



2

Existing Rail System

California's rail system is and will continue to be critically important to a statewide, multimodal transportation system that is efficient, flexible, and sustainable for all persons and markets. The existing rail system moves people and goods throughout the state through a range of infrastructure and services. Planning for rail is often more complicated than planning for roads or highways because the State, in large part, does not own the infrastructure. However, understanding the delicate dynamics of rail operations, service providers, funding mechanisms, and future trends and challenges is imperative for assessing the future possibilities of rail in California.

For example, 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 foster better collaboration between service delivery agencies.

Chapter 2 inventories the statewide rail system, including the existing passenger rail system, which is composed of Amtrak long-distance and State-supported intercity passenger trains and locally supported commuter and urban rail services, with connections to other modes of transportation. The proposed passenger rail system includes HSR and many other improvements to better connect the rail system and create a seamless, door-to-door travel experience for passengers. Additionally, freight railroads and facilities are vital to California's goods movement, and must substantially grow in their carrying capacity to meet broader economic and societal trends and challenges.

The Rail Plan builds on the existing statewide rail system, connected by HSR, to extend the impact of the rail system in achieving integrated service offerings between diverse markets. The coordination among various existing rail and transit service providers is critical to implementing a fully integrated system. The Rail Plan also protects and enhances the freight-carrying capacity of the State's existing freight rail providers, often recommending investments that reduce conflicts between freight and passenger trains. This chapter details how strategic investment and planning decisions help the State to maintain the existing rail capacity, and build on past efforts to move California's rail system forward.

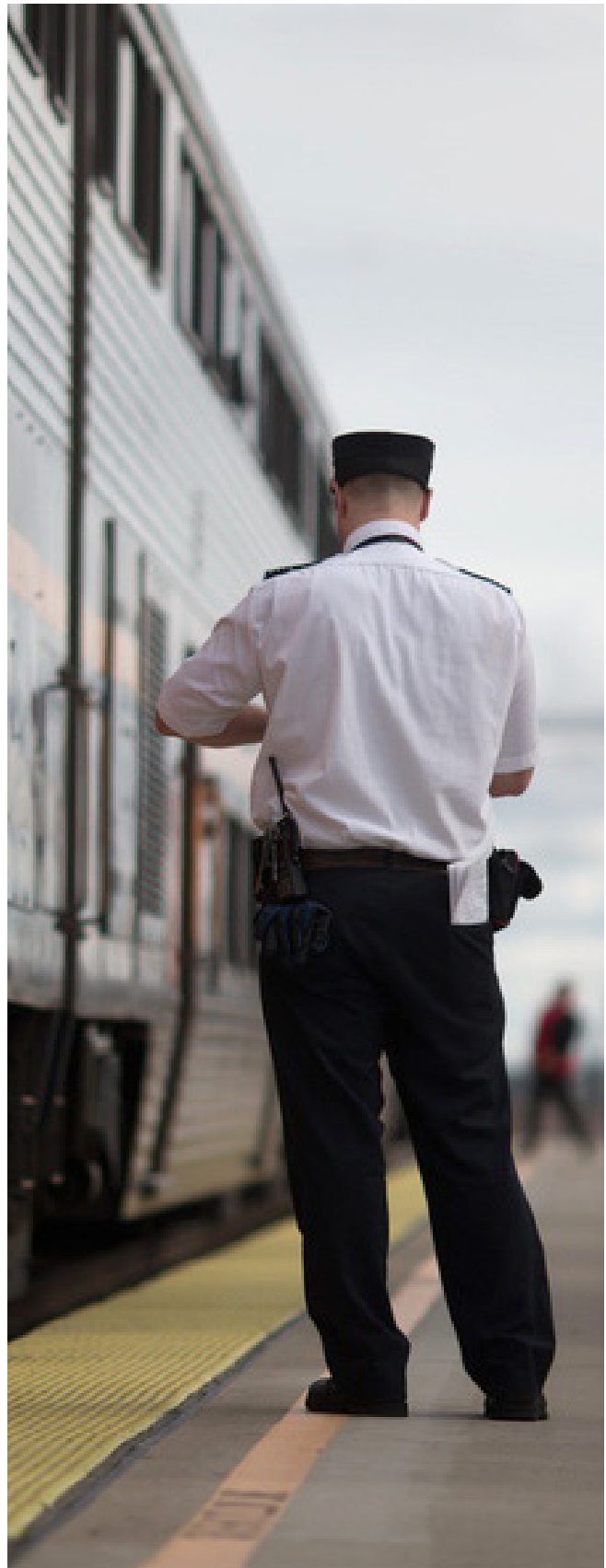




Exhibit 2.1: California Intercity and Commuter Rail Network (Including Connecting Bus Service)

2.1 Description and Inventory

2.1.1 Existing Passenger Rail Lines, Corridors, and Services

Expanding and improving an integrated statewide rail system requires coordination between service providers, as well as between service providers and local governments. This section summarizes existing passenger rail service providers in California, with a detailed explanation of the three categories of passenger rail services operating in California today:

1. Intercity passenger rail services;
2. Commuter rail services in metropolitan regions or between adjacent regions; and
3. Urban passenger rail transit systems serving metropolitan areas.

Intercity Passenger Rail Services

Intercity passenger rail provides transportation between metropolitan areas, to rural areas, and to points beyond California's borders. Amtrak operates all intercity rail services in the state. California's intercity rail services can be divided into two groups: Amtrak long-distance routes, which are funded by Amtrak and serve both California and interstate markets; and State-supported routes that serve California travel markets. Exhibit 2.1 maps California's State-supported and long-distance intercity rail routes.



Exhibit 2.2: California Intercity Routes

Amtrak Long-Distance Routes^[90]

These are the multi-state Amtrak long-distance passenger routes serving California.

- **California Zephyr** (Emeryville – Sacramento – Reno – Denver – Chicago). The *California Zephyr* provides daily round-trip regional service in the Emeryville-Sacramento-Reno corridor. Extra coaches are often operated on this portion of the route to handle heavy loads to and from Reno. Connecting buses link Emeryville with San Francisco. A stop in Truckee serves Lake Tahoe and nearby Sierra Nevada ski areas. En route to Chicago, the *California Zephyr* also serves Salt Lake City, Denver, and Omaha. The route served 417,322 passengers in federal fiscal year (FFY) 2016 across its entire interstate route.
- **Coast Starlight** (Los Angeles – Oakland – Sacramento – Portland – Seattle). The *Coast Starlight's* daily round trip is the second-most popular long-distance train in the Amtrak system. A substantial portion of the route's ridership is generated by intrastate California travel. The route provides the only rail service north from Sacramento to Redding and the Pacific Northwest, and the only one-seat rail service from the Bay Area to Los Angeles. Connections with the *Pacific Surfliner* at Los Angeles provide access to San Diego, and connections with the *San Joaquins* at Sacramento and Martinez provide access to the Central Valley. Portland and Seattle are major stops to the north. The route served 453,131 passengers in FFY 2016.
- **Sunset Limited** (Los Angeles – San Antonio – New Orleans). The *Sunset Limited*, originating and terminating in Los Angeles, operates 3 days per week in each direction and is the only rail service serving Palm Springs. It continues east, connecting California to Tucson, El Paso, San Antonio, Houston, and New Orleans. The *Texas Eagle*, which links Chicago with San Antonio, carries through-cars to and from the *Sunset Limited*. The route served 98,079 passengers in FFY 2016; in addition, a portion of the 306,321 passengers in FFY 2016 on the *Texas Eagle* had an endpoint of their journey in California.
- **Southwest Chief** (Los Angeles – Albuquerque – Kansas City – Chicago). The daily round-trip *Southwest Chief* provides the only rail service in California between Los Angeles and Victorville, Barstow, and Needles to the east. Beyond California, major stops include Flagstaff (Grand Canyon), Albuquerque, Kansas City, and Chicago. The route served 364,748 passengers in FFY 2016.



90 Ridership information from: Amtrak, Amtrak FY15 Ridership and Revenue, 2015, accessed 2016.

State-Supported Services

State-supported routes are services funded by the State, administered by JPAs, and operated by Amtrak under contract with each JPA. Amtrak also provides maintenance on the equipment, some of which is owned by the State and some by Amtrak. The State funds the services and provides oversight, including overall planning, coordinating, and budgeting. This ensures that the State-supported system, including the Thruway bus network, is integrated internally with the rest of the commuter and planned HSR Systems, as well as the transit system in California, with the goal of an integrated and seamless system.

In FY 2017, the three State-supported corridor services were ranked second, third, and sixth in ridership across all Amtrak routes nationally, behind only the Northeast Corridor (NEC: Boston to Washington D.C.). California State-supported ridership accounted for more than 38 percent of total national State-supported ridership,^[91] and three of the top ten busiest Amtrak stations were in California (Los Angeles, Sacramento, and San Diego^[92]).

Section 2.1.2 provides data on State-supported intercity rail performance from FFY 2008-2015.

