GHG emissions if power is generated by renewable energy. Automation may improve efficiency and reduce labor costs; however, it may incentivize traffic congestion and sprawl. Shared-mobility can reduce vehicle miles traveled (VMT) and GHG, reduce car ownership, and promote biking and walking, but policies and leadership are required to ensure a sustainable system. The key is efficient, equitable use of limited space. Leading research indicates that the associated benefits of automation and electrification may be lost, or even that sprawl may be encouraged and congestion and GHG emissions may be increased, if these technologies are not linked to increased shared mobility and active transportation. The State is neutral on specific technologies and supports studying opportunities for partnership with companies exploring these technologies, but better use and expansion of rail and transit capacity in California will yield the greatest, most far-reaching benefits.



Note: Numbers in the exhibit represent global figures, but the principles are consistent in a California context.

Exhibit 1.3: Three Revolutions in Urban Transportation (ITDP, UC Davis)

A changing rail funding landscape. California recently passed SB 1, authorizing an estimated \$52 billion in tax revenue over the next decade to help cover the State's transportation needs. A substantial portion will be dedicated to rail and transit needs. SB 1 adds a ½ percent diesel sales tax specifically in support of intercity and commuter rail operational and capital needs. It also adds significant new revenue to public transit, which includes commuter rail and other high-capacity transit corridors that are essential to the integrated rail network. This is funded by a new 3.5 percent diesel sales tax and \$350 million per year from new vehicle license fees that support both transit and intercity rail capital needs. Combining this funding with existing funding for rail and transit, such as the Transit and Intercity Rail Capital Program (TIRCP) and subsequent modification SB 9, the State has committed to fund transformative capital improvements that focus on connectivity between systems. California is dedicated to modernizing the entire transit system, and many significant investments can be made to improve the rail network within this expanded budget authority.



Rail Investment Funding Sources:

- Local Transportation Fund
- Local Sales Tax
- State Transit Assistance
- Intercity Rail Program Funding
- State Transportation Improvement Program
- California GHG Reduction Fund
- Transit and Intercity Rail Capital Program
- HSR Funding
 - Proposition 1A bonds
- Additional funding and program enhancements guided by SB 1
 - State Transit Assistance
 - State Rail Assistance
 - Transit and Intercity Rail Capital Program
 - Congested Corridor Program
 - Trade Corridor Enhancement Account
- Federal Discretionary Programs
 - TIGER/BUILD
 - FASTLANE/INFRA
 - FTA Capital Investment Grants
 - FRA FAST Act Grants
- Federal Formula Programs
- Public Private Partnerships

Advances in Rolling Stock

As technology advances, so do the options for delivering a low- and zero-emission rail network. California is recommending the electrification of many parts of the rail network. Although the air-quality benefits of electrification have been demonstrated, there are other tangible benefits that accrue from electrification. Electric trains can accelerate and decelerate faster and stay at top speed for longer periods of time, allowing trains to make more trips and provide faster travel times for passengers. More frequent service reduces reliance on schedules and increases the number of available seats. In addition to lowering GHG emissions, electric trains are quieter and can offer lower operating and maintenance (O&M) costs. Passengers and surrounding residents will no longer be exposed to exhaust generated by diesel locomotives. Benefits to fuel economy also include higher energy efficiency due to regenerative braking capabilities, and less power lost when the train is idling. However, electrification is not the only path to improved operations, lower costs, and reducing or eliminating emissions.

In addition to fully electrified electric multiple unit (EMU) systems, diesel multiple units (DMUs), battery-hybrid multiple units, renewable diesel, and other alternative fuels offer service improvements and cost savings. Modern DMUs began appearing in the United States in the last 15 years. Since then, DMUs have entered service in the San Francisco Bay Area (Sonoma-Marín Area Rail Transit District [SMART]) and San Diego (Sprinter). Within the next year, DMUs will be operating between Pittsburg and Antioch (eBART). DMUs' appeal today is partly because they have lower cost profiles in comparison to locomotive-hauled trains, but also because they are smaller, quieter, and less invasive to the communities they serve than the traditional locomotive-hauled equipment. In terms of the total O&M costs per train mile, multiple unit regional rail services can operate at \$20 to \$60 per train mile. Traditional commuter railroads tend to range between \$50 and \$200. Multiple unit services achieve train operating costs below nearly all traditional locomotive rail services. Capital costs for rolling stock can also be much lower, because separate locomotives and passenger cars are not needed.

DMUs and emerging battery hybrid systems in particular offer an opportunity to capture the improved cost and operational benefits of EMUs with increased flexibility in shared corridors; options for overcoming physical or capital cost challenges to catenary or third rail operations; and rolling stock flexibility between electrified and nonelectrified portions of the network. Battery hybrid and DMU systems are an important tool in phased implementation and market development. As battery technology improves and hybrid systems are increasingly deployed around the world, there will be improved opportunities to study, develop, and implement such technology in California.



High-Speed Rail. The deployment of HSR in California will revolutionize the efficient movement of large volumes of people at fast speeds over long distances, and will do so at an anticipated lower operations cost than other rail and transit services in the state. Additionally, HSR is perfectly suited to accommodate mega-regional travel, and to address planning challenges that may arise from the scale, pace, and form of urbanization.⁹ For the first time in California, there will be a significant alternative to automobile travel for medium-distance travel, and an air-competitive option in many markets.

Integrated passenger rail service. The HSR System will revolutionize intercity travel in California; coupled with existing rail, it will provide an extensive and practical rail system. The Rail Plan's integrated service concept lays the foundation for a coordinated rail network. By integrating HSR, intercity rail and bus, and regional rail and local transit, this 2040 Vision benefits residents in rural, suburban, and urban areas across the state. Implementation of the integrated service concept will reduce transfer times, increase service frequencies, integrate ticketing, and help local services coordinate with each other; changes that are expected to dramatically boost ridership and lead to operating efficiencies. In addition, connections to neighboring states and Mexico will be streamlined as California's rail system grows and matures.

Freight Benefits. As described in detail in Chapters 5 and 6, planned investments in freight rail would generate a range of benefits. They increase the efficiency of the freight system, reducing travel times, costs, and emissions of existing trips. Efficiency and capacity improvements attract trips away from other modes (primarily trucks), potentially saving costs, emissions, and time—as well as improving the safety of those trips. Diverting trips to other modes can also lower congestion, positively impacting emissions and safety on the roadway networks generally. The investments can make a region more economically competitive, attracting development from other regions. These benefit transfers from one geographic area to another are not always counted as net benefits, and benefit tabulation varies by methodology.

Rail Congestion Trends. A central concern for California's rail system is to ensure that there is sufficient capacity to handle current and anticipated rail traffic in a timely and efficient manner. Insufficient capacity leads to poor service performance, reducing the competitiveness of rail service with other modes, and increases costs for service providers. Such “bottlenecks” were analyzed for the Rail Plan, and capacity needs for current and projected passenger and freight traffic were identified. Bottlenecks are defined as locations where a rail line's practical capacity is less than what is required for projected traffic volumes. Practical capacity is driven by infrastructure configuration (number of tracks, signal system type, etc.) and the number and mix of train types (passenger, HSR, manifest, intermodal, etc.) using the segment. For a given physical configuration, capacity is highest when all of the trains have the same dynamic performance in terms of operating speeds, acceleration, and deceleration. Conversely, large variations in the dynamic performance of various trains operating over a route will adversely affect capacity.

9 Catherine Ross, *Policy & Practice: Transport and megaregions: high-speed rail in the United States* (2011).

Highway Trends. A review of 5 years of mainline Annual Average Daily Traffic (AADT) volumes (2011 through 2015) obtained from the California Department of Transportation (Caltrans) Freeway Performance Measurement System database for specific locations along Interstate (I)-5, I-10, and I-80 showed increasing traffic volumes. These freeways parallel north-south and east-west existing Class I rail lines. The increases are not limited to metropolitan areas like Los Angeles and Alameda Counties. Increasing traffic volumes are also seen in inland counties like Merced and Stanislaus (along I-5), and Solano and Placer (along I-80). For example, east-west interstate AADT in Los Angeles County increased 4.9 percent over the period. Likewise, north-south interstate AADT in Stanislaus County increased 16.2 percent over the same 5 years.

This trend of increasing traffic volume is also seen in the increasing amount of time that segments of these freeways experience Level of Service (LOS) D (LOS D signifies that traffic conditions are approaching unstable flow) or worse during peak commute periods. AADT and LOS figures for metropolitan and inland counties over the 5 years are seen in Appendix A. The major implication here is that, absent major investments all along these major interstate freeways to increase speeds and fluidity, shippers may look increasingly to rail transportation as an alternative for north-south and east-west long-distance movements, presenting a unique opportunity for rail to play a larger role in major corridor movements, and not just remain a last alternative.



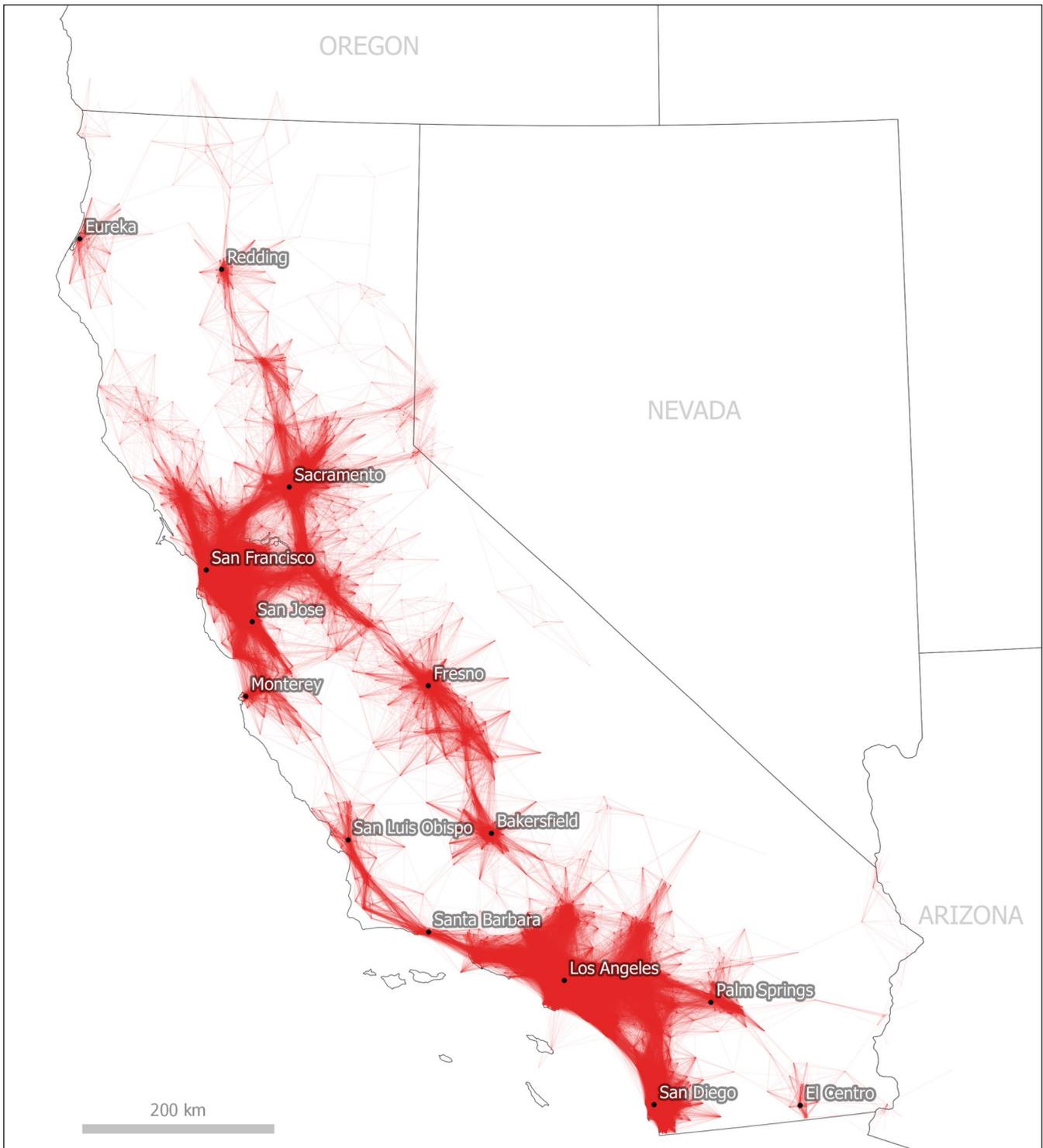


Exhibit 1.4: Tract-to-Tract Commutes of 80 km/50 Miles or Less in California ^[10]

Exhibit 1.4 shows the density of daily commuter travel activity within 50 miles of the large-scale mega-regions.

10 Garrett Dash Nelson, Alasdair Rae, *An Economic Geography of the United States From Commutes to Megaregions*, "Tract-to-Tract Commutes of 80 km/50 miles or less in California", 2017.

Airport Trends. There are 26 commercial airports in California. Of these, 11 accounted for more than 98 percent of total passenger enplanements in 2015. As seen in Table 1.2, the two airports with the highest volume of enplanements are Los Angeles and San Francisco. Over the last 5 years, these two airports experienced increases in enplanements of 19.1 percent and 20.6 percent, respectively. Rapid growth has been seen at six other airports: San Diego, Oakland, Santa Ana, Sacramento, San Jose, and Palm Springs. Enplanements dropped over this period at Ontario, Burbank, and Long Beach airports. The total growth in enplanements was 16.5 percent.



Table 1.2: Enplanements for California’s Top 11 State Airports 2011-2015

Airport	Code	2011	2012	2013	2014	2015	Change Over Period
Los Angeles	LAX	30,528,737	31,326,268	32,425,892	34,314,197	36,351,272	19.1%
San Francisco	SFO	20,056,568	21,284,236	21,704,626	22,770,783	24,190,560	20.6%
San Diego	SAN	8,465,683	8,686,621	8,878,772	9,333,152	9,985,763	18.0%
Oakland	OAK	4,550,526	4,926,683	4,770,716	5,069,257	5,506,687	21.0%
Santa Ana	SNA	4,247,802	4,381,172	4,540,628	4,584,147	4,945,209	16.4%
San Jose	SJC	4,108,006	4,077,654	4,315,839	4,621,003	4,822,480	17.4%
Sacramento	SMF	4,370,895	4,357,899	4,255,145	4,384,616	4,714,729	7.9%
Ontario	ONT	2,271,458	2,142,393	1,970,538	2,037,346	2,089,801	-8.0%
Burbank	BUR	2,144,915	2,027,203	1,918,011	1,928,491	1,973,897	-8.0%
Long Beach	LGB	1,512,212	1,554,846	1,438,756	1,368,923	1,220,937	-19.3%
Palm Springs	PSP	759,510	867,720	875,699	953,607	947,728	24.8%
Total		83,016,312	85,632,695	87,094,622	91,365,522	96,749,063	16.5%

Source: https://www.faa.gov/data_research/aviation/

The Federal Aviation Administration forecasts growth of around 2 percent per year at the State’s three largest airports. Such a rate could push Year 2040 enplanements at Los Angeles to 56.3 million, at San Francisco to 38.7 million, and at San Diego to 16 million.^[11] Rail, therefore, plays a very important role as airport capacity throughout the state reaches its maximum. Efficient rail services among mega-regions provide excellent alternatives that bring passengers right to the city centers rather than the airports, which are usually located away from the city

centers. Along with rail and transit, linkages to the airports from the city centers will become ever more important over the next two decades for moving people efficiently to and from airports. As expanding airport capacity becomes more challenging (i.e., the cost of land in urban areas, and the environmental impacts of building on green fields or potential relocation expenses^[12]), HSR offers viable alternatives to alleviate capacity constraints on short interstate air trips.

11 Federal Aviation Administration, *Terminal Area Forecast Summary*, Fiscal Years 2015-2040.

12 International Transport Forum, *Expanding Airport Capacity Under Constraints in Large Urban Areas* (2013).

1.4 Role of Rail in the State Transportation System

Supporting a changing population, an expanding economy, and an intersecting social, political, and physical environment will require new and strategic transportation planning. Coordination between different modes of transportation and land use planning must drive priorities to ensure that no one system bears an undue burden to provide access and mobility to all of California's communities.