Appendix A includes information on State-supported route ownership and track characteristics, the Amtrak Thruway bus system, historical State-supported route performance, and connecting rail services; and includes maps of the State-supported intercity rail routes, along with their supporting Amtrak Thruway bus routes. Table 2.1 shows Intercity Passenger Rail Historical Ridership.

Table 2.1: Intercity Passenger Rail Historical Ridership

Fiscal Year	Surfliner	San Joaquin	Capitol Corridor	Total Intercity Rail Ridership	Thruway Bus Ridership
2005	2,454,396	743,245	1,260,249	4,457,890	879,418
2006	2,655,490	801,242	1,273,088	4,729,820	956,661
2007	2,685,194	789,641	1,450,069	4,924,904	880,678
2008	2,835,132	894,346	1,693,580	5,423,058	1,068,190
2009	2,696,951	958,946	1,599,625	5,255,522	950,911
2010	2,614,777	967,437	1,580,619	5,162,833	991,548
2011	2,746,320	1,032,579	1,708,618	5,487,517	1,121,210
2012	2,664,935	1,133,654	1,746,397	5,544,986	1,189,359
2013	2,689,465	1,195,898	1,701,185	5,586,548	1,184,752
2014	2,673,170	1,202,624	1,419,084	5,294,878	1,126,985
2015	2,827,134	1,181,639	1,474,873	5,483,646	1,135,535
2016	2,924,117	1,135,424	1,560,814	5,620,355	1,118,625

91 Amtrak, FY '17 Ridership Revenue Fact Sheet

92 CATC, 2016 Annual Report Final, 2016.

Pacific Surfliner (San Luis Obispo – Los Angeles – San Diego)

The *Pacific Surfliner* operates along the Southern California coast; it is the second-busiest Amtrak route in the nation, serving 2,924,117 passengers in FFY 2016.

Route Description. The *Pacific Surfliner* extends 351 route-miles, serving 29 stations between San Luis Obispo and San Diego, including Los Angeles. There are 17 stations between San Luis Obispo and Los Angeles, and 12 south of Los Angeles. UPRR owns 175 miles of line between San Luis Obispo and Moorpark. Most of the route from Moorpark to San Diego is publicly owned by regional and local agencies, except the 22-mile segment between Redondo Junction in Los Angeles and Fullerton, which is owned by BNSF.

Effective November 6, 2016, the *Pacific Surfliner* route features 12 daily round trips between San Diego and Los Angeles. Five trips extend north to Santa Barbara and Goleta, with two of these trips extending further north to San Luis Obispo. Dedicated Amtrak Thruway bus connections provide service to and from San Luis Obispo for rail passengers making connections in Santa Barbara on trains that terminate in Goleta. Bus routes connect with many of the *Pacific Surfliner* stops, providing service to a large network of destinations, including Bakersfield, San Jose, and other Bay Area stops; various communities on the Central Coast; Indio; San Pedro; Hemet; Las Vegas; and many points between.

Travel Times. Current San Diego to Los Angeles travel times average 2 hours and 51 minutes. Los Angeles to Santa Barbara travel times average 2 hours and 37 minutes in the northbound direction, and 2 hours and 53 minutes in the southbound direction. Los Angeles to San Luis Obispo travel times average 5 hours and 28 minutes in both directions. Between Los Angeles and San Diego, only portions of the 70-mile plus segment between Santa Ana and Sorrento Valley have a maximum authorized speed of 90 mph.

Proposed Improvement Strategies. A major improvement strategy in the LOSSAN Corridor is to address capacity needs, including future studies, as well as grant funding for the lease of rolling stock equipment. Additionally, grade-separation efforts, such as Rosecrans-Marquardt, will contribute to increased train frequencies. Frequency expansion, including peak-hour services between Los Angeles and Santa Barbara, will help improve corridor performance and provide travel-time savings. Beyond capacity improvements, further business class enhancements will provide improved travel opportunities for riders.



San Joaquins (Bay Area/Sacramento – Stockton – Bakersfield)

The *San Joaquins* provides service from the San Francisco Bay Area and Sacramento through the San Joaquin Valley to Bakersfield. It is the sixth-busiest Amtrak route in the nation in FFY 2017, with 1,122,301 passengers.^[93]

Route Description. The *San Joaquins* route extends 316 route-miles between Oakland and Bakersfield, with 13 intermediate stops. In addition, the Stockton-Sacramento segment of the route extends 49 miles, with one intermediate stop. BNSF primarily owns the right-of-way (Port Chicago-Bakersfield); however, UPRR owns 39 miles between Oakland and Port Chicago and 49 miles between Stockton and Sacramento.

Seven daily round-trip trains currently serve the *San Joaquins* route, of which five run between Oakland and Bakersfield and two run between Sacramento and Bakersfield. All trains between Stockton and Bakersfield operate on the same tracks. Connecting Thruway buses run between Stockton and Sacramento for trains serving Oakland. For trains serving Sacramento, connecting buses operate between Stockton, Oakland, and San Francisco. All trains connect to a bus from Bakersfield to Los Angeles. In addition, there is an extensive network of connecting buses north to Redding and McKinville; west to San Jose and to the Central

Coast; and east to many points, including Las Vegas, Coachella Valley, Reno, and Yosemite. Altogether, 55 percent of riders use one or more buses for a portion of their trip.

Travel Times. The average travel time in the northbound direction between Bakersfield and Oakland is 6 hours and 12 minutes, and 5 hours and 18 minutes between Bakersfield and Sacramento. The average southbound travel time is 6 hours and 10 minutes between Oakland and Bakersfield, and 5 hours and 20 minutes between Sacramento and Bakersfield.

Proposed Improvement Strategies. The delivery of new locomotives to the corridor will provide major environmental improvements to many areas particularly challenged by air quality. As an example of the progress already being made, on May 7, 2018, the new “Morning Express” began providing early morning service from Fresno to Sacramento to serve the business commute market in the Central Valley. Additionally, certain stations along this corridor have disjointed land uses that create access constraints. Rail access issues are often overlooked, but are crucial to system connectivity and seamlessness of the travel experience for the rider, resulting in higher ridership. Continued study and infrastructure investment are necessary to improve some access issues, particularly to link intercity rail services to regional rail and transit.



93 SJJPA 2017 Business Plan.

Capitol Corridor
(Roseville/Auburn – Sacramento – Oakland – San Jose)

The *Capitol Corridor* provides service between San Jose, the East Bay, and the Sacramento region. It is the third-busiest Amtrak route in the nation. More than 1.5 million passengers traveled on this route in FFY 2016.

Route Description. The *Capitol Corridor* extends 169 route-miles and has seven daily round trips between Oakland and San Jose, 15 weekday round trips between Sacramento and Oakland (11 on weekends), and one daily round trip extending from Sacramento to Auburn. UPRR owns most of the right-of way (166 miles), and PCJPB owns 3 miles between Santa Clara and San Jose. The route has a number of Thruway bus connections. Trains at Emeryville have a bus connection to and from San Francisco. Bus routes connect the *Capitol Corridor* to a large network of destinations, including north to Redding and McKinleyville; south to Stockton, Santa Cruz and the Central Coast; and east to Stateline and Reno.

Travel Times. Current Sacramento-Oakland travel times average 2 hours and 1 minute in the eastbound direction, and 1 hour and 54 minutes in the westbound direction. Oakland-San Jose travel times average 1 hour and 4 minutes in the eastbound direction, and 1 hour and 18 minutes in the westbound direction. The Auburn-Sacramento trip averages 1 hour and 3 minutes in both directions.

Proposed Improvement Strategies. The *Capitol Corridor* was awarded \$4.62 million for its Travel Time Reduction project to improve track and signal systems to increase safety and speeds along the corridor. Further improvements include service to additional markets and bicycle access and storage.



Amtrak California Thruway Bus Network

An extensive network of dedicated *Amtrak Thruway* buses supports intercity passenger rail by providing dedicated connecting service with guaranteed seating to markets without direct passenger rail service. To ride the bus, a passenger must purchase an integrated train and bus ticket. Caltrans is conducting a “California Intercity Bus Study” and will recommend strategies and improvements to further integrate the statewide rail and transit network. Appendix A describes the bus network in greater detail.

Table 2.2: Amtrak Thruway Bus Historical Ridership^[94]

Fiscal Year	Thruway Bus Ridership
2005	879,418
2006	956,661
2007	880,678
2008	1,068,190
2009	950,911
2010	991,548
2011	1,121,210
2012	1,189,359
2013	1,184,752
2014	1,126,985
2015	1,135,535
2016	1,118,625



94 Source: Amtrak Performance Reports, based on FFY.

Intercity Rail: Service Providers and Roles and Responsibilities

A JPA is a special entity consisting of two or more government agencies jointly exercising power over a shared service. JPAs have proven useful in scaling the provision of rail service across governmental geographies, while maintaining the benefits of local knowledge of the market being served. Three JPAs have been established in California to organize and manage intercity passenger rail service across jurisdictional and geographic boundaries; they are described in the sections below.

The State funds the services and provides oversight, including overall planning, coordinating, and budgeting, to ensure that the State-supported rail and Thruway bus system are integrated internally and with the rest of the commuter and planned HSR Systems, as well as the transit systems—with the goal of a statewide integrated and seamless system.

Appendix A describes State-supported intercity passenger rail agency roles and responsibilities.

Capitol Corridor Joint Powers Authority



The CCJPA was the first agency that took over administration of intercity operations from Caltrans under the provisions of SB 457. The CCJPA board consists of two representatives from each of the eight counties along the 150-plus-

mile route between Auburn and San Jose (Placer, Sacramento, Yolo, Solano, Contra Costa, San Francisco, Alameda, and Santa Clara Counties), which are represented by Placer County Transportation Planning Agency, Sacramento Regional Transit District (RT), San Francisco BART District, Santa Clara Valley Transportation Authority (SCVTA), Solano Transportation Authority, and Yolo County Transportation District. BART provides day-to-day management support to the CCJPA, under contract. The CCJPA is also supported by the MTC and the Sacramento Area Council of Governments. The majority of the equipment on the route is owned by the State. Amtrak maintains the equipment, with oversight by the CCJPA.

Los Angeles–San Diego–San Luis Obispo Rail Corridor Agency



Effective July 1, 2015, administrative and oversight responsibility passed from Caltrans to the LOSSAN JPA under the provisions of an ITA between the State and LOSSAN that was completed pursuant to the provisions of SB 1225 (2012). The LOSSAN Board of Directors is composed of current and former elected officials representing rail owners, operators, and planning agencies along Amtrak's *Pacific Surfliner* corridor between San Diego, Los Angeles, and San Luis Obispo. OCTA serves as the managing agency on behalf of the LOSSAN JPA. The *Pacific Surfliner* uses a combination of State- and Amtrak-owned equipment on the route. Amtrak owns the locomotives and 40 bi-level cars, as well as additional equipment leased from Amtrak; and the State owns 10 cars. Amtrak maintains the equipment.

San Joaquin Joint Powers Authority



San Joaquin
Joint Powers Authority

The SJJPA took over management and administration of the *San Joaquins* service from the State on July 1, 2015, under the provisions of an ITA between the State and the SJJPA, pursuant to AB 1779 (2012). The ten Member Agencies that make up the SJJPA are

Alameda County, Contra Costa Transportation Authority, Fresno Council of Governments, Kings County Association of Governments, Madera County Transportation Commission, Merced County Association of Governments, RT, SJRRRC, Stanislaus Council of Governments, and Tulare County Association of Governments (TCAG). The SJRRRC is the Managing Agency for the SJJPA. The majority of the equipment on the route is owned by the State. Amtrak maintains the equipment, with oversight of equipment maintenance by the SJJPA and the CCJPA, working in partnership with Caltrans.

Intercity Rail: Emerging Corridors

Regional agencies and jurisdictions across California are currently engaged in coordinated planning with the State and rail operators to develop new passenger rail corridors and services, which provide opportunities to develop intercity and regional rail connections to a statewide passenger system.

Coachella Valley – San Geronio Pass Rail Corridor

The Riverside County Transportation Commission (RCTC) has been studying passenger service in a 141-mile rail corridor between Los Angeles Union Station (LAUS) and Indio, California, since 1991. Passenger service in this corridor is being proposed to provide a safe, reliable, and convenient intercity passenger rail travel option to address mobility challenges that are likely to expand as growth increases in population, employment, and tourism.

RCTC, in coordination with the FRA, completed an Alternatives Analysis in 2016 that evaluated several alternatives for new intercity passenger rail service between Los Angeles and Indio. RCTC is preparing a Passenger Rail Corridor Investment Plan, including a Program Environmental Impact Statement (EIS)/ Program Environmental Impact Report (EIR) for a twice-daily round-trip service. This EIS/EIR will evaluate and conceptualize the way service will operate in the corridor, and will determine what infrastructure improvements would be needed to accommodate the new service.



Central Coast Rail

The Coast Route between Los Angeles, Santa Barbara, San Luis Obispo, Salinas, and San Jose is defined as a state intercity passenger rail corridor in California Government Code. Regional agencies and jurisdictions along this route have been coordinating with Caltrans and rail operators, both independently and through a Coast Rail Coordinating Council, to develop proposals for expanding passenger rail service in the Central Coast counties.

Rail Extension to Salinas

The Transportation Agency for Monterey County (TAMC) is planning an extension of passenger rail service to Salinas, which has been conceived as either an extension of Caltrain commuter rail service or Capitol Corridor intercity service, including two daily round trips that would begin with stops in San Jose, Gilroy, Pajaro/Watsonville, Castroville, and Salinas. TAMC is proceeding with a reduced “Kick Start” project, using available state funds that would accommodate an initial service with station and track improvements at Gilroy and Salinas. TAMC is in the process of undertaking National Environmental Policy Act (NEPA) environmental review of the San Jose to Salinas segment, undertaking design work for capital improvements, purchasing right-of-way, and coordinating with the State and rail operators on a strategy for implementing service.



Monterey Branch Line.

TAMC purchased the Monterey Branch Line between Castroville and Monterey from UPRR in 2003 with the intention of reestablishing intercity passenger rail service between the San Francisco Bay Area and the Monterey Peninsula. TAMC subsequently adopted a preferred alternative for FTA Small Starts funding, identifying a light-rail commuter service on a segment between Marina and Monterey with a future connection to intercity passenger rail service at Castroville. Due to a lack of funding, though, this project has not progressed beyond the environmental stage. The Branch Line is currently being planned to include a commuter transit service guideway, and remains an opportunity for providing a future passenger rail service connection for popular tourist destinations on the Monterey Peninsula.

Santa Cruz Branch Line.

The Santa Cruz County Regional Transportation Commission (SCCRTC) purchased the Santa Cruz Branch Line between Watsonville and Davenport, which is currently an active freight short line serving local industries. SCCRTC completed a feasibility study of passenger service alternatives in 2015, including various options for providing commuter service between Santa Cruz and Watsonville, and connections to intercity passenger service at Pajaro/Watsonville, providing a reliable travel option in the congested Highway 1 corridor.



Coast Route Service North of San Luis Obispo.

The San Luis Obispo Council of Governments (SLOCOG), in coordination with its Central Coast Coordinating Council Partner agencies, has planned a once-daily intercity passenger rail service, referred to as the *Coast Daylight*. This service has been conceived as an extension of *Pacific Surfliner* service north of San Luis Obispo to San Jose or San Francisco, providing an additional passenger rail frequency on the Coast Route, with proposed stops in Paso Robles, King City, Soledad, Salinas, Castroville, Pajaro/Watsonville, and San Jose. Additional service in the Coast Route will provide passenger rail access to the State-supported rail network, including access to the Fort Hunter Liggett military installation outside of King City.

SLOCOG completed an EIS/EIR for the Coast Route in San Luis Obispo and Monterey Counties in 2015. This document encompassed a broad range of improvements identified in the Coast Corridor Service Development Plan completed by Caltrans in 2013, and in previous plans and studies.

Central Valley: Tulare Cross Valley Corridor

TCAG is preparing a Cross Valley Corridor Plan to improve transportation system connections and mobility by developing a short-line rail corridor between Huron and Porterville, a corridor that includes the proposed Kings/Tulare HSR Station and planned connections to the California HSR system. This corridor is planned to utilize existing rail right-of-way to provide passenger rail access to population centers in Kings-Tulare Counties, including the Lemoore Naval Air Station facility.



Xpress West and High Desert Corridor

This region encompasses the privately developed HSR route for service to Las Vegas, connecting to Victorville, and eventually to Palmdale. The developer of the Victorville to Palmdale segment (known as the High Desert Corridor [HDC]) has not been finalized and could be either public or private sector.

HSR to Arizona

The State envisions that a HSR line will eventually run between Phoenix and Los Angeles, serving the Coachella Valley. Caltrans has engaged with the Arizona Department of Transportation and the FRA to study and plan for service in this corridor. One result of the Southwest Multi-State Rail Planning Study was a recommendation for a Blue Ribbon Commission to guide the Los Angeles to Phoenix HSR planning. The Commission would engage a technical committee that will include planning and analysis from MPOs and the State to ensure network integration. The 2018 Rail Plan supports HSR to Arizona service with two actions: identifying the clear importance of service to Coachella Valley, and supporting the Blue Ribbon Commission and the opportunity for both states to invest in the corridor.

Commuter Rail

Commuter rail systems typically provide passenger service within a single region, and occasionally between regions. Service is more frequent during peak commuting periods. These commuter rail services are essential to supporting and connecting regional economies.

Commuter rail capital funding comes from federal, state, and local sources, while operating funding is the responsibility of local and regional entities. Exhibit 2.2 and Exhibit 2.3 map these commuter rail services. Appendix A discusses other transit services that connect to the commuter rail lines.