California's multimodal transportation system, consisting of highway, rail, transit, seaport, and airport systems, provides the foundation from which the State's economy can flourish. It provides residents with access to jobs and services, and businesses with access to markets.

Rail is an essential element of California's multimodal transportation network. Of all transportation technologies or modes, rail is best able to move people and goods quickly and safely, for less money, and with far fewer environmental impacts. This section aims to address the key ways in which rail supports and enhances California's multimodal transportation system. The importance of rail to the state cannot be underestimated. California must meet the challenges of accommodating a growing and changing population, expanding the economy, reducing GHG emissions, and protecting the environment, while increasing the livability and quality of life for all Californians, especially the most disadvantaged.



The rail system has the potential existing latent capacity to provide additional 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 also be automobile- and air-competitive. This will not only motivate travelers to use rail and transit for more daily trips, but will complement needed capacity on roads and at airports—expansions that will require significant investment.

The State rail system provides essential mobility for both residents and goods. The Rail Plan provides the framework for helping the State rail system meet these goals. Specifically, the integrated passenger rail service concept in the Rail Plan will facilitate a coordinated rail system, increasing its utility for existing rail users; incentivizing more rail travel; and further leveraging rail's economic, environmental, safety, and quality-of-life benefits. Along with investing in passenger rail, existing rail corridors will become more fluid and reliable, allowing domestic and international goods movement by rail to grow as a share of total goods movement.

1.4.1 Mobility

The State's rail system provides both residents and industries with a competitive travel alternative to highway and air travel, lowering household and business transportation costs, and mitigating the roadway congestion caused by continued growth. California must improve and increase the efficiency of all modes and intermodal connections to address its transportation challenges; it needs competitive options to spur progress toward scalable solutions, both in and across regions.

1.4.2 Economic Development and Demographic Changes

Since the Great Recession (December 2007 through June 2009), unemployment and housing foreclosure rates have decreased nationwide, and State and municipal credit ratings have steadily improved, contributing to a positive economic outlook for the State.^[13]

A robust passenger rail system supports the economy by providing Californians with access to jobs, education, health care, goods and services, and social and recreational activities. The freight rail system is an important vehicle through which California goods and services reach international, national, and local markets, thereby sustaining California jobs.

Over the coming decades, the State’s population is projected to grow 25 percent, while the number of households is expected to grow similarly. The projected population increase would bring the State total to 47 million residents. Los Angeles, Riverside, San Bernardino, and San Diego Counties are expected to add the most people by 2040. Employment is projected to increase by a similar annual rate during this period; the expected 2040 employment is approximately 20 million workers. Los Angeles, Riverside, San Bernardino, and San Diego Counties are also expected to add the most jobs by 2040. Table 1.3 displays these population, household, and employment data.

Table 1.3: Statewide Demographic Forecasts^[14]

	2010	2020	2029	2040
Population	37,335,085	40,639,392	43,624,393	46,804,202
Households	12,583,816	13,910,434	15,088,299	16,465,705
Employment ^a	16,204,377	18,488,891	19,548,788	21,295,761

^a Total nonfarm employment.



13 U.S. Bureau of Economic Analysis, *Regional Economic Accounts*, Q2, 2015.

14 Analysis for the Rail Plan was based on the data available in 2017, which was estimated at 48 million. This change in forecast does not make any material impact in the recommendations of the plan.

This anticipated population growth will increase demand for consumer products and associated goods movement, warehousing, distribution centers, and intermodal facilities. Additional freight growth will be driven by national and international consumer demand. Much of this freight is generated by the busiest port complex in the nation: the Port of Los Angeles (POLA) and the Port of Long Beach (POLB). Freight rail offers the most efficient way to transport certain types of goods across the state and the nation. A sustainable, reliable, and cost-effective freight rail system helps California ports and businesses compete with those in neighboring states, Mexico and Canada, fostering industrial growth and economic opportunity for Californians.

Demands for passenger and freight rail have increased over the past several years (see Exhibits 1.5 and 1.6). As of 2018, California is the fifth largest economy in the world, with a gross domestic product surpassing \$2.7 trillion.^[15] California businesses export roughly \$162 billion worth of goods to more than 225 foreign countries annually.^[16]

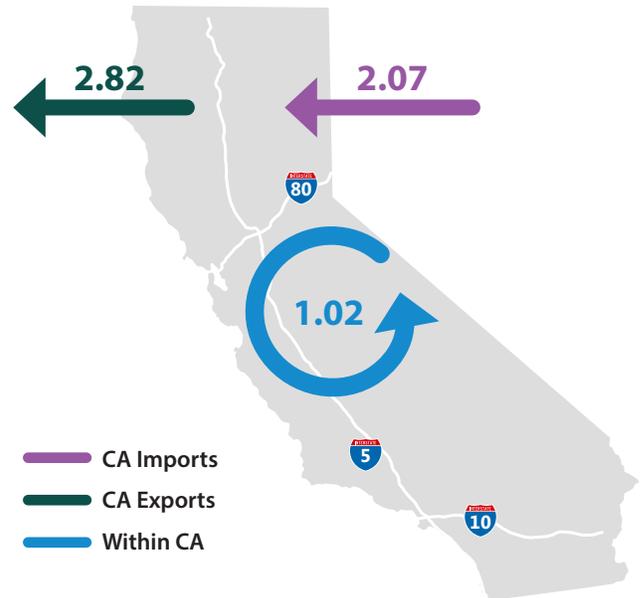


Exhibit 1.6:
Total Increase in California Rail Freight Tonnage Flows 2012-2015 (in million tons)^[18]

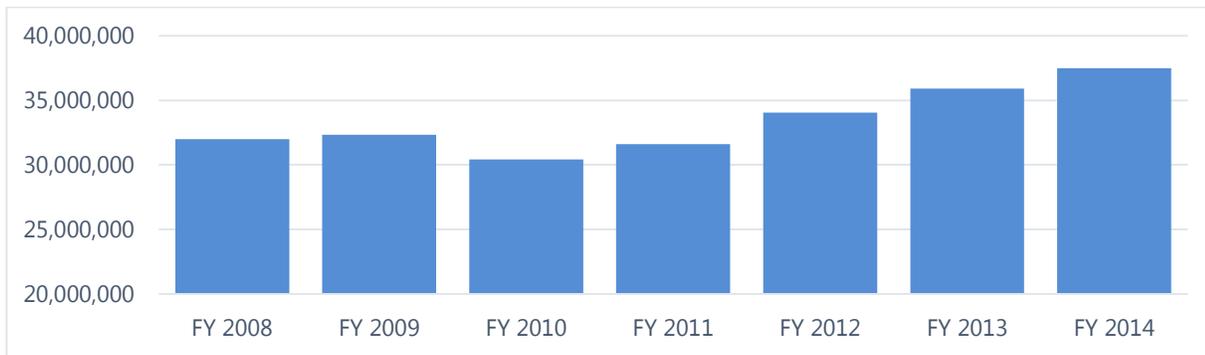


Exhibit 1.5: California Passenger Rail Ridership for ACE, Caltrain, COASTER, Metrolink, Pacific Surfliner, San Joaquin, Capitol Corridor Lines by State Fiscal Year^[17]

15 Bureau of Economic Analysis, US Department of Commerce. (<https://www.bea.gov/regional/bearfacts/pdf.cfm?fips=06000&areatype=STATE&geotype=3>)

16 International Trade Administration, "Trade Stats Express. U.S. Dept. of Commerce" (2012).

17 Amtrak (2016).

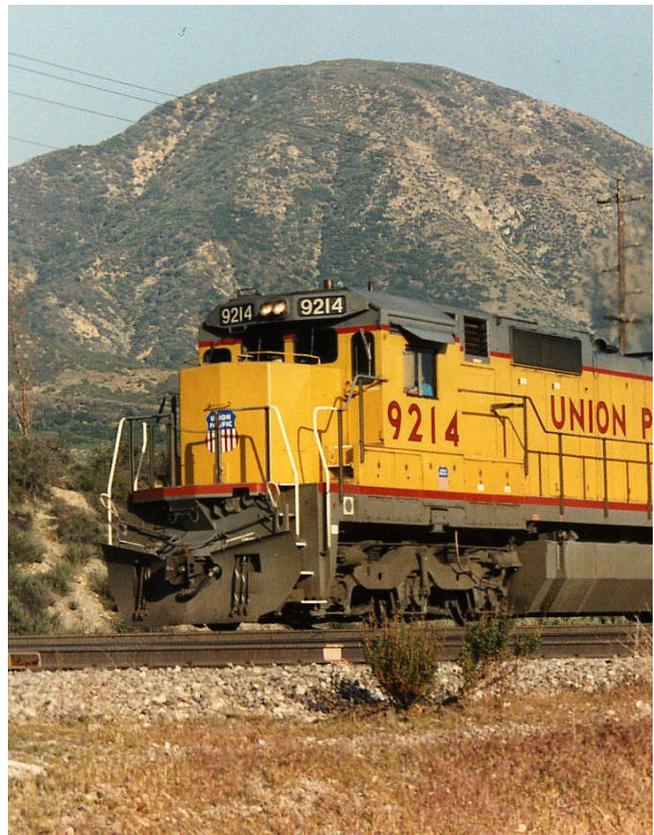
18 Note: Total flows selected for rail domestic mode. Figures calculated using three extractions: California origin to combined national total destination (CA Exports); combined national total origin to California destination (CA Imports); and California origin to California destination (Within CA). Within CA totals were subtracted from CA Exports and CA Imports to avoid double counting. Source: Oak Ridge.

Rail forms an increasingly integral part of California's transportation system, and will play a key role in accommodating the growth of this system. Amtrak operates more than 70 intercity trains per day in California; attracting 5.6 million boardings annually, up from 3.6 million a decade earlier.^[19] California commuter rail ridership grew to nearly 33 million trips in fiscal year (FY) 2016, from 21.6 million trips a decade earlier.^[20] These commuter rail services connect to California's urban transit systems, which served 1.5 billion trips in 2014.^[21]

Changes in the age distribution of the growing population could also increase dependency on the passenger rail system; the State's population aged 60 and older is projected to increase from more than 6 million in 2010 to more than 12 million in 2040.^[22] As the population ages, people increasingly need mobility assistance; providing access to quality rail and transit helps people with mobility needs or those who can no longer drive to maintain their independence. Also, younger generations may increasingly choose rail transport. For example, Millennials,^[23] those who were born around 1980 and reached adulthood around 2000, have shown a preference to reside in urban centers with good public transportation systems; this allows them to save money by avoiding automobile ownership.

The State rail system also plays a central role in the movement of goods, both in California and nationally. Today, the State generates approximately 51 million tons of freight, receives 94 million tons from out of state, and generates 27 percent of the nation's intermodal volume in terms of units (more than 30 million tons of cargo annually).^[24] Much of this freight is generated by the busiest port complex in the nation, the POLA and POLB.

Lastly, the railroad industry is a significant employer in the State. Amtrak and the freight railroads combined have 11,500 California employees, earning \$1 billion in wages and benefits.^[25]



19 Amtrak, Amtrak Fact Sheet, *Fiscal Year 2015 State of California*, 2016.

20 American Public Transit Association, *Public Transportation Ridership Report: Fourth Quarter 2015*.

21 Federal Transit Administration, National Transit Database 2014, Table 19: Transit Operating Statistics: Service Supplied and Consumed, Accessed 2016.

22 California Department of Aging, *California State Plan on Aging*, 2013–2017.

23 APTA, *Millennials & Mobility: Understanding the Millennial Mindset*, October 2013.

24 STB, Waybill Sample (2013).

25 Association of American Railroads, *Railroads and States, California*, accessed 2017.

1.4.3 Passenger Rail Demand and Growth Trends

According to an analysis comparing patterns and projections between 2010 and 2040, in year 2010, Californians took an estimated 361 million annual interregional trips on all modes of travel. California's busiest interregional travel market exists between the Los Angeles Basin^[26] and San Diego County (98.2 million annual person trips),^[27] followed by Sacramento^[28] to/from the San Francisco Bay Area^[29] (42.3 million); the Bay Area to/from the northern San Joaquin Valley^[30] (31.2 million); the Los Angeles Basin to the southern San Joaquin Valley^[31] (25.1 million); and the Los Angeles Basin to the Central Coast^[32] (22.1 million).

By 2040, interregional travel is forecast to increase by 50.9 percent to 544.7 million (Exhibit 1.7) trips annually, out of which about 70 percent of the increased demand can be addressed through an efficient rail network, mainly in the mid- to long-distance range. The mode shift model^[33] shows that almost 90 percent of the long-distance travel (200- to 350-mile range) may be partially or entirely on a HSR segment that is well connected to the statewide network. The California High-Speed Rail Authority (CHSRA) Ridership Gaussian Process Regression Model estimates approximately 14 million annual long-distance HSR riders in 2029 and 41.3 million annual long-distance HSR riders in 2040.^[34]

The regional economic concentration will be reflected in California's five busiest interregional travel corridors by 2040, which are projected to account for over 60 percent of the total 544.7 million interregional person trips by year 2040:

- Los Angeles Basin to/from San Diego (139.1 million)
- Sacramento to/from San Francisco Bay Area (73.5 million)
- San Francisco Bay Area to/from the northern San Joaquin Valley (48.9 million)
- Los Angeles Basin to the southern San Joaquin Valley (38.9 million)
- San Francisco Bay Area to/from Central Coast (29.7 million)

The rail system will be an important element for meeting this growing interregional travel demand, and a better integrated rail/transit system with high-speed service can serve a higher proportion of this demand. As portrayed in Exhibit 1.7, the growth in interregional passenger travel and 2040 annual two-way person trip figures shows that several regional pairs are expected to experience over 70 percent increases in interregional travel (see reddish-brown arrows). These include the San Francisco Bay Area-Sacramento, San Francisco Bay Area-San Joaquin Valley South, Sacramento-San Diego, Sacramento-Northern California, Sacramento-San Joaquin North, and Sacramento-San Joaquin Valley-South pairs. The interregional market growth are shown as percentages in boxed numbers which will likely continue to involve travel between the State's major metropolitan areas and adjacent regions, such as the Los Angeles Basin-San Diego and San Francisco Bay Area-Sacramento pairs.

26 Includes Ventura, Los Angeles, San Bernardino, Orange, Riverside, and Imperial Counties.

27 California Statewide Travel Demand Model, 2016.

28 Includes Placer, El Dorado, Yuba, Sutter, Sacramento, and Yolo Counties.

29 Includes Sonoma, Napa, Solano, Marin, Contra Costa, San Francisco, Alameda, San Mateo, and Santa Clara Counties.

30 Includes San Joaquin, Amador, Calaveras, Stanislaus, Tuolumne, Merced, Mariposa, and Madera Counties.

31 Includes Fresno, Kern, Kings, and Tulare Counties.

32 Includes Monterey, San Benito, San Luis Obispo, Santa Barbara, and Santa Cruz Counties.

33 California High Speed Rail Authority, California High-Speed Rail Ridership and Revenue Model, 2016.

34 Long-Distance Trips = Trips > 50 miles. Source: California High Speed Rail Authority, California High-Speed Rail Draft 2018 Business Plan – Ridership and Revenue Risk Analysis, 2018.