Commuter rail in California currently operates in five markets, as discussed in the following sections.

Caltrain

Caltrain offers service from San Francisco through the San Francisco Peninsula to San Jose and Gilroy. Ridership for FY 2016 was 19,233,427.^[95]

Route Description. Caltrain operates 7 days a week on 77 miles of track owned by the PCJPB—from San Francisco to Tamien in San Jose—and by the UPRR from Tamien to Gilroy. Caltrain serves 32 stations in 19 cities between the cities of San Francisco, San Jose, and Gilroy in the counties of San Francisco, San Mateo, and Santa Clara. The system has a mixture of local, limited, and express trains. It serves work centers in San Francisco, the Peninsula, and Silicon Valley, including developing residential areas in southern Santa Clara County. Caltrain operates 92 weekday trains between San Francisco and San Jose. Of the 92 trains, 22 are express Baby Bullet (limited-stop express) trains that have only four to six stops between San Francisco and San Jose.^[96] Weekdays, there is service at least every hour from 4 a.m. until midnight, with significantly higher frequencies during peak commute periods.

The system provides extensive weekend service, including 36 Saturday trains and 32 Sunday trains. The weekend service consists primarily of local trains operating between San Francisco and San Jose Diridon stations on 1-hour headways from 7 a.m. until 11 p.m. on Saturdays, and 8 a.m. to 10 p.m. on Sundays,^[97] supplemented by four Baby Bullet trains. On weekends, buses provide a connection between San Jose Diridon and Tamien stations between approximately 7:30 a.m. and 10:30 p.m.



95 Caltrain, Ridership, 2016, accessed 2016.

96 Caltrain, Weekend Timetable, 2016, accessed 2016.

97 Caltrain, Weekend Timetable, April 2016, accessed 2016.

The ridership increased by 9 percent between FY 2014 and FY 2015, and 3.7 percent between FY 2015 and FY 2016, with a total of 19.2 million total passengers for FY 2016. The frequency is dependent on time of day and location of stations, with the peak hours and busiest stations receiving the most frequent service. Caltrain owns and operates 118 passenger cars and 29 locomotives.^[98]

Travel Times. The current San Francisco to San Jose local trip time is 1 hour and 30 minutes. Caltrain also offers two express trains at various times during the daily schedule. The Limited Stop train has a travel time of approximately 1 hour and 15 minutes to 1 hour and 30 minutes from San Francisco to San Jose. The Baby Bullet train has a San Francisco to San Jose trip time of approximately 1 hour and 5 minutes.^[99]

Proposed Improvement Strategies. Focused improvements in the Caltrain corridor include the electrification program and installation of the PTC system. These improvements increase corridor frequency, efficiency, and safety.

Altamont Corridor Express

ACE offers service from Stockton to San Jose via Livermore and Fremont. ACE ridership was approximately 1.3 million in FY 2015-2016.^[100]

Route Description. ACE operates on weekdays on more than 85 miles of track owned by UPRR and PCJPB. ACE has just over 5,000 daily riders^[101] and serves a total of 10 stations (Stockton, Lathrop/Manteca, Tracy, Vasco Road, Livermore, Pleasanton, Fremont, Great America, Santa Clara, and San Jose). Free parking is available at all stations, except at the Santa Clara and San Jose stations, where there are daily fees of \$4 and \$3, respectively.

Travel Times. All westbound trips occur in the morning, with four total westbound trips departing Stockton between 4:20 a.m. and 7:05 a.m. All four eastbound trips occur in the evening, departing San Jose between 3:35 p.m. and 6:38 p.m. This schedule

serves commuters working in San Jose, but also those commuting from the Central Valley to the Tri-Valley, and to BART for other Bay Area destinations. The running time between Stockton and San Jose is approximately 2 hours and 12 minutes.^[102]

Proposed Improvement Strategies. ACE received TIRCP funding for platform lengthening, and has begun to expand capacity and access. This includes new locomotives capable of handling longer trains on the same schedule. Additionally, ACE was awarded \$400 million from SB 1 for additional *ACEforward* improvements.



Metrolink

Metrolink offers a large network of commuter rail services between Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura Counties. Metrolink served approximately 10.9 million passengers in FY 2015-2016.^[103]

Route Description. Metrolink currently operates 171 daily trains on weekdays, serving 60 stations on seven lines with more than 43,000 daily weekday passengers.^[104] The seven lines and their approximate running times are shown in **Table A.5** in Appendix A.

Most weekday trains operate during peak commuting hours before 8:30 a.m. and after 3:30 p.m. Metrolink also provides Saturday and Sunday service on the Antelope Valley, San Bernardino, Orange County, Inland Empire-Orange County, and 91/Perris Valley lines.

98 Caltrain, Commute Fleet, April 2016, accessed 2016.

99 Caltrain, Weekday Timetable, April 2016, accessed 2017.

100 American Public Transportation Association, *Transit Ridership Report: Fourth Quarter 2016*, March 2017, accessed 2016.

101 American Public Transportation Association, *Transit Ridership Report: Fourth Quarter 2016*, March 2017, accessed 2016.

102 ACE Rail Schedule, October 2016, accessed 2016.

103 American Public Transportation Association, *Transit Ridership Report: Fourth Quarter 2016*, March 2017, accessed 2016

104 *ibid*

Metrolink has a total of 534 route-miles in the regional system; of those, 146 are shared route miles, where Metrolink trains share the track with freight and other passenger trains.^[105] All Metrolink stations have ticket-vending machines. Stations on the Metrolink routes are owned by the cities or regional transportation agencies. More than 30,000 parking spaces are provided, the majority of which are free.

Travel Times. Current travel time from Los Angeles to San Bernardino is 1 hour and 43 minutes; from Los Angeles to Riverside is 1 hour and 28 minutes; and from Los Angeles to Perris is 2 hours and 13 minutes. All lines and their approximate running times are shown in **Table A.5** in Appendix A.

Proposed Improvement Strategies. Significant improvements are being realized through a majority replacement of the locomotive fleet with new Electro-Motive Diesel F-125 locomotives. Metrolink is also at the forefront of PTC completion, which will increase safety.



COASTER

COASTER commuter trains offer service along the San Diego County coastline, from Oceanside to San Diego, via Carlsbad, Encinitas, and Solana Beach. COASTER served 1,556,056 passengers in FY 2015-2016.^[106]

Route Description. The COASTER serves an average of 5,700 weekday passengers at eight stations between San Diego and Oceanside on 41 route-miles. It runs 126 trains per week, primarily concentrated during peak periods.^[107] Four round trips are operated on Saturdays, Sundays, and holidays. Additional service is provided in the spring and summer, and for special events such as home games at Petco Park for the San Diego Padres Major League Baseball franchise. All stations have free parking available, except downtown San Diego's Santa Fe Depot, where metered parking is available. Trains run between Oceanside and San Diego Santa Fe Depot from approximately 5:00 a.m. to 8:30 p.m.

Travel Times. Current travel time from Oceanside to San Diego is approximately 1 hour.

Proposed Improvement Strategies. Partner agencies are investing in corridor projects to expand single-track sections to double-track to improve service via increased frequency, speed, and reliability.



105 *ibid*

106 NCTD, Personal Communications, May 2017.

107 COASTER, *Fact Sheet*, 2016, accessed 2016.

Sonoma-Marin Area Rail Transit

SMART is a voter-approved commuter rail service that runs (in an initial segment) from Santa Rosa to San Rafael. Rail service on the initial segment commenced in August 2017.

Route Description. SMART's initial segment runs 43 miles from Sonoma County Airport in Santa Rosa, south to San Rafael Transit Center, with eight intermediate stops. Trains began commercial operations on August 25, 2017. The service will eventually serve 14 stations along 70 miles of rail, from Cloverdale to Larkspur Landing, where it will connect with commuter Golden Gate ferries to/from San Francisco; although the first phase in operation is from Santa Rosa Airport to San Rafael, a 43-mile section. The project aims to bring the publicly owned Northwestern Pacific Railroad alignment into passenger use to encourage modal shift and relieve traffic on Highway 101. Passenger service beyond the initial operating will be extended as funding becomes available.^[108]

Seven self-propelled DMU trainsets, each with two cars, operate along the initial segment. Trains run every 30 minutes in both directions during peak weekday hours, with one mid-day trip scheduled. SMART provides weekend service.

Travel Times. SMART launched passenger service in August 2017. The travel time from the northernmost station, Sonoma County Airport, to the southernmost station, San Rafael, is 1 hour and 7 minutes.

Proposed Improvement Strategies. The key improvements to this corridor include extensions to Cloverdale and Larkspur, adding service for additional markets and connections to the Bay Area.