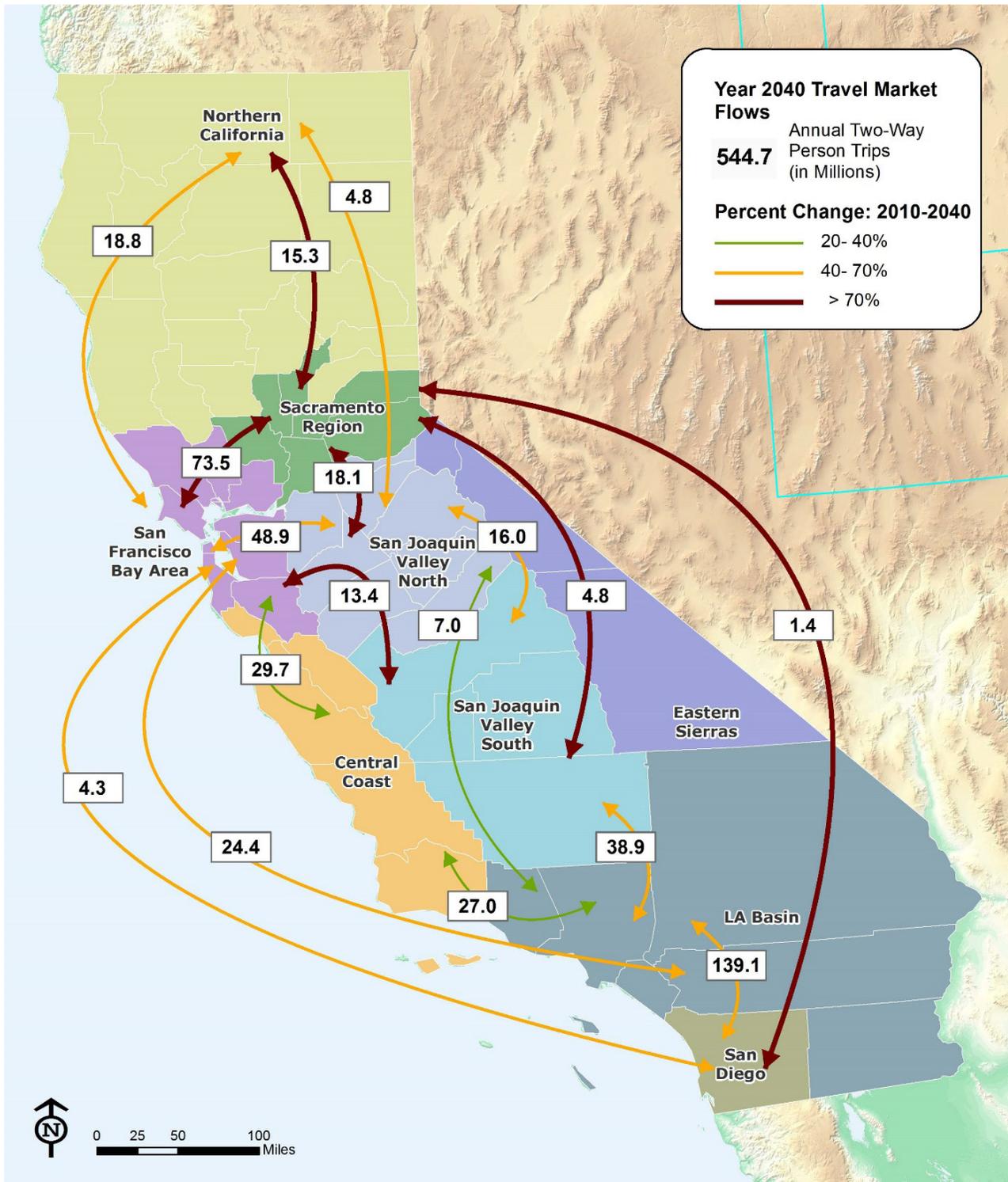


Exhibit 1.7: Growth in Intraregional Personal Travel, 2010 to 2040 ^[35]

Note: This exhibit shows data for the largest and/or highest-growth interregional travel markets. To retain legibility, some travel markets are not shown on the map.

35 California High Speed Rail Authority, *California High-Speed Rail Ridership and Revenue Model*, 2016.

1.4.4 Freight Demand and Growth Trends

As of 2018, California is the fifth largest economy in the world, with a gross domestic product surpassing \$2.7 trillion.^[36] California businesses export roughly \$162 billion worth of goods to more than 225 foreign countries annually,^[37] and all of this has implications for freight rail in the state.

To understand how traffic trends may impact California's rail system, traffic was projected for the year 2040 and compared with a base year of 2013.^[38] Overall base year and 2040 tonnages for the top carload commodities are shown in Exhibits 1.8 and 1.9.

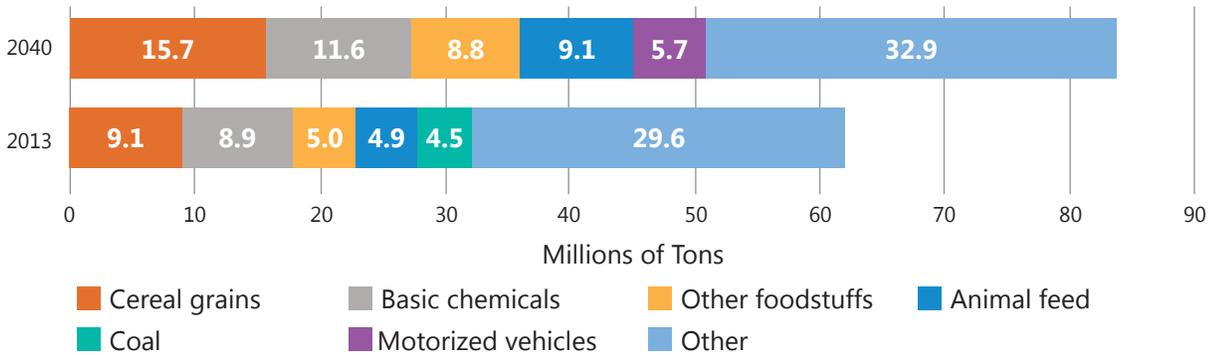
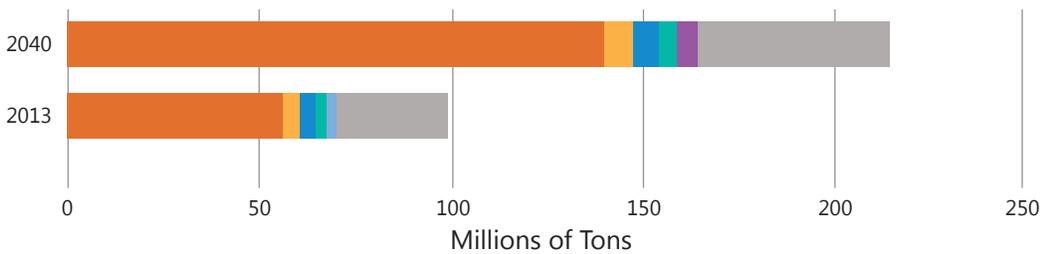


Exhibit 1.8: Top 5 Rail Carload Commodities (millions of tons), 2013 and 2040^[39]



Commodity	2013	2040
Mixed freight	56.2	139
Cereal grains	4.7	8
Basic chemicals	3.5	7.2
Gravel	3.1	4.6
Textiles/leather		4.6
Other foodstuffs	2.6	
Other	28.4	49.9

Exhibit 1.9: Top 5 Rail Intermodal Commodities (millions of tons), 2013 and 2040^[40]

36 Bureau of Economic Analysis, US Department of Commerce. (<https://www.bea.gov/regional/bearfacts/pdf.cfm?fips=06000&areatype=STATE&geotype=3>)

37 International Trade Administration, "Trade Stats Express. U.S. Dept. of Commerce" (2012).

38 The process was used to develop the rail traffic forecast, as described in Appendix A,

39 Source: STB Confidential Carload Waybill Sample and forecast from FHWA Freight Analysis Framework 3.5.

40 Source: STB Confidential Carload Waybill Sample and forecast from FHWA Freight Analysis Framework 3.5.

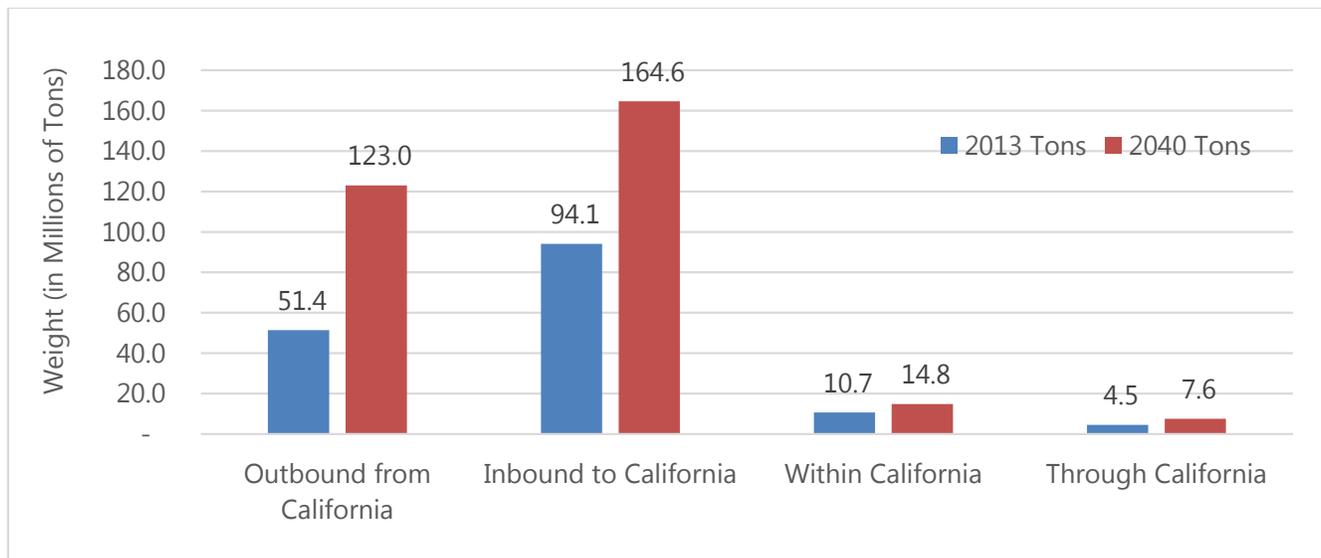


Exhibit 1.10: Directional Distribution of California Rail Tonnage, 2013 and 2040^[41]

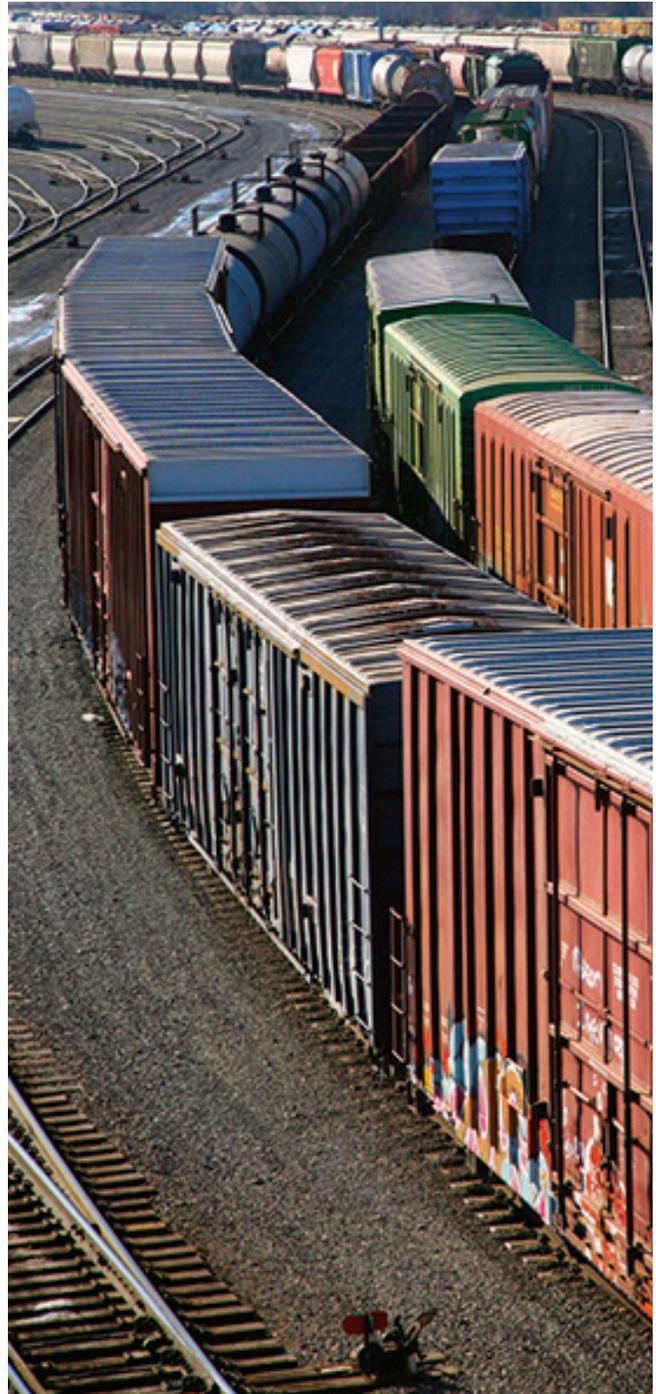
Exhibit 1.10 shows the general inbound, outbound, intrastate, and through flow of tonnage in California. The majority of the traffic is either inbound or outbound. Intrastate traffic is negligible, a reflection of California's economic geography and the superior competitiveness of rail for long-haul moves. Similarly, California's location and the topography of its rail network result in very modest volumes of through-traffic.

Both inbound and outbound traffic are expected to increase by roughly the same amount: approximately 70 million tons. Because the outbound tonnage is almost half the amount of the inbound tonnage in 2013, the increase in outbound tonnage seen in 2040 is more substantial than that of inbound traffic.

41 STB, 2013 STB Confidential Carload Waybill Sample, Freight Analysis Framework (FAF) 3, Ports of Long Beach and Los Angeles, 2013.

Exhibits 1.11 and 1.12 show the general direction of movement of tonnage by region for intermodal and carload traffic.^[42] Notably, in 2013, 63 percent of all traffic (intermodal and carload tons) originated and terminated in the Midwest/Northeast (including Canada) and Pacific Northwest (North). At the same time, 31 percent of all traffic originated and terminated in the Southeast (southern states and Mexico). Intermodal traffic is a mostly east-west flow, while the westbound flow from the Midwest/Northeast dominates carload movements. This total traffic will double by 2040; the directional flows remaining largely the same: 63 percent to/from the Midwest/Northeast and Pacific Northwest, and 32 percent to/from the Southeast. Rail traffic in California (the circular flows) will grow by 38 percent from 2013 to 2040.

Current and projected 2040 freight train volume trends along California's major railroad network are shown in Exhibits 1.13 and 1.14, which show that freight growth along the transcontinental route is increasing at a much faster pace than the population growth in California, demonstrating the role that California plays in the movement of goods and the overall economy of the nation. These figures reflect volumes on major railroads only, and do not include locals, short hauls, and other movements such as light engines, equipment transfers, and maintenance of way. The strongest growth in freight traffic is expected along the Union Pacific Railroad's (UPRR's) Sunset Route east of Los Angeles, the BNSF Railway's (BNSF's) Central Valley Route south from Sacramento to Barstow, and east of Los Angeles on BNSF and UPRR routes. The highest growth in intermodal rail traffic is expected east of Sacramento on the UPRR Overland Route, south of Sacramento through the Central Valley toward Barstow, and between Los Angeles and points east. Consistent with recent trends, intermodal train volumes are expected to grow faster than carload volumes.



42 For the definitions of the regions found in these exhibits, please refer to Chapter 4.

Intermodal
Millions of Tons
2013



Intermodal
Millions of Tons
2040

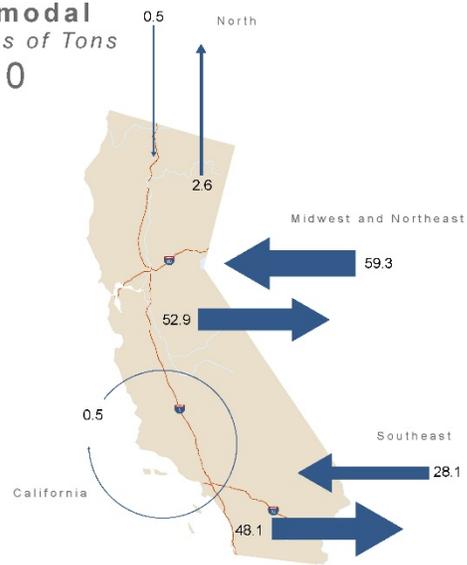
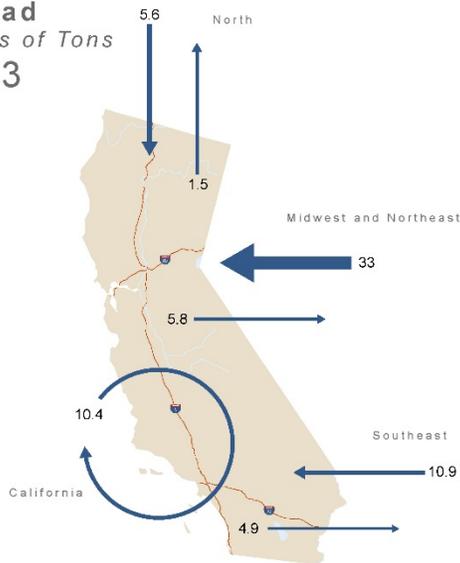


Exhibit 1.11: Intermodal Freight Flows 2013 and 2040, Tonnage and Direction ^[43]

Carload
Millions of Tons
2013



Carload
Millions of Tons
2040

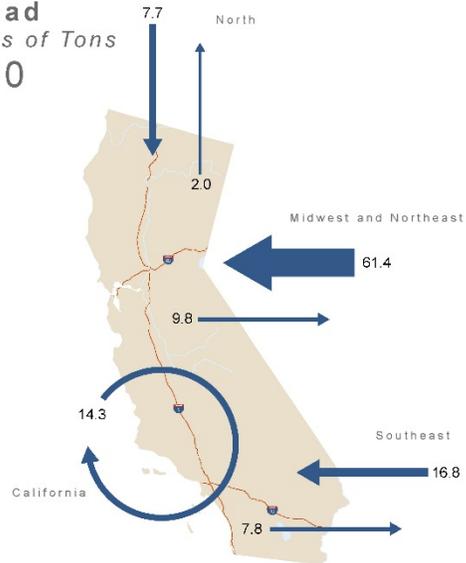


Exhibit 1.12: Carload Freight Flows 2013 and 2040, Tonnage and Direction ^[44]

43 STB, 2013 STB Confidential Carload Waybill Sample, Freight Analysis Framework (FAF) 3, Ports of Long Beach and Los Angeles.

44 STB, 2013 STB Confidential Carload Waybill Sample, Freight Analysis Framework (FAF) 3, Ports of Long Beach and Los Angeles.

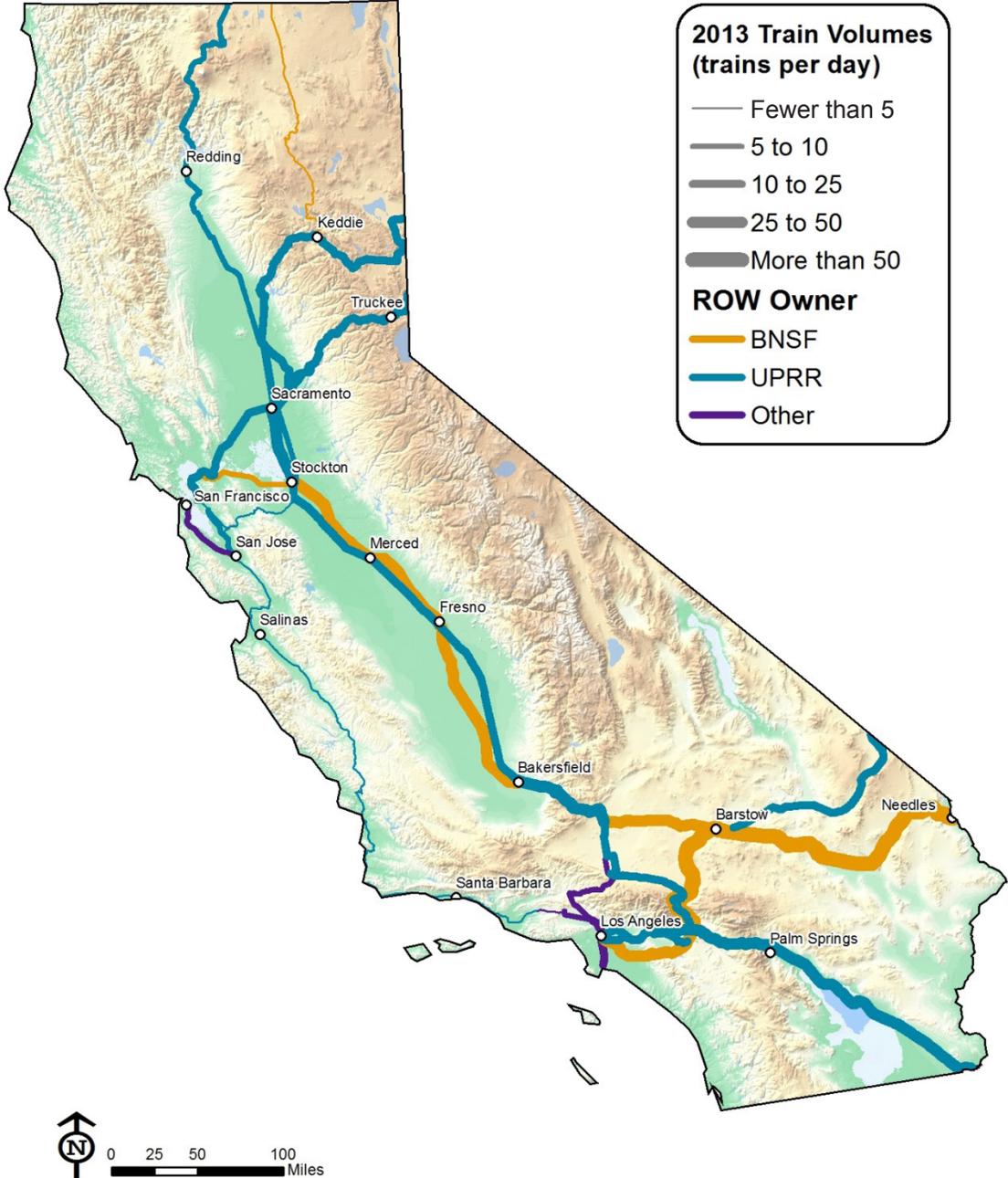


Exhibit 1.13: Volumes on Major Railroads, 2013

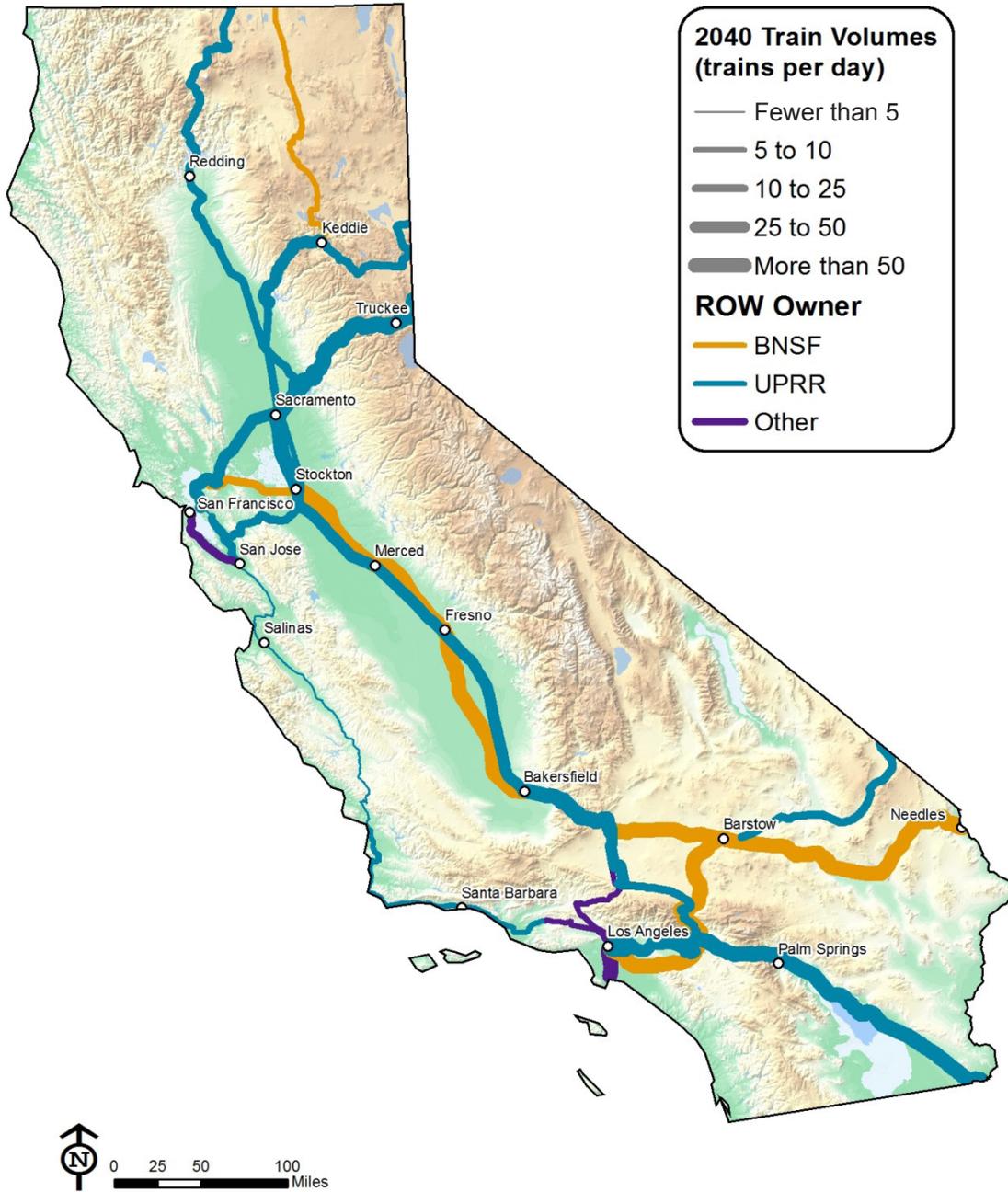


Exhibit 1.14: Expected Change in Volumes on Major Railroads, 2013-2040

As shown in Exhibits 1.13 and 1.14, the greatest growth is seen in the BNSF's Needles Subdivision between Barstow and Needles, and in the UPRR's Yuma Subdivision around Palm Springs, which increase by 60 and almost 50 trains per day, respectively. The UPRR Fresno, the BNSF Stockton, and the BNSF Bakersfield Subdivisions through Central Valley each will have a modest increase of around 20 freight trains per day. Combined across corridors, freight movement between Stockton and Sacramento will have an increase of more than 60 freight trains per day. The UPRR Roseville Subdivision from Sacramento to Reno (east of Truckee) will have increase of almost 50 freight trains per day. A significant mode shift^[45] from highways to rail is assumed by rail forecasts along these long-distance freight corridors, implying the capacity improvements that will be needed along major trade corridors. It is pertinent that the State's policy supports the infrastructure to accommodate the projected growth, and maintain California's competitive edge in the global market and throughout the nation.

Declining Coal Demand

The production of coal has dropped by about 46 percent since a 2008 peak. Although there are some uneven geographic impacts, and the near term-expectations for coal production and consumption are modestly positive, the long-term projection for coal is for continued and steep declines. Coal represents the single highest-volume commodity shipped by rail. U.S. production has been in decline since 2008. The near-term outlook is modestly positive due to the weakening dollar and regulatory changes. The long-term outlook will experience continued substantial declines.



45 California High Speed Rail Authority, California High-Speed Rail Ridership and Revenue Model, 2016.

Energy Sector Demand

The crude oil market is sensitive to global prices, which plummeted in the fourth quarter of 2014 before steadying. The net result has been that development of new oil production in the United States cratered, and crude by rail (CBR) volumes have decreased by 80 percent from the peak.^[46] Inbound supplies (frac sand, drill pipe, and chemicals) began to recover in 2016. Some opportunities for CBR remain, particularly between North Dakota and the West Coast, and the Canadian tar sands and refiners in the United States. The resulting increase in rail capacity has driven down rates for other commodities. The per-bushel cost to carry spring wheat from North Dakota to the West Coast has dropped by a third over the past 2 years, according to United States Department of Agriculture.

Challenges to California Competitiveness

Potential challenges to freight movement from Asian manufacturing influence the State's partnerships to support ports and capture related economic benefits. Though California remains the most direct route to Asia, the Panama Canal expansion makes East Coast Ports stronger competitors for some markets. Rail traffic originating at the California ports could likewise shift. In 2002, Southern California ports handled 39 percent of container imports in the United States; by 2013, it had decreased to 32 percent. There have also been some shifts in Asian manufacturing, driven by higher wage rates in China that have begun to trigger a shift in manufacturing activity to Near East Asian countries such as India, which is equidistant to the East and West coasts of the United States. There are also strong reshoring and near-shoring trends to the United States and Mexico, which both result in freight rail potentially being shifted away from California rail lines.

Intermodal and International Growth

Additionally, California intermodal traffic is expected to continue to grow. The large population centers make California's ports attractive for international traffic, thus ensuring the continued viability of inland movement by rail. The Rail Plan anticipates that intermodal rail traffic will double by 2040, driven largely by the doubling of international cargo growth pressure along principal trade corridors, especially those with high volumes of intercity passenger service. This will require more efficient use, as well as expansion, of existing capacity in shared corridors. Trade corridor improvements must be coordinated with intercity passenger network development, which may include separated freight tracks in congested locations.

In 2013, 62.1 million and 98.6 million tons of goods were moved in carload and intermodal services, respectively. The large share of intermodal traffic reflects the substantial container volumes associated with the San Pedro Bay and Oakland Ports. By 2040, these totals are expected to grow to 96.8 million tons of carload and 213.3 million tons of intermodal, respectively; with compound annual growth rates of approximately 1.7 and 2.9 percent for carload and intermodal service, respectively. The top five carload commodities are anticipated to grow at similar rates, with cereal grains showing the strongest growth. For intermodal traffic, mixed freight shows the greatest increase, with its share of the market increasing from 57 percent in 2013 to 65 percent in 2040.

46 Wall Street Journal. <http://www.wsj.com/articles/freight-rail-traffic-tumbles-on-falling-coal-oil-demand-1438982945>.

Implications for California

These and other recent trends—including declining coal demand and shifting logistics and manufacturing landscapes—have implications for California,

First, pressure on capacity will be reduced in the near term, because of declines in coal/energy use and reduced growth projections for carload traffic. There is a long-term need to provide the capacity to realize opportunities to explore new markets and new revenue sources for rail. These markets must be consistent with the State’s long-term interest to utilize existing rail rights of way to provide for future transportation options—which could otherwise result in additional lanes of freeway in congested urban corridors. Public rail investments can be used to spur economic development and take advantage of rail energy and environmental efficiencies where it is cost-effective.

Second, the level of intermodal growth projected in this Rail Plan will prioritize state investments in dedicated rail freight improvements on ports and national trade corridor routes to provide sufficient capacity for intermodal rail freight movements.

Finally, partnerships between the State, regions, ports, and railroads are important to preserve market share for California ports, and this is reflected in the priorities for freight identified in the Rail Plan.

1.4.5 Land Use and Quality of Life

For decades, California has both benefited from and been challenged by high rates of growth and urbanization. Often, this growth has taken the form of low-density suburban sprawl, placing burdens on the transportation network and the environment as California’s infrastructure expansion struggled to meet demands to move people and goods over greater distances. However, recent policies and trends suggest that perhaps that pattern may be slowing down, which could shorten trips and therefore help alleviate congestion and reduce emissions.

Land use and transportation policy are connected and co-dependent. The ultimate goal of both is to sustainably manage growth while continuing to facilitate economic development and improved quality of life. State policy actions, specifically the passage of SB 375 (2008),^[47] reflect the State’s recognition of the importance of coordination as a way to create healthy communities. Many local jurisdictions have begun implementing land use policies targeted toward transit-oriented development (TOD),^[48] infill development,^[49] and other strategies likely to increase passenger rail demand.

Rail has a unique effect among transport modes, in that its structure of networked nodes (organized around rail stations and connection points) and its spatial efficiency (moving more people and goods using less physical space) result in efficient land use. A connected network, “specifically, the synergy between a modern, statewide rail network, with HSR as its backbone, will catalyze more compact land use patterns, the combined effect of which will be even greater reductions in GHG emissions.”^[50] This effect has key benefits, both for the transportation system and the environment, because concentrated development around stations spares rural land and open space from the pressures of urban development. Less energy and travel time are needed to transport people and goods. With

47 SB 375 is the Sustainable Communities and Climate Protection Act of 2008—explained in Section 1.5.2.

48 Transit-oriented development: moderate to higher-density development in easy walking distance of a major transit stop.