108 Sonoma-Marin Area Rail Transit, Website, 2016, accessed 2016

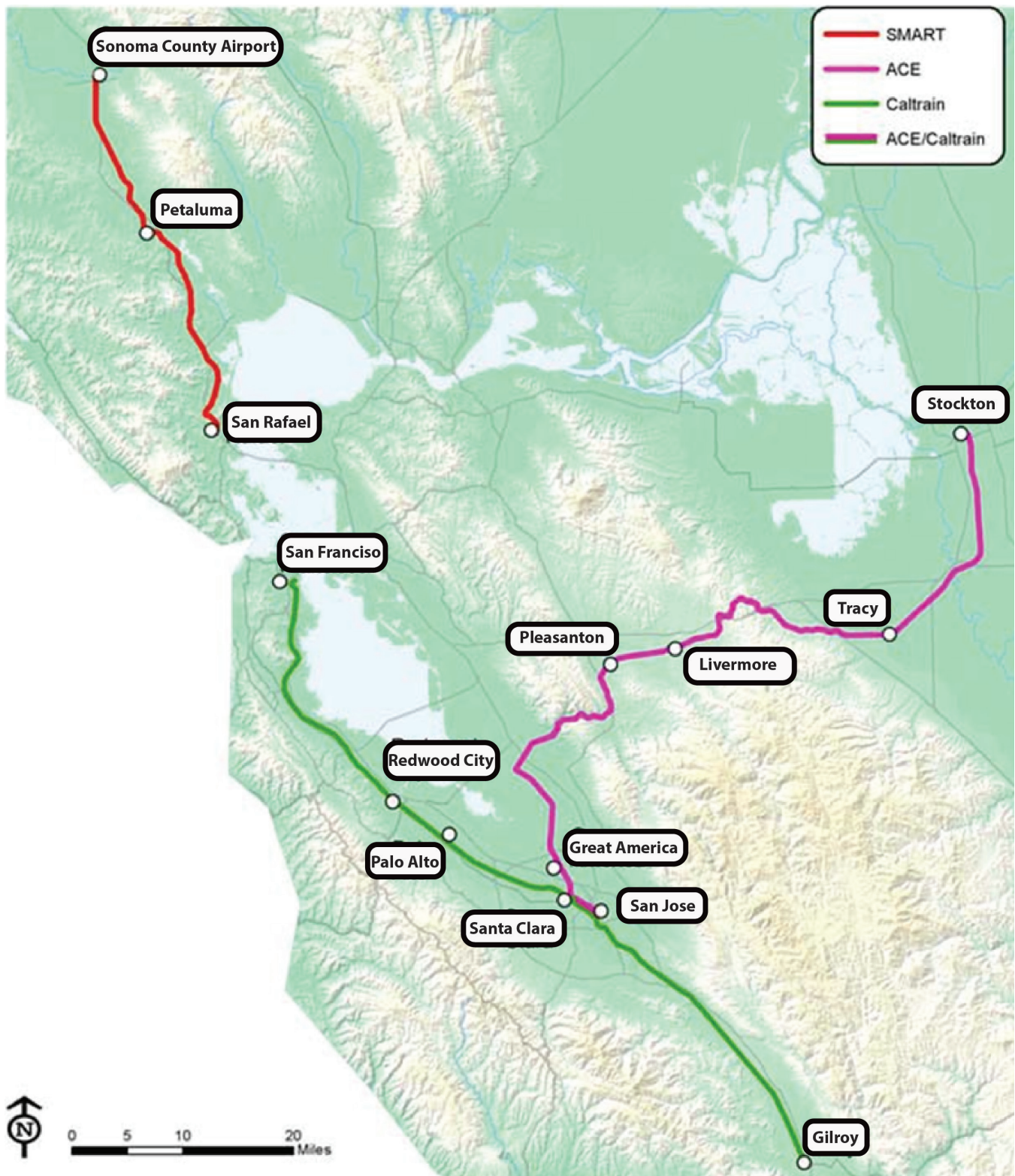


Exhibit 2.3: Existing Services as Part of the 2022 Vision (Northern California)

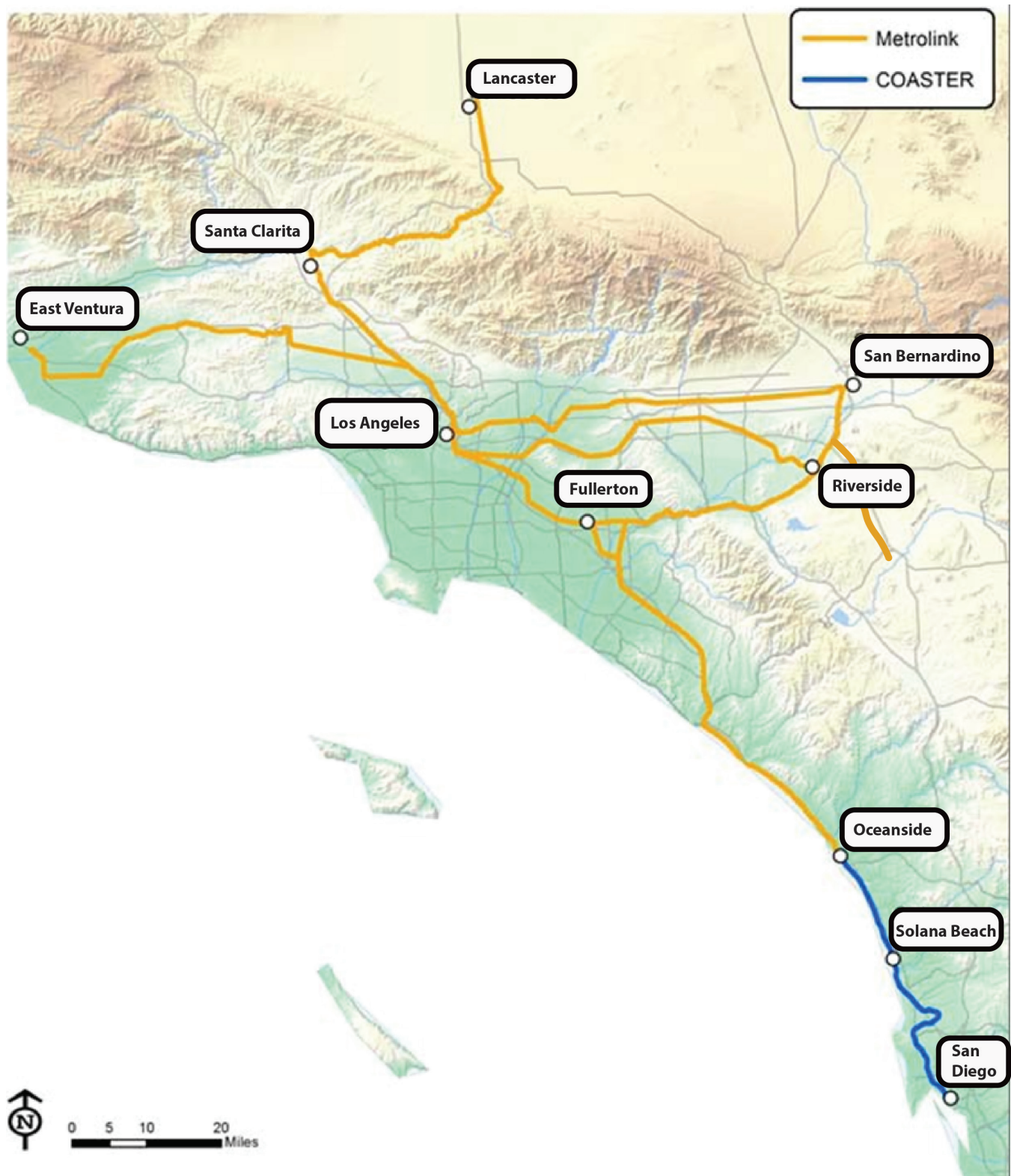


Exhibit 2.4: Existing Services as Part of the 2022 Vision (Southern California)

Commuter Rail: Service Providers

The five regional commuter systems serve the metropolitan areas of the San Francisco Bay Area, Los Angeles, and San Diego. Exhibits 2.2 and 2.3 provide maps of these services. These commuter rail services are overseen by various administrative structures, including JPAs and districts, composed of representatives from their rail service area. Appendix A, **Table A.6**, summarizes California's commuter rail services, routes, and administrators; and Table 2.3 provides ridership history for the services. Commuter rail services support multimodal transportation options, and their connections to longer-distance rail facilitate travel to statewide destinations.

All of the commuter rail operators contract with a private entity or entities, or Amtrak, to provide operations and equipment maintenance. Such an arrangement provides flexible opportunities to provide the best service to customers at the lowest cost, while minimizing risk.

Commuter rail services are currently provided by a variety of management structures, including JPAs and transit districts.

Peninsula Corridor Joint Powers Board (Caltrain)



The PCJPB owns and operates the Caltrain commuter rail service between San Francisco and Gilroy, which serves San Francisco, San Mateo, and

Santa Clara Counties. Passenger rail has been continuously operating for more than 150 years. PCJPB's Board of Directors includes nine members who represent San Francisco County (and City), San Mateo County, and Santa Clara County.^[109] Public involvement with the service began in 1980, when Caltrans contracted with the Southern Pacific Railroad to fund operations. In 1987, the PCJPB was formed to manage the line. The PCJPB bought the railroad right-of-way in 1991, and subsequently extended service to Gilroy. Service is provided by a private operator under contract to the PCJPB.