49 New development and redevelopment projects on vacant or underused land in existing developed areas.

50 California High Speed Rail Authority, California High-Speed Rail Sustainability Report, December 2016.

efficient use of rail, positive environmental and social benefits are created for communities, while further enhancing economic strength and resilient transport networks.

Some regional planning organizations, like the Metropolitan Transportation Commission (MTC), have developed their Sustainable Communities Strategies (SCSs) to require that all new development happen in the existing urban footprint.^[51] These types of strategic and coordinated land use and transportation planning processes are also supported by State environmental goals,^[52] as described by the Air Resources Board and the Strategic Growth Council.

Integrating rail systems with multimodal transportation and land use planning that minimizes sprawl offers residents, workers, and tourists more travel choices and better access to jobs, retail, entertainment, recreational facilities, and open spaces. A connected statewide network will improve the quality of life for all, and help mitigate concerns regarding access, particularly for those people living in transit-dependent households, which are often vulnerable communities. By working to connect passenger and commuter rail systems with complementary transit, bicycle, and pedestrian infrastructure, greater access and mobility will be realized. These improvements support livable communities for all, improved public health, and reductions in VMT and automobile dependency.

Station Area Planning

Robust station area planning is an important land use and development trend that can help solve the first mile/last mile challenge, maximize ridership, integrate statewide services, and optimize returns on public investment. Dense, walkable development near rail stations not only provides seamless connections between rail services and origins and final destinations—thereby decreasing overall travel times—but also leverages public investment in the rail network through sustainable development and value capture. Focusing urban development

at or near rail stations is important in preventing sprawl, maintaining neighborhood affordability and equity, sustainably growing California’s cities and communities, and maximizing the environmental benefits of integrated statewide rail transportation.

Rail stations are complex places that must balance the competing needs of physical rail infrastructure, often multiple rail service providers or public agencies, and the local community and local governments. Because of the value created through effective rail transportation, the land on, above (air rights), or walkable to rail stations is typically quite valuable relative to the station’s location and how well it is served. Planning is needed to effectively understand the trade-offs involved in prioritizing dense, walkable development, transit access, and/or parking availability. Strategic implementation of those plans is needed for effective development around stations, and to capture the value created by the station. For these reasons, effective, long-range planning and governing structures are crucial to both optimizing the station operations and leveraging the value created in the community.

Health and Equity

The role of public transit in public health is increasingly recognized by health advocates and transportation providers alike. Transportation is not an end in itself, but a means of providing access to important destinations, including jobs, education, healthy foods, recreation, worship, community activities, and healthcare. This is especially critical for disadvantaged and underserved communities where public transit may be the only mode of transportation. Adequate, affordable public transit that reduces travel times will ensure the healthy well-being of the community.

The Rail Plan supports policies that promote health and equity, including extended bus service to rural areas; expanded bicycle, walking, and transit trips to provide first-and-last-mile transit connections; and safe nonautomobile modes for shorter trips. These kinds of transportation-related policies and programs foster more accessible, livable, and healthier communities. Through collaboration between rail and health providers, improving transportation and health can be achieved in a manner that will benefit entire communities.

51 Plan Bay Area (MTC’s SCS) identifies Priority Development Areas and Priority Conservation Areas, and calls for all new development to happen in the current urban footprint. Other MPOs prioritize urban infill development.

52 California Air Resources Board, *Vibrant Communities and Landscapes A Vision for California in 2050*. (2016).

1.4.6 Environment

The California Air Resources Board's 2014 update to its Climate Change Scoping Plan emphasized increased certainty in humans' role in climate change and accelerating the impacts of climate change, which is already affecting California through its contributions to extreme heat, more frequent and intense wildfires, low air quality, and increased sea-level rise. An increase in the global average temperature of 3.6 degrees Fahrenheit (°F) above pre-industrial levels (2.0°F above present levels) "poses severe risks to natural systems and human health and well-being."^[53]

Rail investments contribute to reduced impacts on the environment by offering shippers and travelers a cleaner alternative to motor vehicle and air travel. In the Bay Area, the Caltrain corridor alone is responsible for saving more than 200 metric tons of GHG emissions per day. Over the course of the year, that equates to 50,000 metric tons of carbon dioxide saved, and more than 1 million dollars on the cap-and-trade market, just from mode shift.^[54] Electrification of the Caltrain line will lead to further net air quality benefits in the form of reduced on-board emissions from the switch away from diesel trains.



53 California Air Resources Board, *First Update to the Climate Change Scoping Plan* (2014).

54 UC Berkeley, UC Connect Study, *Rail and the California Economy* (2017).

Passenger rail services often provide cost- and time-competitive alternatives to automobile travel, particularly when accompanied by increased development density, mixed land uses, connected transit services, and safe bicycle and pedestrian ingress and egress to stations. The freight rail system reduces environmental impacts further by removing heavy truck traffic from roadways. The Ventura County Port's reinvestment in their short line railroad (Ventura County Railroad) has taken the equivalent of 5,000 trucks off the road each year at a reduced emissions profile.^[55] Reduced motor vehicle use eases roadway congestion and improves air quality by lowering on-road emissions. Investments in grade separations and crossings also reduce surface vehicle traffic delays and associated emissions per mile. Additional emissions reductions result from requirements for diesel locomotives, State and regional investment in cleaner locomotives, and other operational improvements, such as electric wayside power at layover facilities and stations.

California's set of vehicle, fuel, and land use policies is projected to decrease passenger transportation emissions by 50 percent over the next 2 decades.^[56] Because rail travel generates significantly lower GHG emissions per passenger mile and freight ton-mile than automobiles and trucks, investment in rail facilities promotes progress toward meeting State GHG emissions reduction goals.

In 2015, Amtrak riders in California generated approximately 835 million passenger miles.^[57] Four of California's commuter railroads—Caltrain and Altamont Corridor Express (ACE) in the Bay Area, Metrolink in the Los Angeles area, and COASTER in San Diego County—carried 107,000 riders on average per weekday in 2015, generating a savings in VMT of 3.2 million.^[58]



55 UC Berkeley, UC Connect Study, *Rail and the California Economy* (2017).

56 California Air Resources Board First Update to the Climate Change Scoping Plan (2014).

57 Amtrak, *Amtrak Fact Sheet, Fiscal Year 2015 State of California*, 2016.

58 Assuming an average trip length of about 30 miles, according to the Public Transportation Fact Book, American Public Transportation Association (2011).

1.4.7 Safety

The Federal Railroad Administration (FRA) tracks “all accidents and incidents resulting in injury or death to an individual or damage to equipment or a roadbed arising from the carrier’s operations during the month.”^[59] Exhibit 1.15 summarizes California and national passenger rail–related accidents and incidents from 2006 to 2015. Overall accidents/nonfatal incidents in California accounted for 8 percent, and mirrored the national average.

Despite these trends, the FRA reports that fatalities per mile are 17 times more likely in an automobile than in an intercity passenger train.^[60] Moving freight by rail reduces the number of trucks on roads—reducing congestion and the potential for truck-related accidents. This supports the State’s goal of ‘Toward Zero Deaths’ to be achieved in coordination with local Vision Zero programs to move toward zero fatalities or serious injuries on highways and arterial roads.^[61]

Investments in new technologies, such as Positive Train Control (PTC), can further contribute to improved rail system safety. At-grade crossing improvements, such as crossing gates, warning systems, physical barriers, and grade separations, help reduce potential conflicts between rail vehicles, motor vehicles, bicyclists, and pedestrians.

Investment in HSR further improves the safety of the rail system. Mode shift leads to reductions in VMT, which lead to lower incidences of traffic accidents; and an integrated, statewide rail network provides a competitive alternative to driving.

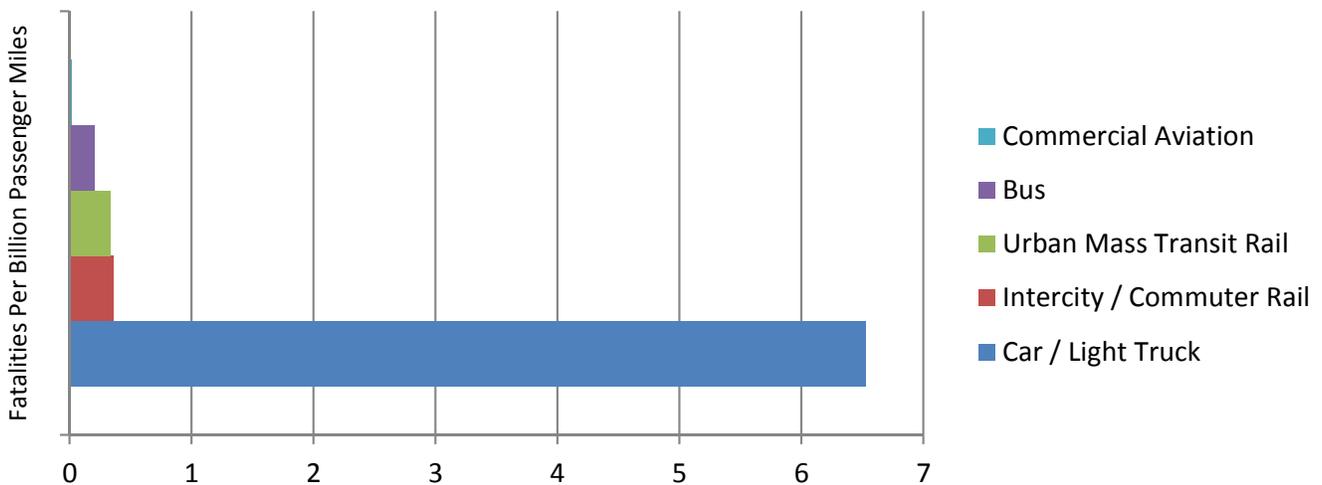


Exhibit 1.15: National Fatalities by Transportation Mode ^[62]

59 FRA, *FRA Guide for Preparing Accident/Incident Reports* (2011).

60 FRA, Office of Safety Analysis, accessed 2016, The rate for intercity passenger rail = 0.43 per billion; for car passengers/drivers = 7.3 per billion.

61 Caltrans, *California Transportation Plan 2040* (2016).

62 FRA, Office of Safety Analysis Website, accessed 2016.

The California Highway Patrol Office of Traffic Safety (OTS) reports annual fatality and injury statistics. Using 2010 as the base year,^[63] OTS reported 2,739 persons killed, or \$25.3 billion dollars in damages—just associated with loss of life. In 2010, there were nearly 200,000 additional injury collisions, and more than 250,000 property-damage only collisions,^[64] resulting in billions more in damages. The HSR analysis also assumes that accident rates stay constant over time; therefore, the only possibility for a reduction in incidences of accidents comes from mode shift. Further safety improvements and economic benefits will result from the integration of the entire network, as outlined in the Rail Plan.



63 2010 numbers were used for consistency with the HSR benefit-cost analysis data years, but it is worth noting that fatal accidents have increased every year since, and accidents per VMT have also increased.

64 California Highway Patrol, *2010 Annual Report of Fatal and Injury Motor Vehicle Traffic Collisions* (2010).

1.4.8 Tribal Context

Both passenger and freight rail systems, if properly maintained, serve as engines of economic growth, contribute to State environmental goals, improve safety, and enhance Californians' quality of life. The Rail Plan provides the framework for helping the State rail system meet these goals. Specifically, the integrated service concept in the Rail Plan will facilitate a coordinated rail system, increasing the system's utility for existing rail users; incentivizing more rail travel; and further leveraging rail's economic, environmental, safety, and quality-of-life benefits.

This Rail Plan seeks to ensure that Native American communities share in the benefits of a modernized, fully integrated rail system. In addition to fostering mobility, economic, and environmental benefits, the Rail Plan aims to promote the early inclusion of tribal governments during the planning and development of future rail projects, both to ensure the protection of California's diverse tribal cultural heritage and resources and to ensure that tribal concerns regarding mobility, accessibility, and connectivity are accounted for during the transportation planning efforts.

As part of the State Rail Plan development process, statewide outreach to Native American tribal government partners and stakeholders was conducted by Caltrans' Division of Rail and Mass Transportation (DRMT). Through a variety of outreach methods, the planning team sought to provide multiple opportunities for tribes to participate and provide input throughout the development of the Rail Plan, to help identify any concerns the tribes may have regarding the build-out of the 2040 Vision. The tribal outreach effort included selecting tribal representatives for the project's advisory committee; sending informational letters to tribal government leaders statewide at key milestones of the Rail Plan's development; attending and presenting information at the Caltrans Native American Advisory Committee meetings, and seeking the Committee's input; and holding statewide Tribal Listening Sessions to provide information, solicit input from the tribal participants, and again invite formal consultation with Caltrans regarding the development of the Rail Plan. In addition, multiple follow-up letters and emails were exchanged with tribes to address questions and concerns. By working closely with Tribal representatives, the planning team was able to provide geographic- and context-specific information for Tribes that requested such information, and to respond to concerns.

1.5 Policies and Programs

The Federal and California State governments have developed a series of policies and planning documents to guide the transportation system toward a more efficient use of public dollars by investing in the entire intermodal network—including highway, rail, and transit—and also addressing other trends in sustainability^[65] and smart growth.^[66] This section discusses the trends and implications for planning; Chapter 6 will elaborate on the funding sources and their potential uses.

1.5.1 Federal Policy Trends

Recent Federal transportation policies have shifted toward the application of performance-based planning principles, which rely on data and analytics to support policy decisions that help achieve desired outcomes. The Moving Ahead for Progress in the 21st Century Act of 2012 mandated a renewed emphasis on performance management in Federal-aid programs, and called for integrating performance-based approaches in statewide and regional transportation planning practices.

The most recent Federal surface transportation reauthorization legislation, the Fixing America's Surface Transportation Act of 2015 (FAST Act), allocates funding to states for highway, transit, and railway programs over a 5-year period. The FAST Act continues and reinforces the goals set forth in the Moving Ahead for Progress in the 21st Century Act of 2012, calling for performance-based benefit-cost analyses (BCAs) to support prioritization and funding of State plans and programs. Other Federal programs offer additional funding through competitive, performance-based grant programs. This shift toward performance-based planning has in turn forced State and regional planning and funding systems to require clear performance standards, measurable metrics, and achievable benchmarks.

The Better Utilizing Investments to Leverage Development (BUILD)(formerly Transportation Investment Generating Economic Recovery (TIGER)) grant program supports multi-modal and multi-jurisdictional projects, which are difficult to fund through traditional Federal programs. Awards focus on capital projects that generate economic development and improve access to reliable, safe, and affordable transportation for both urban and rural communities.^[67]

The FAST Act established a new National Highway Freight Program, with dedicated funding. Although the program is focused on highways, up to 10 percent is set aside for rail, ports, and intermodal projects. The program includes funds apportioned to states on a formula basis, and FASTLANE competitive grants. This new Federal program provides new opportunities for the State's freight rail program.

Eligible projects for Infrastructure for Rebuilding America (INFRA)/FASTLANE grants include railway-highway grade crossing or grade separation projects, or freight projects that are 1) an intermodal or rail project; or 2) within the boundaries of a public or private freight rail, water (including ports), or intermodal facility. For a freight project within the boundaries of a freight rail, water (including ports), or intermodal facility, these funds can only support project elements that provide public benefits.^[68]

65 In ecology, sustainability is the capacity to endure; it is how biological systems remain diverse and productive indefinitely. However, in more general terms, sustainability is the endurance of systems and processes.

66 Smart growth is an urban planning and transportation concept that concentrates growth in compact, walkable urban centers to avoid sprawl.

67 USDOT, *TIGER Discretionary Grants*, 2016.

68 USDOT, FASTLANE Notice of Funding Opportunity, 2016.

1.5.2 State Policy Trends

California has been at the forefront in proactively identifying and addressing critical trends that impact the condition and performance of a statewide transportation system, including:

Climate change. Since 2002, State legal and administrative directives have set policies aimed at reducing GHG emissions to limit the harmful effects of climate change. Investment in efficient freight and passenger rail systems constitute key steps toward meeting the targets of the following policies:

- California’s landmark “Global Warming Solutions Act of 2006,” AB 32, created the Cap-and-Trade program, and requires that California’s GHG emissions be reduced to 1990 levels by the year 2020. Executive Order B-30-15 (2015) establishes a California GHG reduction target of 40 percent below 1990 levels by 2030, and reaffirms the long-term target of reducing GHGs to 80 percent below 1990 levels by 2050 (Executive Order S-3-05).
- SB 375, the “Sustainable Communities and Climate Protection Act of 2008,” promotes integrated transportation and land use planning at the regional level to reduce GHG emissions from passenger vehicle travel, and helps California meet AB 32 goals. SB 375 requires the California Air Resources Board to develop regional GHG emissions reduction targets for passenger vehicle travel, setting benchmarks in 2020 and 2035 for each of the State’s 18 Metropolitan Planning Organizations^[69] (MPOs).^[70]
- AB 1482 (2015) directs ongoing updates to the State’s climate adaptation strategy, *Safeguarding California* (beginning in 2017), and requires future updates (every 3 years) to describe the vulnerabilities from climate change in a minimum of nine specific sectors, including transportation. It also identifies the priority actions needed to reduce climate risks in each of the sectors.^[71] Investment in efficient freight and passenger rail systems constitutes a key step toward meeting these targets.

69 An MPO is a Federally mandated and Federally funded transportation policy-making organization in the United States that is made up of representatives from local government and governmental transportation authorities.

70 Caltrans, 2013 *California State Rail Plan* (2013).

71 Ibid.

Dedicated State support for passenger rail systems. Governor Brown signed into law SB 1, the road repair and accountability act of 2017—the first legislation in more than 20 years to significantly increase state transportation funding.^[72] In addition to dedicated funding programs for rail, SB 1 authorized the Solutions for Congested Corridors Program, which will provide \$2.5 billion over 10 years for multimodal investments to improve the State’s most congested travel corridors. Corridor-based planning to be undertaken by Caltrans will place increased emphasis on rail and transit as a competitive solution for relieving congestion on state highways, and on reducing GHG emissions.

Complete streets. AB 1358 (2008) requires cities and counties to include complete streets policies in their general plans. These policies aim to ensure that roadways safely accommodate bicyclists, pedestrians, transit riders, children, the elderly, the disabled, and motorists. Complete streets policies can help improve Californians’ first-mile and last-mile connections to the state passenger rail system via urban transit, commuter rail, and intercity rail hubs.



72 CTC, *General Overview: SB 1*.

Sustainable goods movement. In 2015, Governor Brown issued Executive Order B-32-15, which directs State agencies to improve freight efficiency, transition to zero-emission technologies, and identify State policies, programs, and investments to achieve these goals while increasing the competitiveness of California’s freight system. Ensuring efficient access to markets through the freight rail system is a central component of this strategy.

Mitigating transportation impacts. SB 743 (2013) created a process to change the way transportation impacts are analyzed and mitigated to focus on reducing VMT instead of automobile LOS. This approach will promote projects and plans that reduce GHG emissions, emphasize infill development (use of existing undeveloped land), enhance multimodal transportation options, and encourage a diversity of land uses. SB 743 provides exemptions to the California Environmental Quality Act requirements to help streamline the environmental review process for certain transit and rail accessibility projects that do not add motor vehicle capacity.

Environmental Justice. SB 535, signed into law in September 2012, established environmental justice goals and requirements for the Cap-and-Trade program. The law addresses concerns that actions taken to achieve the goals laid out by AB 32 must not disproportionately affect low-income and disadvantaged communities. It states that 25 percent of the cap-and-trade funds are required to be used

for projects that will benefit disadvantaged areas, and that at least 10 percent must be allocated to projects actually located in disadvantaged communities. This legislation is part of increasing emphasis at the State level to link environmental justice, public health, and social and racial equity issues with other State goals, including GHG reductions and transportation goals.

Cap-and-Trade. AB 32 created the Cap-and-Trade Program, which requires California to reduce its GHG emissions to 1990 levels by 2020—a reduction of approximately 15 percent below emissions expected under a “business as usual” scenario. In addition, SB 862 established a long-term funding plan for portions of Cap-and-Trade Program money, including a continuous appropriation of 25 percent of the funds to HSR and 10 percent to the Transit and Intercity Capital Program. The Transit and Intercity Capital Program was created to provide grants from the Greenhouse Gas Reduction Fund to fund capital improvements that will modernize California’s intercity, commuter, and urban rail systems—and bus and ferry transit systems—to reduce emissions of GHGs by reducing congestion and VMT throughout California. With the passage of SB 1, an additional \$3 billion will be added to the TIRCP over the next 10 years. All of these mechanisms represent a significant and ongoing funding stream for the rail system. In 2017, AB 398 extended the Cap and Trade Program through 2030.



At-Grade crossing in San Mateo, California. Caltrans will continue to address public safety and environmental impacts of the rail system by supporting grade separation projects and modernizing the rail fleet.

1.5.3 Program Coordination

The Rail Plan is one of six periodically updated long-range modal plans that apply the vision, goals, and policies of the California Transportation Plan (CTP) to specific modes of travel. The Rail Plan clarifies rail's role in the multimodal transportation system.

California Transportation Plan 2040

California's long-range transportation plan, the CTP, is required, under SB 391 (2009), to identify "the statewide integrated multimodal transportation system" needed to reduce GHG emissions to 1990 levels by 2020, and 80 percent below the 1990 levels by 2050. SB 391 added this new requirement under AB 32 to help meet California's climate change goals by requiring the CTP to be updated every 5 years.

The CTP 2040 (2016) is an umbrella plan that integrates Caltrans' modal plans into a statewide multimodal transportation vision. CTP 2040 offers a detailed overview of the existing transportation network, and assesses future transportation trends and challenges. It offers strategies that improve mobility and accessibility across all modes, contribute to system preservation, support a vibrant economy, improve public safety and security, promote livable communities and social equity, and support environmental stewardship.

The CTP 2040 includes the State's transportation policies and performance objectives. It describes broad systemic umbrella concepts and strategies synthesized from Regional Transportation Plans (RTPs) and SCSs, and presents recommendations for transportation system planning. The CTP 2040 identifies a series of broad policies that aim to address recent trends and challenges, meet Federal and State regulatory obligations, and move toward a more efficient, competitive, multimodal transportation system (see Exhibit 1.16).

CTP 2040 Statewide Transportation Vision

California's transportation system is safe, sustainable, universally accessible, and globally competitive. It provides reliable and efficient mobility for people, goods, and services, while meeting the State's GHG emission reduction goals and preserving the unique character of California's communities.





INTERREGIONAL TRANSPORTATION STRATEGIC PLAN

Next Update: 2020

The Interregional Transportation Strategic Plan (ITSP) is California's long-range planning document for the interregional transportation system. It reflects input from the public, regional RTPs, and statewide modal planning. The ITSP prioritizes interregional state highway projects and summarizes information about other interregional transportation modes, including freight and passenger rail, to improve movement of people and freight safely and sustainably. The ITSP identifies 11 Strategic Interregional Corridors that are typically characterized by high volumes of freight movement and significant recreational tourism; they constitute the most significant interregional travel corridors in California.



CALIFORNIA AVIATION SYSTEM PLAN

Next Update: 2020

This plan includes updated programs and directives to better support aviation sustainability. It also provides guidance for Caltrans district planners and local planners for coordination with surface transportation systems, including rail and public transit systems.



CALIFORNIA FREIGHT MOBILITY PLAN

Next Update: 2019

The California Freight Mobility Plan (CFMP) is a statewide, long-range plan for California's freight transportation system. It was developed by CalSTA and Caltrans in consultation with the California Freight Advisory Committee (CFAC). The plan includes designation of priority freight corridors and identification of improvement projects supporting interregional goods movement. It serves as a foundation for ongoing work to achieve a sustainable freight transport system.



STATEWIDE TRANSIT STRATEGIC PLAN

Next Update: 2018

The Statewide Transit Strategic Plan helps the State and partners gain a better understanding of present and future roles and responsibilities to support public transportation. The plan provides a framework for a cost-effective transit system to improve mobility, meet associated GHG emissions targets, provide improved access to jobs, and make environmental improvements.



TOWARD AN ACTIVE CALIFORNIA STATE BICYCLE AND PEDESTRIAN PLAN

Updated 2017

Toward an Active California is a strategic policy plan that will guide the planning and development of active transportation facilities, and maximize future investments statewide. The plan calls for safe, convenient, and comfortable access to walking and bicycling for people of all ages, abilities, and incomes by 2040. This includes multimodal access to better integrate bicycle and pedestrian needs for enhanced connectivity with all modes, including planned high-speed, intercity, and commuter rail.



SUSTAINABLE FREIGHT ACTION PLAN

Updated 2016

Executive Order B-32-15 directed CalSTA and the California Environmental Protection Agency to develop a Sustainable Freight Action Plan (SFAP) in coordination with the California Air Resources Board (CARB), Caltrans, the California Energy Commission, and the Governor's Office of Business and Economic Development. The SFAP is intended to promote the state's environmental, public health, and safety goals in the freight sector. This plan establishes targets to improve multimodal goods movement efficiency, a transition to zero-emission technologies, and the increased competitiveness of California's economy.

Exhibit 1.16: Current Long-Range Transportation Plans

In response to State legislation and executive orders, CTP 2040 includes an innovative approach to address climate change and GHG emissions. Three scenarios were evaluated to illustrate the potential effectiveness of State policies, programs, and major investments on reaching GHG emissions goals. In addition to GHG reductions, each scenario was evaluated based on multimodal system performance and economic impacts.

Scenario analyses informed policy recommendations, which were refined through extensive outreach and coordination with stakeholders to reflect the full breadth of California's geographic and cultural diversity. The aim of CTP 2040 is to ensure that transportation and land use policy decisions and investments made at all levels of government, and in the private sector, will complement one another to enhance California's economy, improve social equity, support local communities, protect the environment, and achieve GHG reduction goals.



1.5.4 Regional Plans

A seamless interregional travel experience requires coordinated transportation planning and interagency cooperation with neighboring states, and at the State and regional levels. The FRA requires coordinated passenger rail planning under its new state rail planning guidelines. The FRA has indicated that the coordinated system-level and project-level planning presented in state rail plans and service development plans will be linked to future Federal funding for HSR or conventional intercity passenger rail projects.

Regional Transportation Plans and Sustainable Communities Strategies

RTPs are the long-term blueprints of regions' transportation systems. MPOs and regional transportation planning agencies (RTPAs) develop the RTPs as guided by Federal and State statutes. RTPs are the basis for statewide transportation plans, including the Rail Plan and CTP 2040, and all regional transportation investments, including regional and local rail.

SB 375 not only updated AB 32 to strengthen the GHG reduction targets for the State, but also required each MPO to prepare an SCS as a key component of its RTP. SCSs tie transportation investments to sustainable growth patterns as a strategy for reducing GHG emissions. All SCSs must contain transportation, land use, and housing strategies as a means to develop plans at a regional scale to reduce emissions and promote long-term sustainable development patterns and investments.^[73]

Each region's most recent RTPS/SCSs are incorporated into the State Rail Plan as underlying assumptions for service goals; and are likewise expected to use the State Rail Plan guidance to align their regional goals and priorities with statewide benefits and connectivity. Both the RTPs/SCSs and the Rail Plan align with the goals and policies of the CTP and inform funding and project delivery. However, the Rail Plan is mode-specific and therefore provides more detailed rail objectives. It also seeks to coordinate with future regional planning to better connect services between regions and across the state to increase ridership and improve mobility.

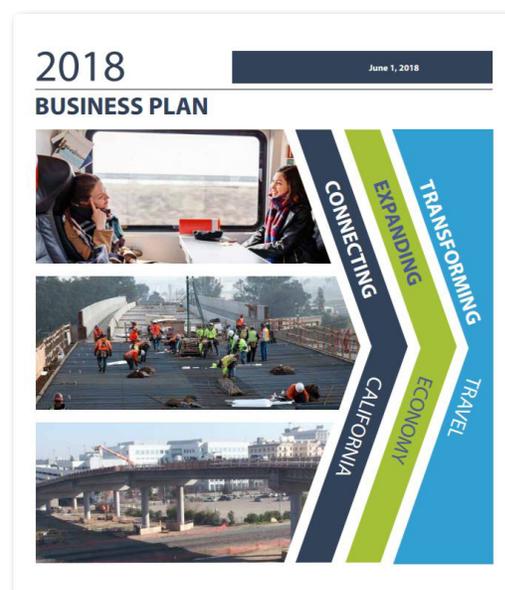
Additionally, the statewide travel demand modeling assumes that regions will plan for growth in priority development areas as outlined in SB 375, and therefore accounts for concentrated housing and jobs growth in certain parts of a region to facilitate coordinated land uses around transit-rich corridors.

1.5.5 Corridor-Level Plans

In addition to the Federal, State, and regional planning activities, all initiatives, plans, and studies developed directly by service providers and stakeholder agencies themselves at a corridor level were reviewed to inform the development of this Rail Plan, and to ensure that it aligns with local planning activities.

California High-Speed Rail Business Plan

CHSRA is responsible for planning, designing, building, and operating the planned HSR corridor connecting Northern and Southern California via the Central Valley. Pursuant to AB 528, the High-Speed Rail Business Plan summarizes the most recent HSR System plans, services, ridership forecasts, and financial scenarios. Updated every 2 years, this document forms a key input into planning and modeling efforts for the Rail Plan. CHSRA published its new 2018 Business Plan in June 2018.



73 Air Resources Board, *Sustainable Communities* (2016).

Southwest Multi-State Rail Planning Study

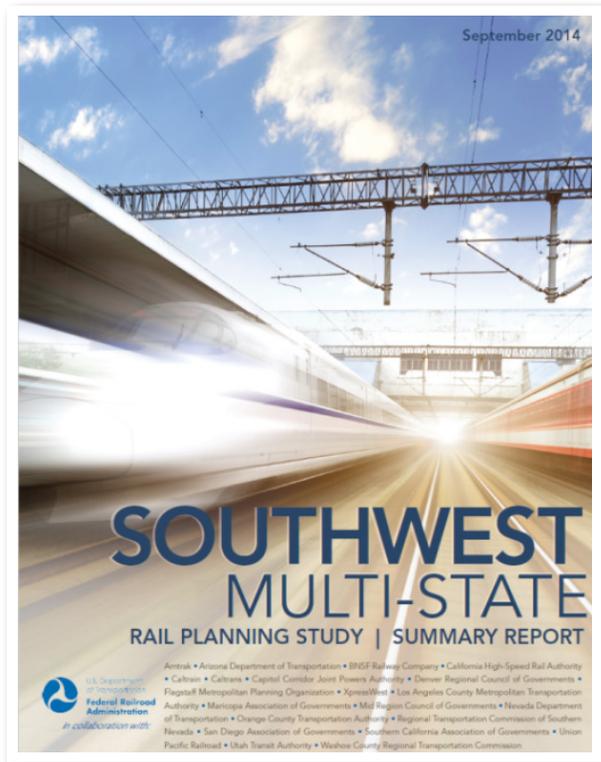
The Southwest Multi-State Rail Planning Study was a 2014 rail planning effort led by FRA. The study is part of a national effort to develop high-performance interstate passenger rail networks through a common preliminary technical vision and strategic planning at the multi-state and mega-regional level.

The study focused on Arizona, California, and Nevada, and parts of Utah, Colorado, and New Mexico, and identified key corridors for future planning. Those recommendations are carried in the Rail Plan, with phased implementation steps the State of California can take to invest in those services, as well as future planning needs to continue to coordinate with stakeholders outside of California.

The Rail Plan shares guiding principles from the FRA study in its efforts to:

- **Support** development of safe, reliable, efficient, and interconnected multimodal travel options.
- **Balance** providing a premier transportation system with the duty to be a responsible steward of public dollars.
- **Consider** factors such as return on investment, cost-effectiveness, and modal alternatives when developing the network.
- **Envision** a preliminary multi-state rail network that supports environmental, social, and economic sustainability.
- **Encourage** cross-state coordination to achieve the most optimal outcomes in network planning.