Southern California Regional Rail Authority (Metrolink)



METROLINK®

SCRRA operates and governs Metrolink. SCRRA's eleven-member Board of Directors represents five county agencies (LA Metro, OCTA, RCTC, San Bernardino County Transportation Authority, and Ventura County Transportation Commission).^[110] Metrolink serves six counties, and currently operates a network of more than 500 route-miles. A substantial portion of the service is operated on publicly owned lines, but services are also provided on lines owned and operated by BNSF and UPRR.

San Joaquin Regional Rail Commission



SJRRC owns, operates, and makes policy for ACE. The San Joaquin Council of Governments appoints the Board of Directors, which governs SJRRC. Board selections are made based on nominations by local governments.^[111] UPRR is the primary track owner, and PCJPB owns the track between Santa Clara and San Jose.

North County Transit District (COASTER)



NCTD operates the COASTER along with the BREEZE bus service and SPRINTER light-rail service. The NCTD Board of Directors includes members from incorporated cities in its jurisdiction, along with the Fifth District County Supervisor, who represents unincorporated areas of the jurisdictions and the cities of Carlsbad, Oceanside, Vista, and San Marcos.^[112] NCTD is the primary track owner, and the SDMTS is a track owner in San Diego.

109 Caltrain, Board of Directors, 2017, accessed 2017.

110 Metrolink, About Metrolink, 2017, accessed 2017.

111 ACE, Board of Directors, 2017, accessed 2017.

112 NCTD, Board of Directors, 2017, accessed 2017.

Sonoma-Marín Area Rail Transit District



The SMART District currently oversees the development, planning, and operation of the SMART rail service. SMART's twelve-member Board is composed of two county supervisors from both Marin County and Sonoma County, three City Council members from each county, and two Golden Gate Bridge District members.^[113]

Overall, commuter rail ridership has continued to grow over the past decade. Table 2.3 shows that annual ridership for the state's four commuter rail operators increased by more than 11 million trips since 2005. FY 2015 ridership was 33.3 million across the four lines. Caltrain ridership grew the fastest. With an express service (i.e., the Baby Bullet) and a resurgent job market, it nearly doubled ridership from 2005 to 2015.

Table 2.3: Historical Annual Ridership Information for California's Commuter Rail Operators

State Fiscal Year	ACE ^a	Caltrain ^b	COASTER ^c	Metrolink ^d	Total Commuter Rail Ridership
2005	941,693	9,454,467	1,432,468	9,946,566	21,775,194
2006	708,274	10,148,616	1,554,450	10,584,078	22,995,418
2007	805,257	10,980,802	1,560,729	11,026,264	24,373,052
2008	797,253	11,961,717	1,686,015	12,013,206	26,458,191
2009	683,190	12,691,717	1,501,619	12,332,037	27,208,563
2010	676,958	11,967,716	1,271,620	11,325,800	25,242,094
2011	838,750	12,673,420	1,390,142	11,142,645	26,044,957
2012	786,947	14,134,117	1,624,211	11,977,540	28,522,815
2013	940,774	15,595,559	1,629,196	12,112,826	30,278,355
2014	1,713,664	17,029,447	1,673,816	11,769,645	32,186,572
2015	1,244,309	18,567,173	1,641,525	11,826,382	33,279,389
2016	1,295,500	19,233,427	1,556,056	10,903,000	32,987,983

Note: Map excludes SMART, whose revenue operations will begin in 2017.

^a Ridership data for 2004 to 2008: California State Controller's Office, Transit Operators and Non-Transit Claimants Annual Report. Other years: State Controller's Office, Open Data website, 2016. Accessed 2016.

^b Caltrain, Personal Communications (2016).

^c NCTD, Personal Communications (2016).

^d Metrolink, Monthly Line Ridership Reports. Accessed 2016.

113 SMART, Who We Are, 2017, accessed 2017.

Urban Rail Systems

Urban rail systems provide passenger service within a metropolitan area. Urban rail service exists in a number of different forms for varying purposes, and includes high-capacity, high-speed heavy-rail transit service (i.e., subways and elevated trains); lower-speed, lower-capacity streetcars and cable cars offering localized service (and often sharing roadways with motor vehicles); and light-rail systems, which offer capacities and speeds between those of heavy rail and streetcar systems. There are seven different agencies:

- Bay Area Rapid Transit (BART),
- Los Angeles County Metropolitan Transportation Authority (Metro)
- Sacramento Regional Transit (RT)
- San Francisco Municipal Transportation Agency (SFMTA)
- Santa Clara Valley Transportation Authority (SCVTA)
- North County Transit District (NCTD)
- San Diego Metropolitan Transit System (SDMTS)

These agencies offer nine urban rail transit systems, including two heavy-rail transit systems, five light-rail transit systems, and one cable car system. Table 2.4 details urban rail services by operator. Connections to commuter and intercity rail systems provide convenient access for passengers traveling long distances with rail.



Table 2.4: Existing Urban Rail Systems in California^[114]

Type	Operator	Service Name	Service Area
Heavy-Rail Transit	BART	BART Green Line	Warm Springs/South Fremont (Berryessa) ^a – Oakland – San Francisco – Daly City
		Orange Line	Richmond – Oakland – Warm Springs/South Fremont (Berryessa)
		Red Line	Richmond – San Francisco – Daly City – Millbrae
		Blue Line	Dublin/Pleasanton – Oakland – San Francisco – Daly City
		Yellow Line	Pittsburg/Bay Point – San Francisco – San Francisco Airport – Millbrae
	LA Metro	Metro Rail: Red Line	Los Angeles – Hollywood – North Hollywood
		Purple Line	Los Angeles – Westlake – Wilshire/Western

^a Berryessa BART will be operational in 2018.

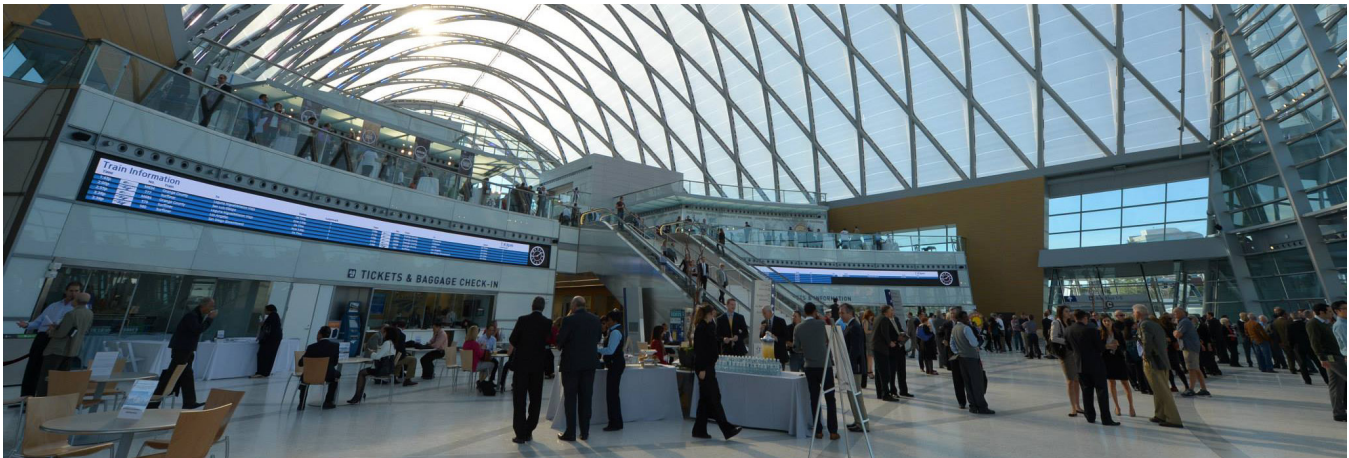


114 Sources: BART, LA Metro, RT, SFMTA, SCVTA, and SDMTS, 2016.

Table 2.4: Existing Urban Rail Systems in California (continued)

Type	Operator	Service Name	Service Area
Light-Rail Transit	RT	RT Light Rail: Gold Line	Downtown – Sunrise – Folsom
		Blue Line	Watt/I-80 – Downtown – Consumnes River College
		Green Line	Downtown Sacramento – Richards Boulevard.
	SFMTA	<i>San Francisco Municipal Railway (Muni):</i> F – Market-Wharves (Streetcar Line)	Fisherman's Wharf – Castro
		J – Church	Ferry Building – Noe Valley – Balboa Park
		K – Ingleside	Ferry Building – Ingleside District – Balboa Park
		L – Taraval	Ferry Building – San Francisco Zoo
		M – Oceanview	Ferry Building – Oceanview District – Balboa Park
		N – Judah	Caltrain Station – Ocean Beach
		T – Third Street	Castro Station – Bayshore
	SCVTA	<i>SCVTA Light Rail:</i> 900: Almaden to Ohlone/Chynoweth	Almaden – Ohlone/Chynoweth
		901: Santa Teresa to Alum Rock	Santa Teresa – Ohlone/Chynoweth – San Jose – Tasman – Alum Rock
		902: Mountain View to Winchester	Mountain View – Tasman – San Jose – Winchester
	LA Metro	<i>Metro Rail:</i> Blue Line	Los Angeles – Compton – Long Beach
		Gold Line	East Los Angeles – LAUS – Pasadena – Azusa
		Green Line	Redondo Beach – Aviation/Los Angeles International Airport (LAX) – Lynwood-Norwalk
		Expo Line	Los Angeles – Crenshaw – Culver City – Santa Monica
	NCTD	SPRINTER	Oceanside – Vista – San Marcos – Escondido
	SDMTS	<i>San Diego Trolley:</i> Blue Line	San Diego – San Ysidro
		Orange Line	San Diego – El Cajon
		Green Line	San Diego – Qualcomm – San Diego State University – Santee
Cable Car	SFMTA	<i>Muni Cable Car:</i> California Street	Embarcadero Station – California Street – Van Ness
		Powell-Mason/Hyde	Powell Street – Mason Street – Taylor/Bay Street, Powell Street – Hyde Street – Victorian Park





Excursion Passenger Rail Services

Excursion railroads typically serve recreational trips and provide an alternative to automobile travel for tourists visiting scenic destinations throughout the state. They also provide an educational function, helping visitors understand what rail travel was like in previous generations. Often, visitors ride in historic railroad passenger cars pulled by diesel locomotives—and in some cases, by steam locomotives. Many excursion railroads operate in California, including the Sierra Railroad; the Fillmore and Western Railway; the Santa Cruz & Monterey Bay Railway; the Santa Cruz, Big Trees, & Pacific Railway; the Sacramento Southern Railroad; and the Napa Valley Wine Train. These railroads are sometimes referred to as heritage railroads. In addition, regular

seasonal charter trains operate to serve markets such as the Reno and Lake Tahoe area, often using a combination of Amtrak and private rail equipment.

Passenger Intermodal Facilities

Many passenger intermodal facilities throughout California facilitate transfers between intercity rail, commuter rail, and bus/rail transit. Most Amtrak stations in California offer transit connections, while several key intermodal hubs offer transfers to other travel modes. Table 2.5 details key passenger intermodal facilities and their location, and available connections to Amtrak other travel modes.

California's rail system also facilitates connections to state airports. Appendix A, Table A.6, indicates rail corridors serving California's major commercial airports.



The Napa Valley Wine Train serves recreational trips in the Napa Valley wine country

Source: <https://commons.wikimedia.org/>

Table 2.5: Key Passenger Rail Intermodal Facilities¹¹⁵

Facility Name	Location	Connecting Amtrak Services	Connecting Commuter Rail/Transit Services	Other Connections
Anaheim – Anaheim Regional Transportation Intermodal Center Station	Anaheim	<i>Pacific Surfliner</i>	Metrolink, OCTA buses	Anaheim Resort Transit to Disneyland
Bob Hope Airport Regional Intermodal Transportation Center	Burbank	<i>Pacific Surfliner</i> , Amtrak Thruway bus	Metrolink, LA Metro buses, Burbank Bus shuttle connection to LA Metro Red/Orange Line	Bob Hope Airport
Emeryville Amtrak	Emeryville	<i>Capitol Corridor</i> , <i>Coast Starlight</i> , <i>San Joaquins</i> , <i>California Zephyr</i> , Amtrak Thruway bus	Alameda-Contra Costa Transit District (AC Transit) buses, Emery-Go-Round	San Francisco
LAUS	Los Angeles	<i>Pacific Surfliner</i> , <i>Southwest Chief</i> , <i>Sunset Limited</i> , Amtrak Thruway bus	Los Angeles Department of Transportation (LADOT) Downtown Area Short Hop (DASH); LA Metro buses and Gold, Red, and Purple Line rail; Metrolink; municipal buses	LAX (via FlyAway shuttle)
Millbrae Intermodal Terminal	Millbrae	N/A	BART, Burlingame Trolley, Caltrain, San Mateo County District (SamTrans) buses	San Francisco International Airport (via BART)
Oakland Coliseum	Oakland	<i>Capitol Corridor</i>	BART, AC Transit buses	Oakland Airport shuttle
Oceanside Transportation Center	Oceanside	<i>Pacific Surfliner</i> , <i>Coast Starlight</i> , Amtrak Thruway bus	COASTER, Metrolink, NCTD buses, Riverside Transit, SPRINTER	BREEZE Buses
Old Town San Diego	San Diego	<i>Pacific Surfliner</i>	COASTER, SDMTS Trolley and buses	
Richmond Amtrak/BART Station	Richmond	<i>Capitol Corridor</i> , <i>San Joaquins</i>	BART, AC Transit buses	N/A
Sacramento Valley Station	Sacramento	<i>Capitol Corridor</i> , <i>Coast Starlight</i> , <i>San Joaquins</i> , <i>California Zephyr</i> , Amtrak Thruway bus	RT light rail and buses, Roseville Transit Kings' game day service	N/A
Santa Clara Station	Santa Clara	<i>Capitol Corridor</i> , Amtrak Thruway bus	ACE, Caltrain, SCVTA light rail and buses	SJC Airport (via SCVTA)
Santa Fe Depot	San Diego	<i>Pacific Surfliner</i> , Amtrak Thruway bus	SDMTS trolley/light rail and buses	San Diego Airport (via SDMTS)
San Jose Diridon Station	San Jose	<i>Capitol Corridor</i> , <i>Coast Starlight</i> , Amtrak Thruway bus	ACE, Caltrain, Santa Cruz METRO and Monterey-Salinas Transit buses, SCVTA light rail and buses	N/A
Stockton ACE	Stockton	<i>San Joaquins</i> , Amtrak Thruway Bus	ACE, San Joaquin Regional Transit District buses	N/A
San Ysidro	San Diego	N/A	SDMTS trolley/light rail and buses	Tijuana Airport, United States-Mexico border connection

115 Source: Cambridge Systematics, Inc., 2016.

2.1.2 Existing State-Supported Intercity Rail Performance

This section presents performance information for the three State-supported intercity passenger rail routes. Appendix A provides more detailed passenger rail system performance data.

Service Performance of State-Supported Routes

Table 2.6 presents historic intercity passenger rail ridership and service levels on State-supported routes. *Pacific Surfliner* ridership increased by 10 percent from FFY 2006-2016, to more than 2.9 million. *San Joaquins* ridership increased 40 percent over the same period, with a ridership of 1.1 million in FFY 2016. Capitol Corridor ridership increased 23 percent, with a ridership of more than 1.5 million in FFY 2016.¹¹⁶ During the recession, ridership for the commuter-heavy *Pacific Surfliner* and *Capitol Corridor* dipped more than ridership for the *San Joaquins*.

Ridership across the three routes increased 19 percent between FFY 2006 and FFY 2016, and was more than 5.5 million in FFY 2016. The largest single-year ridership decrease occurred in FFY 2009 (8 percent), and the largest single-year increase occurred in FFY 2008 (12 percent).

Table 2.6 also presents passenger mile and OTP. A passenger mile is equivalent to 1 mile traveled by one passenger. OTP is the percentage of instances in which a train arrives on time at a station, where on time is defined as a deviation from schedule of 15 minutes or less. “Frequency” refers to the number of round trips per day.

Table 2.7 displays the financial and operational performance of the State-supported routes. Both revenues and expenses grew substantially over the period from FFY 2006 to FFY 2016. However, expenses grew at a slower rate, resulting in an increasing farebox ratio (the total fare revenue divided by total operating expenses, a metric that shows the fraction of operating expenses that are

met by passenger fares). Across the three lines, revenues increased by 100 percent over the period, to approximately \$150.3 million in FFY 2016; and expenses increased by 50 percent, to approximately \$236 million. In FFY 2014, under the requirements of Section 209 of PRIIA, the State assumed responsibility for 100 percent of the operating costs on the *Pacific Surfliner*; therefore, both revenues and expenses increased significantly, beginning in that year. Farebox ratios during the last 10 years grew from 56.4 percent to 78.8 percent for *Pacific Surfliner*, 46 percent to 49.6 percent for *San Joaquin*, and 38.6 percent to 56.3 percent for *Capitol Corridor*.



¹¹⁶ Amtrak began adjusting Capitol Corridor ridership numbers in FY 2014 onwards to account for actual ticket scans. Previous estimations made usage assumptions about multi-ride tickets, and these estimates were inflated. The current method results in reported ridership being 15 to 20 percent lower than prior years. CCJPA, Capitol Corridor Intercity Passenger Rail Service Business Plan Update FY 2016-17 – FY 2017-2018 Final Draft, February 2016, accessed 2017.