Specifically, the Rail Plan's 2040 Vision builds on the study's vision for major corridors in California, and interstate connections between Sacramento and Reno and Los Angeles, Las Vegas, and Phoenix. The 2040 Vision also leverages lessons learned from the study; specifically, incorporating a multimodal perspective and recognizing the importance of Federal involvement in multi-state planning. Therefore, the Rail Plan seeks to integrate the Southwest Multi-State Rail Planning Study into existing and ongoing transportation planning efforts. The Rail Plan also includes specific funding and policy support for a Blue Ribbon Panel to organize relevant stakeholders and advance service planning.



Passenger Rail Corridor Investment Plans

A Passenger Rail Corridor Investment Plan (PRCIP), as defined by the FRA, consists of two primary elements: a Service Development Plan, which is focused on passenger rail service planning and alternatives analysis; and a programmatic, corridor-level environmental analysis of rail services being proposed. The PRCIP includes an alternatives analysis, and presents the preferred alternative that best addresses the underlying transportation issues. Completing a PRCIP is a precondition of high-speed and intercity passenger rail Federal investment.

Corridor System Management Plans

Caltrans also provides for the development of Corridor System Management Plans (CSMPs). CSMPs are developed to facilitate the efficient and effective movement of people and goods along California's most congested transportation corridors. CSMPs help Caltrans and its regional planning partners prioritize, implement, and manage multimodal investments. CSMPs are developed by Caltrans in consultation with local stakeholders, and they provide critical insights into rail capacity and intermodal accessibility issues and solutions at key chokepoints throughout California.

Each CSMP presents an analysis of existing and future travel conditions, and proposes traffic management strategies and transportation improvements to maintain and enhance mobility. Analyses encompass state highways, local roadways, transit, and other transportation modes. CSMPs result in a phasing plan of recommended operational improvements, intelligent transportation system strategies, and capacity expansion projects to maintain or improve corridor performance. CSMPs are required for all projects receiving funding from the Corridor Mobility Improvement Account under Proposition 1B^[74] (2006).

1.5.6 Private-Sector Railroad Services, Initiatives, and Plans

Coordination with private-sector railroads was conducted to identify any plans and initiatives relevant to the State rail network. The two Class I (the largest class) railroads operating in California publicly announce their near-term investment plans annually. Most recently, BNSF's 2016 capital plan called for \$4.3 billion in improvements system-wide, of which \$180 million would be allocated to California.^[75] Similarly, UPRR's projected capital plan of \$3.75 billion system-wide included \$121.6 million of track improvements, signal system enhancements, and bridge infrastructure in California.^[76]



74 Proposition 1B, the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006, "authorized the issuance of \$19.93 billion in State general obligation bonds for specific transportation programs intended to relieve congestion, facilitate goods movement, improve air quality, and enhance the safety of the State's transportation system." (CTC, Proposition 1B (2016), accessed 2016).

75 BNSF Railway, BNSF plans \$180 million capital program in California for 2016 (2016), accessed 2016.

76 Union Pacific Railroad, Union Pacific Plans to Invest \$121.6 Million in its California Rail Infrastructure (2016).

1.6 Governance and Funding

This section provides a high-level summary of the governance and funding of the California State rail system, including powers and regulations related to the rail system and rail revenue sources at the Federal, State, and local levels. The latter portions of this section provide an overview of freight rail governance. Chapter 6 lists the funding sources for rail improvements in more detail.

1.6.1 Federal Laws and Powers for Planning, Operating, and Funding Rail Services

The FRA, the Federal Transit Administration (FTA), and the Surface Transportation Board (STB) each play a role in passenger rail governance.

Federal Railroad Administration

From its beginnings in 1966, the FRA has held the primary Federal responsibility for enforcing the safe operation of the national rail network. In subsequent years, the agency's portfolio was expanded to encompass other functions, including overseeing a rail research program and administering Federal grants to Amtrak. More fundamental changes to the FRA's responsibilities came on approval of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA). Historically, the FRA's role was focused primarily on safety; under PRIIA, the agency was entrusted with active management of rail policy development and investment, more akin to FTA's role with public transit. Central to this change has been PRIIA's requirement that FRA oversee comprehensive state rail plans, regional passenger rail planning projects (such as Northeast Corridor Futures), and administration of Federal grant and loan programs for intercity passenger rail with the states, Amtrak, and other rail operators. The recent FAST Act continues and expands on these FRA responsibilities through various funding and policy provisions.

Federal law (49 United States Code [USC] § 22702) and the minimum requirements established by the FRA under that code section govern state rail plans, which are required to be updated every 4 years. This Rail Plan is compliant with Title 49 USC Section 22102, which pertains to a state's eligibility to receive Federal financial assistance. Compliance requires, among other things, an adequate plan for rail transportation in the state, and a suitable process for updating, revising, and modifying that plan. The Rail Plan and periodic updates fulfill this requirement.

Federal Transit Administration

The FTA provides financial and technical assistance to state and local public transit service providers, including commuter railroads. The FTA oversees capital and operating grants to the transit providers, and ensures that grant recipients are managing their programs in accordance with Federal, statutory, and administrative requirements. Under traditional grant agreements, carried forward in the FAST Act as part of the New Starts, Core Capacity, and other similar programs, local stakeholders are typically required to provide a 50 percent local match to receive Federal funds. In this way, the FTA and local project sponsors play a joint role in project development and investment.

Surface Transportation Board

The STB is the Federal economic regulatory body for the railroad industry, and the successor to the Interstate Commerce Commission. The STB settles railroad rate and service disputes, and reviews proposed railroad mergers, acquisitions, abandonments, and new line construction. More recently, it has been assigned responsibility for mediating conflicts between passenger operators (including Amtrak and other intercity and commuter rail operators) and track-host freight railroads. This responsibility includes investigating causes of poor on-time performance (OTP), or other intercity passenger rail service quality deficiencies caused by the operator, the track-host railroad, or the managing entity.

1.6.2 State Laws and Powers for Planning, Operating, and Funding Rail Services

Many California agencies are involved in overseeing rail planning, operating, and funding. Chief among these is the California State Transportation Agency (CalSTA), which was formed in 2013 to bring together the State's multiple transportation-related departments under one agency. CalSTA oversees Caltrans, the California Transportation Commission (CTC), CHSRA, and other departments related to transportation. Under CalSTA, the focus of rail's role in transportation has increased substantially, with HSR and Caltrans now being under one state agency. CalSTA has been designated the State Rail Plan Approval Authority, and Caltrans is responsible for rail planning in the State, including development of the Rail Plan.

The CTC is composed of 11 members appointed by the governor and the California State Legislature.^[77] The CTC is responsible for programing and allocating funds, and advises the Secretary of Transportation and the California State Legislature on issues related to transportation planning and funding.

As the State Department of Transportation, Caltrans is charged with planning and maintaining the State's transportation system. The Caltrans DRMT is responsible for developing the Rail Plan; administering Federal and State capital grant programs, primarily for intercity rail projects; providing oversight and support to State-supported intercity rail services; and managing and procuring State-owned intercity rail equipment and related facilities.

CHSRA is a unique State entity, responsible for planning and implementing the State's long-term HSR vision. CHSRA also is under the jurisdiction of CalSTA, and is separate from Caltrans and the CTC.

Although the State retains many rail funding and planning responsibilities, the passage of SB 45 in 1998 allowed for regional agencies to play a more active role in passenger rail planning and delivery. Today, State-supported intercity rail services are administered by Joint Powers Authorities (JPAs), and

statewide rail planning has evolved toward greater collaboration between State and local agencies.

In 2017, California made a bold commitment to investing in the State's transportation network by passing SB 1. The legislation invests \$5.4 billion a year over the next decade to maintain and improve transportation infrastructure across California. Key among these investments are an estimated \$750 million in new funding for transit agencies as part of the overall funding package to support the State's rail network. SB 1 is an example of the partnership between the legislature, Caltrans, and other stakeholders to deliver the transportation system California depends on.

Laws and Powers for Rail Planning

In accordance with PRIIA,^[78] the State of California must develop a state rail plan to be eligible to receive Federal funding for rail projects. California Government Code Section 14036 requires Caltrans to prepare a California State Rail Plan that generally aligns federal and state requirements. A State Rail Plan was developed in 2013, with this Rail Plan presenting an integrated statewide vision for HSR, intercity rail, and State requirements for the Rail Plan, with some State-specific additions.

Caltrans is designated as the State rail transportation authority to prepare, maintain, coordinate, and administer the Rail Plan. CalSTA is designated to approve the plan, compliant with U.S. Code Title 49 Section 22705.

Today, all State-supported intercity rail routes are managed and administered by regional JPAs consisting of membership from stakeholder jurisdictions and agencies. Intercity Rail Agreements AB 1779 and SB 1225 (2012) authorized Caltrans to enter into interagency transfer agreements (ITAs) for additional intercity rail corridors with respect to the Los Angeles-San Diego-San Luis Obispo Rail Corridor Agency (LOSSAN) and San Joaquin corridors. Among other powers, each JPA is authorized to:

- Make and enter into contracts;
- Own and lease property;
- Manage and build facilities; and
- Incur debts.

77 Of the 11 members, nine are appointed by the governor, one is appointed by the Senate Rules Committee, and one is appointed by the Speaker of the Assembly. There also are two ex officio nonvoting members appointed by the State Senate and State Assembly. These ex officio members are often the chairs of the transportation policy committee in each house.

78 PRIIA, Section 303 (2008).

JPAs are also responsible for fiscal planning through the annual business plans they submit to the State.

The Secretary of Transportation retains the responsibility for overall planning, coordination, and budgeting of the intercity rail services, for the development of a statewide passenger rail network that meets statewide and regional goals and objectives, and for preparing the Interregional Transportation Improvement Program of projects for intercity passenger rail services and statewide transit systems.

On the local level, MPOs and RTPAs must develop RTPs,^[79] which are guiding documents for regional transportation investments, including regional rail investments. The RTPs serve as key inputs to the statewide transportation plans, contributing to both the Rail Plan and the CTP. Emerging corridor agency planning is being conducted by RTPAs in the Coachella Valley and in the Central Valley, and along the Central Coast Corridor. Future RTPs will evolve to incorporate statewide, interregional, mega-regional, and emerging corridor agency plans as well.

Laws and Powers for Rail Funding under PRIIA

States are responsible for sharing the costs of all Amtrak routes of less than 750 miles. The law requires states and Amtrak “to jointly develop a cost-sharing methodology to equitably charge states for state-supported intercity passenger rail service.”^[80] In California, Caltrans now funds all operating expenses for these state-supported routes. Capital expenses are funded by a combination of Federal, State, regional, and private funds. Table 1.4 summarizes California’s State-supported routes – *Pacific Surfliner*, *San Joaquin*, and *Capitol Corridor*. Regional agencies must also meet the performance standards outlined in PRIIA Section 209. Regional commuter trains receive funding from both the Federal and State governments, in addition to local jurisdictions.



79 State legislation, Government Code Section 65080 et seq., of Chapter 2.5 and Federal legislation, USC, Title 23, Sections 134 and 135 et seq.

80 Amtrak, *Amtrak National Facts*, accessed 2016.

Table 1.4: State-Supported Intercity Passenger Rail Agency Roles and Responsibilities⁸¹

	Pacific Surfliner	San Joaquin	Capitol Corridor
Governance			
Management	Los Angeles–San Diego–San Luis Obispo Rail Corridor Agency (LOSSAN) JPA	San Joaquin Joint Powers Authority (SJJPA)	Capitol Corridor Joint Powers Authority (CCJPA)
Operations	Amtrak	Amtrak	Amtrak
Oversight	Caltrans	Caltrans	Caltrans
Funding			
Operating funding	Caltrans	Caltrans	Caltrans
Capital funding	Caltrans and local agencies	Caltrans and local agencies	Caltrans and local agencies
Equipment			
Equipment Ownership	Amtrak and Caltrans	Primarily Caltrans	Primarily Caltrans
Maintenance	Amtrak	Amtrak with oversight from CCJPA and SJJPA	Amtrak with oversight from CCJPA
Track Ownership	UPRR, Ventura County Transportation Commission, Los Angeles County Metropolitan Transportation Authority (LA Metro), BNSF, Orange County Transportation Authority (OCTCA), North County Transit District (NCTD), San Diego Metropolitan Transit System (SDMTS)	UPRR, BNSF	UPRR, Peninsula Corridor Joint Powers Board (PCJPB)

81 Sources:

Amtrak, *About Amtrak California*, accessed 2016;

Caltrans, 2013 California State Rail Plan (2013);

LOSSAN Rail Corridor Agency, Business Plan FY 2016-17 – FY 2017-18, 2016. Accessed 2016.

1.6.3 Local Authority for Funding Rail Improvements

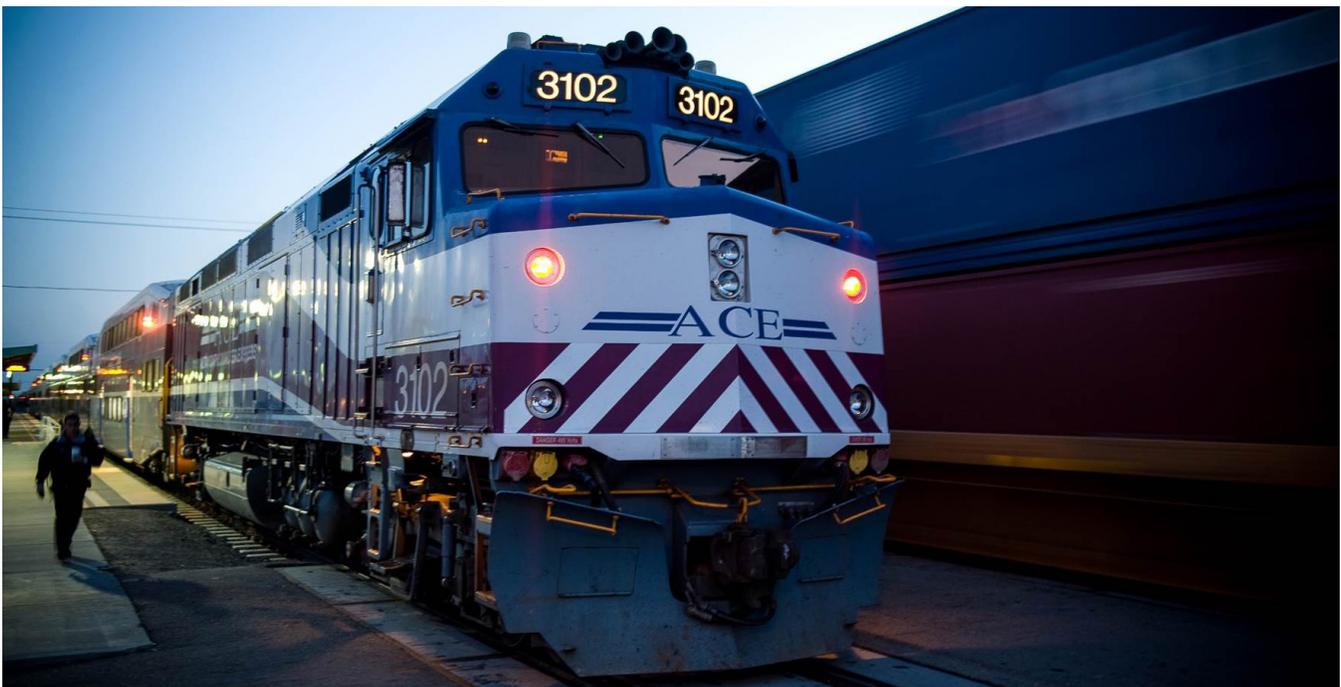
Article XIII B of the State Constitution allows local agencies to enact sales tax measures, subject to voter approval. More than 22 counties have passed local “self-help” tax measures dedicated to transportation funding, including rail enhancements. Local sales taxes typically support local projects, have sunset dates, and are under local control.^[82] Regional rail projects have been included in the expenditure plans. Several regional agencies have successfully passed and/or are considering future ballot measures. In the Bay Area, for example, voters approved a \$3.5 billion bond measure, Measure RR, to upgrade the 44-year-old Bay Area Rapid Transit (BART) system. BART has connections to the Capitol Corridor trains at its Richmond and Oakland Coliseum stations, and to the Caltrain commuter service at its Millbrae station.

During the 2016 elections, a number of local and regional entities took up ballot measures for self-funding transportation improvements, investments in passenger rail and transit expansion, and investments in state of good repair for existing infrastructure assets. For greater detail on 2016 local and regional tax measures, please refer to Chapter 2.

1.6.4 Freight Rail Governance

California’s freight railroads are owned and/or operated by private companies, ranging in size from North America’s two largest Class I railroads, BNSF and UPRR, to short-line railroads such as the Fillmore & Western, Pacific Harbor Line, San Diego & Imperial Valley Railroad, and Yreka Western Railroad, which are often owned by a parent company such as Genesee & Wyoming. Unlike other freight carriers, such as trucking companies and air delivery services that rely on public infrastructure to conduct their operations, most North American railroads operate as integrated systems; they have full responsibility for building and maintaining their infrastructure, in addition to transporting goods.

Federal regulations exempt freight rail operators from many kinds of state and local regulations that might affect other businesses.^[83] For example, states and local governments can set speed limits for trucks on public roads, but cannot set limits on railroad operating speeds. Likewise, only the STB has jurisdiction over the economic regulation of railroads. The Federal government also enforces regulations pertaining to rail employee labor and retirement practices.



82 Martin Wachs, *Devolution as Revolution*, ACCESS, No. 22, spring 2003.

83 Initially established by the Interstate Commerce Act of 1887.

Although freight railroads are largely interstate and regulated by the Federal government, State and local governments have tools at their disposal to influence rail carrier operations, including:

- **Taxation.** States set property and income tax rates for operations that occur in their jurisdictions, which Federal law requires to be done in a nondiscriminatory manner. Rail-owned property that serves a transportation purpose, such as tracks, typically is taxed at a single statewide rate, with proceeds channeled to the communities in which the activity occurs. Active rail-owned property that does not serve a transportation purpose, such as buildings and open space, is subject to local tax levy.
- **Safety programs.** Railroad safety regulation is reserved for the Federal government through the FRA. However, states can opt-in to a program in which inspectors are trained and certified by the FRA to assist in special enforcement activities and other rail safety work. In California, the California Public Utilities Commission (CPUC) employs federally certified inspectors to ensure that railroads comply with both federal and state railroad-safety regulations. The CPUC also issues an annual Railroad Safety Report to the State Legislature. Some states, like California, generate funds to offset the costs of these safety activities through a rail-related fee. In addition, states can impose regulations that supplement those specified by the FRA. However, carriers often view these state-level regulations as a burden, given their need to operate consistently across state boundaries.
- **Freight rail assistance and related economic development initiatives.** States offer a variety of incentives to support railroad line preservation, capacity expansion, and economic development. Incentives include loan guarantees, tax credits, direct investments, and matching grants to leverage private investments by railroads and shippers. Recent financing innovations have included leveraging private funds with public funds, which can reduce the costs assumed by a railroad or other entity, thereby increasing a project's financial rate of return. California's Carl Moyer Memorial Air Quality Standards Attainment Program, which provides for cleaner-than-required engines and equipment, has helped finance purchases of low-emission locomotives at many freight railroads.



- Highway-rail at-grade crossings.** Caltrans and the CPUC administer the Section 130 Grade Crossing Hazard Elimination Program (Section 130 Program), which provides federal funds to local agencies (cities and counties) and railroads to eliminate hazards at existing at-grade public highway-rail crossings. The purpose of the Section 130 Program is to reduce the number, severity, and potential of hazards to motorists, bicyclists, and pedestrians at crossings. The Section 130 Program is a cooperative effort between the Federal Highway Administration (FHWA), Caltrans, railroad companies, local agencies, and the CPUC. The CPUC selects crossings based on their hazard potential. For each crossing, a diagnostic field meeting considers improvements with all interested parties and discusses accident history, vehicle and train volumes, pedestrian needs, geometry, and roadway/rail operations. The CPUC then ranks the crossing improvement projects based on six factors including potential reduction in accidents, pedestrian, bus and hazardous

material vehicle usage, and an accident prediction formula. The CPUC then creates the final priority list annually and provides the list of projects to Caltrans. Caltrans secures funding, administers the funding, and issues contracts to railroads and local agencies to proceed with the improvements. The costs associated with the installation, upgrade, or replacement of an active warning device are usually the responsibility of public agencies and the railroad. The local roadway agencies are responsible for warning devices on the approach to each crossing, interconnections with railroad equipment, and traffic signs and markings. The railroad assumes responsibility for the O&M of the active warning devices at the crossing.

Beyond these specific areas, state regulations that apply to all businesses may also apply to railroads on issues not specifically under Federal jurisdiction. As a result, freight railroads are subject to a range of state-level environmental, safety, engineering standards, and land use regulations.



1.7 Passenger Rail Service Delivery Agencies: Coordination and Background Information

This section describes the agencies that deliver rail services in California. It also describes the coordination process followed in developing the Rail Plan, and summarizes other rail initiatives and plans that are relevant to the Rail Plan.

1.7.1 Service Provider Engagement

Coordination with stakeholder entities is a critical component of the Rail Plan. To ensure that service provider information is accurately reported in this document, JPAs and other service operators throughout the State were engaged to obtain operating and financial data; information on upcoming projects, plans, and service changes; and information on any recent or planned changes to route administration and service delivery.

Caltrans convened a Stakeholder Advisory Committee (SAC) to provide input to the development of the Rail Plan. The SAC “includes representatives from diverse groups of passenger rail operators, planning agencies, freight rail interests, Tribal Nations, private railroads, ports, transit operators, and neighboring states.” Several advocacy groups were also invited to participate on the SAC.^[84]

1.7.2 Relevant Rail Initiatives and Plans

In addition to the Federal, State, and regional planning activities, various initiatives, plans, and studies developed directly by the service providers and stakeholder agencies themselves were reviewed to inform the development of this Rail Plan, and ensure that it aligns with local planning activities. These specific plans are detailed in Chapter 4.

1.7.3 Passenger Service Providers

This section summarizes institutional and strategic arrangements available to increase coordination between rail services in the implementation of the 2040 Vision. Examples of arrangements between separate rail agencies, between rail agencies and other bodies of government, and between rail agencies and the private sector in place or available to provide service to passengers are discussed.

84 Caltrans, 2018 *California State Rail Plan: Stakeholder Advisory Committee*, accessed 2016.

High-Speed Rail: California High-Speed Rail Authority

CHSRA was formed in 1996^[85] to initiate HSR planning and implementation in the State. CHSRA maintains its own board,^[86] and must submit a business plan to the California State Legislature every 2 years.^[87] The 2018 Business Plan calls for initial segments between San Francisco and Gilroy via San Jose (Silicon Valley) and between Madera and Bakersfield (Central Valley), with service opening by 2027. The larger Phase 1 of the HSR corridor is planned to run from San Francisco to the Los Angeles basin in less than 3 hours, with top speeds exceeding 200 miles per hour (mph). Phase 2 would then extend the system to Sacramento, the Inland Empire, and San Diego.^[88]

Intercity Rail: Long-Distance Routes

Amtrak operates four long-distance routes serving portions of California:

- The *Coast Starlight*, from Los Angeles to Seattle
- The *California Zephyr*, from Emeryville to Chicago
- The *Southwest Chief*, from Los Angeles to Chicago
- The *Sunset Limited*, from Los Angeles to New Orleans

These routes are funded through Amtrak’s Federal appropriations.

85 Pursuant to SB 1420 (1996).

86 The CHSRA Board of Directors consists of nine members; of these, five are appointed by the governor, two are appointed by the Senate Committee on rules, and two are appointed by the Speaker of the Assembly.

87 As outlined in AB 528 (Chapter 237, Statutes of 2013) and SB 1029 (Budget Act of 2012-2013).

88 CHSRA, *Business Plan* (2016).

Intercity Rail: State-Supported Intercity Passenger Rail Routes

The State is responsible for funding the three in-State Amtrak-operated rail services. These “State-supported” routes and their major stations are:

- The *Pacific Surfliner*, serving Sacramento, San Luis Obispo, Santa Barbara, Los Angeles, Anaheim, Santa Ana, Oceanside, and San Diego
- The *San Joaquin*, serving Oakland, Richmond, Martinez, Stockton, Modesto, Madera, Fresno, and Bakersfield
- The *Capitol Corridor*, serving San Jose, Oakland, Richmond, Martinez, Davis, Sacramento, and Auburn

These intercity routes are distinct from local commuter rail services in that they serve longer-distance travelers in addition to daily commuters.

Since 2015, all three lines are managed by regional JPAs, which have responsibility for planning and administration. Table 1.4 lists the roles and responsibilities of State-supported intercity passenger rail agencies.

Commuter Rail Service Providers

In addition to the Amtrak-operated, JPA-administered, and State-supported routes, several regional commuter systems serve the metropolitan areas of the San Francisco Bay Area, Los Angeles, and San Diego. These commuter rail services are often overseen by their own JPAs, composed of representatives from their rail service area. Commuter rail services support multimodal transportation options, and their connections to longer-distance rail facilitate travel to statewide destinations. Chapter 2 summarizes California’s commuter rail services, routes, and administrators.

Intergovernmental Coordination between Service Providers

County transportation agencies, regional commissions, JPAs, regional passenger rail agencies, and privately owned freight railroads play important roles in the delivery of passenger and freight rail services in California. Together, these agencies support statewide planning goals through planning, funding, and provision of rail services. The Rail Plan’s integrated passenger rail service will improve the integration through coordinated transfers and better collaboration between service delivery agencies.

This section highlights the agencies primarily responsible for service delivery by route distance. Chapter 2.1 discusses the services in greater detail.

A JPA is a special entity, consisting of two or more government agencies that jointly exercise power over a shared service across relevant regions. JPAs have been established throughout California to organize and manage passenger rail service across jurisdictional and geographic boundaries. JPAs have proven to be useful in scaling the provision of rail service across governmental geographies, while maintaining the benefits of local knowledge of the markets being served. As the State moves forward to integrate more service across more regions, such organizations will become even more important.

Intercity and commuter rail services are currently provided by the following eight JPAs, described in detail in Chapter 2:

- Capitol Corridor Joint Powers Authority (CCJPA)
- Los Angeles-San Diego-San Luis Obispo Rail Corridor Agency (LOSSAN)
- San Joaquin Joint Powers Authority (SJJPA)
- Peninsula Corridor Joint Powers Board (PCJPB)
- Southern California Regional Rail Authority (SCRRA)
- San Joaquin Regional Rail Commission (SJRRC)
- North County Transit District (NCTD) (COASTER)
- Sonoma-Marín Area Rail Transit (SMART) District

Intergovernmental Coordination between Service Providers and Local Government

As relates to station area planning, successful intergovernmental partnerships are crucial to effective TOD. Urban design, consistent zoning, and local service integration are all generally outside the purview of rail service providers, but are still important to the overall success of the integrated network. Partnerships between service providers and local governments, especially in regard to land use and station development, will be mutually beneficial in terms of maximizing the value of the rail service, the value of local real estate, and return on investment of local dollars.

The Salesforce Transit Center (also known as the Transbay Transit Center) project provides an example of such a partnership. The Transbay JPA was created to plan and construct the multimodal HSR terminal in downtown San Francisco. The mega-project is an ongoing collaboration between CHSRA, PCJPB, the City of San Francisco, San Francisco Municipal Transportation Agency (SFMTA), BART, and multiple public bus services. When complete, integrated services and timed connections will be available for rail services traveling throughout the State.



1.7.4 Freight Providers

Freight Rail Services and Intermodal Connections

California's freight railroad system supports industries and consumers, and links the State with other geographic markets. Freight railroads are classified by size. BNSF and UPRR are the only Class I railroads in the State, and handle a majority of the State's tonnage. California has no Class II (i.e., regional) railroads, and has 27 active Class III (i.e., short-line) railroads. Chapter 2 discusses the freight rail system and ports in greater detail.

Intermodal rail terminals—locations where containers and bulk cargo are transferred from rail to truck or rail to ship, and vice versa—help link the freight rail network with the State's overall multimodal system. Most international cargo is handled at intermodal terminals at California's three container ports (referred to as on-dock intermodal terminals) or at locations within a few miles of the ports (referred to as near-dock terminals). Domestic cargo and some international cargo are handled at off-dock intermodal terminals. California is home to three major container ports: POLA and POLB, collectively known as the San Pedro Bay Ports, and the Port of Oakland.

As the intermodal market has grown for both international and domestic cargo, both Class I railroads and the ports have identified the need for new or expanded terminals near the San Pedro Bay ports and the Port of Oakland. However, the recent slowdown in rail traffic and difficulties in obtaining the necessary approvals have greatly slowed the progress of these initiatives. Nevertheless, the projected long-term growth in traffic through these ports will require increased capacity in rail intermodal terminals in the future.

Private-Sector Involvement

Currently, intercity services in California are provided by agreements with Class I freight railroad operators (i.e., BNSF and UPRR). These agreements may be orchestrated through Amtrak, which has a nationwide access agreement, or by public railroad operators (e.g., ACE contracts directly with UPRR). Private contract service providers also operate trains through agreement with various operators throughout the state. Most of these arrangements essentially involve provision of a specified service for a fee.

In addition to coordination among government entities, innovative partnerships will be needed to integrate rail services with private entities. Such partnerships would include both private operations of public rail services, and coordination with private-sector providers of nonrail connecting services, such as airlines, rideshare operators, and private bus operators.

Although such models are common in Europe and Asia, private rail operators are less familiar in the United States. These agreements can take the form of private-sector firms competing to operate government-owned services; or private concessions and public infrastructure for set periods of time and agreed costs. When managed properly, they can be successful tools for managing long-term costs and risk, while ensuring responsive service to passengers.



Several public rail operators, such as ACE, Caltrain, and COASTER, are operated by a private entity that provides on-board conductor and engineer staff, dispatch, and maintenance. Although the infrastructure and rolling stock are publicly owned, their stewardship is managed privately for a set contract period. At the end of the period, these functions can either revert to the public entity, or be put back on the marketplace in whole or in part in a new contract offering, at the public entity's discretion. Such an arrangement provides flexible opportunities to provide the best service to customers at the lowest cost, while minimizing risk.

Beyond the provision of rail services, private-sector partnerships can also work to integrate wider sectors of the transportation industry to extend the reach of rail service to more customers. This can take a variety of forms, many of which are already in place, and are described in detail in Chapter 3. Caltrans defines a public-private partnership (P3) as "a comprehensive development lease agreement formed between public and private sector partners that allows for more private sector participation than is seen in the conventional or traditional project delivery method, like design bid build, that is typically used by the Department to deliver a project."⁸⁹ It is anticipated that use of P3s and agreements will increase as California implements its network integration.

1.7.5 Section 22102 Compliance Statement

Compliance requires, among other things, an adequate plan for rail transportation in the state, and a suitable process for updating, revising, and modifying that plan. The Rail Plan and periodic updates fulfill this requirement.

89 Caltrans Public-Private Partnership Program Guide, January 2013. http://www.dot.ca.gov/p3/documents/p3_guide.pdf

1.8 Conclusion

To adequately support its projected population growth, economic goals, and climate change responsibilities, California must develop its railroads, highways, ports, airports, local assets, and land use practices to find ever-greater efficiency in investment, economic output, energy use, and user capacity. This development will require a redirection of legacy planning and investment solutions; and new ways of strategizing investments, and adapting and leveraging the latest technological solutions.

Modern, integrated rail service must play an increasingly prominent role in the statewide multimodal transportation system, and the Rail Plan

provides a framework for fulfilling this challenge. The advent of new technologies, implementation of HSR and advanced train control systems, groundbreaking policies for reining in GHG emissions, continued population and economic growth, and other factors will influence and drive development of the rail network in California over the next several decades. The Rail Plan seeks to integrate and optimize the State rail network as a core component of the multimodal transportation system.

Chapter 2 examines the existing rail infrastructure and funding landscape in greater detail, projecting future trends and changes, and identifying needs and opportunities.