Table 2.6: State-Supported Routes – Ridership and Service Levels⁽¹¹⁷⁾

	Actual											
	FFY 05	FFY 06	FFY 07	FFY 08	FFY 09	FFY 10	FFY 11	FFY 12	FFY 13	FFY 14	FFY 15	FFY 16
Pacific Surfliner Route												
Annual Ridership (thousands) ^a	2,520	2,658	2,707	2,899	2,593	2,614	2,787	2,640	2,706	2,681	2,827	2,924
Annual Passenger Miles (thousands)	201,915	218,372	222,446	240,761	213,656	215,640	230,759	223,501	232,276	205,497	241,451	251,650
OTP	72.90%	76.10%	74.80%	76.1%	83.1%	76.3%	77.5%	75.5%	84.8%	77.0%	77.9%	78.1%
Frequency (Round Trips) ^b												
San Diego – Los Angeles ^c	11	11	11	11	11	11	11	11	11	11	11	11
Los Angeles – Goleta	5	5	5	5	5	5	5	5	5	5	5	5
Goleta – San Luis Obispo	2	2	2	2	2	2	2	2	2	2	2	2
San Joaquins Route												
Annual Ridership (thousands)	756	800	805	950	929	978	1,067	1,145	1,220	1,188	1,177	1,122
Annual Passenger Miles (thousands)	115,621	120,615	120,914	139,005	133,712	139,405	156,428	166,337	170,076	165,538	164,250	155,936
OTP	63.50%	62.60%	67.90%	82.6%	89.6%	90.7%	89.5%	88.1%	77.7%	75.4%	73.4%	83.2%
Frequency (Round Trips)												
Oakland – Bakersfield ^f	4	4	4	4	4	4	4	4	4	4	4	5
Sacramento – Bakersfield	2	2	2	2	2	2	2	2	2	2	2	2
Capitol Corridor Route												
Annual Ridership (thousands) ^d	1,260	1,274	1,450	1,694	1,600	1,581	1,709	1,746	1,701	1,419	1,475	1,561
Annual Passenger Miles (thousands)	85,906	86,519	96,343	109,882	102,283	101,251	109,074	111,191	112,158	96,161	98,943	104,135
OTP	84.70%	72.70%	74.60%	86.0%	92.3%	93.1%	94.9%	93.9%	95.0%	95.3%	93.0%	94.1%
Frequency (Round Trips)												
San Jose – Oakland	4	7	7	7	7	7	7	7	7	7	7	7
Oakland – Sacramento ^d	12	16	16	16	16	16	16	15	15	15	15	15
Sacramento – Auburn	1	1	1	1	1	1	1	1	1	1	1	1
State-Supported Route Summary												
Annual Ridership (thousands)	4,537	4,731	4,962	5,542	5,122	5,172	5,563	5,531	5,627	5,288	5,479	5,607
Annual Passenger Miles (thousands)	403,442	425,506	439,704	489,648	449,651	456,296	496,260	501,029	514,510	467,196	504,644	511,721

a Total ridership, including State and Amtrak shares.

b Service frequencies shown are for weekday service.

c One additional weekend round trip. Approximately 12 weekend round trips.

d See earlier footnote about Capitol Corridor ridership reporting methodology changing in FY 2014 to reflect actual ticket scans. Change resulted in 15-20% lower reported ridership.

e End point OTP.

f Starting in June 2016, the *San Joaquins* began offering 5 Oakland-Bakersfield round trips per day.

117 Sources: Caltrans rail operational database.

Table 2.7: State-Supported Routes – Financial Operational Performance ^[118]

	Actual											
	FFY 05	FFY 06	FFY 07	FFY 08	FFY 09	FFY 10	FFY 11	FFY 12	FFY 13	FFY 14	FFY 15	FFY 16
Revenue (Million Dollars)												
Pacific Surfliner (State Portion)	\$28.10	\$32.60	\$35.50	\$38.30	\$34.90	\$35.80	\$40.30	\$43.09	\$46.38	\$70.40	\$75.80	\$79.47
San Joaquins	\$23.30	\$26.50	\$26.40	\$31.30	\$29.60	\$33.20	\$37.80	\$41.09	\$41.83	\$41.22	\$40.46	\$38.67
Capitol Corridor	\$15.20	\$16.00	\$19.30	\$23.80	\$23.50	\$24.20	\$27.10	\$29.49	\$29.19	\$29.23	\$30.09	\$32.19
Total Revenue	\$66.60	\$75.10	\$81.20	\$93.3	\$88.00	\$93.20	\$105.30	\$113.67	\$117.40	\$140.85	\$146.35	\$150.33
Expenses (Million Dollars)												
Pacific Surfliner (State Portion)	\$49.20	\$57.80	\$56.90	\$63.00	\$61.60	\$67.00	\$69.80	\$72.88	\$73.76	\$102.73	\$110.00	\$100.90
San Joaquins	\$50.80	\$58.20	\$60.60	\$68.30	\$65.10	\$67.80	\$69.80	\$73.09	\$73.26	\$81.86	\$80.02	\$78.04
Capitol Corridor	\$39.30	\$41.50	\$46.00	\$53.30	\$51.00	\$53.90	\$57.90	\$59.41	\$58.64	\$57.71	\$58.06	\$57.14
Total Expenses	\$139.30	\$157.50	\$163.50	\$184.7	\$177.7	\$188.7	\$197.5	\$205.38	\$205.66	\$242.30	\$248.08	\$236.08
Farebox Ratio												
Pacific Surfliner	57.10%	56.40%	62.40%	60.8%	56.6%	53.5%	57.7%	59.1%	62.9%	68.5%	68.9%	78.8%
San Joaquins	44.50%	46.00%	45.50%	45.8%	45.5%	48.9%	54.2%	56.2%	57.1%	50.4%	50.6%	49.6%
Capitol Corridor	36.60%	38.60%	41.90%	44.6%	46.1%	44.9%	46.9%	49.6%	49.8%	50.6%	51.8%	56.3%
State Costs (Million Dollars)												
Existing Routes												
Pacific Surfliner	\$21.20	\$25.20	\$21.40	\$24.7	\$26.8	\$31.2	\$29.6	\$29.7	\$27.4	\$32.3	\$34.2	\$32.55
San Joaquins	\$27.40	\$31.70	\$34.20	\$37.1	\$35.5	\$33.6	\$32.0	\$32	\$31.4	\$40.6	\$40.1	\$43.44
Capitol Corridor	\$24.10	\$25.50	\$26.70	\$29.6	\$27.5	\$29.7	\$30.2	\$29.9	\$29.5	\$28.5	\$27.96	\$33.01
Subtotal	\$72.70	\$82.40	\$82.30	\$91.3	\$89.7	\$94.5	\$91.7	\$91.6	\$88.3	\$101.4	\$102.26	\$109.00
Equipment Heavy Overhaul	\$13.50	\$13.80	\$14.00	\$13.8	\$13.2	\$12.7	\$16.1	\$2.6	\$4.2	\$1.6	\$1.7	\$0
Total	\$86.20	\$96.20	\$96.30	\$105.1	\$102.9	\$107.2	\$107.8	\$94.2	\$92.5	\$103	\$103.96	\$109.00

118 Source: Caltrans rail operational database.

2.1.3 California's Freight Railroad System

California's freight railroad system links industries and consumers throughout the state with North American and overseas markets. The 5,295-mile freight rail system is central to the handling of the state's international trade, and plays a central role in maintaining the competitiveness of some of its principal freight-oriented industries. In 2013, the base year for the Rail Plan, California's rail network handled 159.6 million tons of commodities, of which 60.9 million tons originated, and 103.7 million tons terminated, in California.^[119] According to the Association of American Railroads (AAR), California ranked eighth among states in terms of rail tons originated in 2012.^[120]

Railroads are commonly characterized in the context of revenues, with Class I being the largest, and Class III being the smallest. BNSF and UPRR, two Class I railroads, each with annual revenues of more than \$475 million (2013), provide service throughout the state. Class II carriers have revenues between \$38.05 million and \$475.75 million (2013); there are no Class II railroads in California. Finally, with revenues of less than \$38.05 million (2013), Class III carriers, commonly referred to as "short lines," provide service to various communities across the state. In 2016, a total of 27 short lines, including seven terminal and switching railroads, operated in the state. All freight railroads serving the state, along with their parent company (if they have one) and route mileage operated (miles owned plus trackage rights), are listed in Table 2.8.

California's Class I and publicly owned rail network is displayed in Exhibit 2.4, and short lines operating in the state are shown in Exhibit 2.5. The vast majority of the route-miles in this network (3,871 miles) is owned by the two Class I railroads, BNSF and UPRR, followed by short lines (1,296 route-miles). Public ownership accounts for almost 700 miles, most of which are concentrated around the state's major metropolitan areas in Southern California and the Bay Area. Because the publicly owned lines are Class I spin-offs of the former Atchison Topeka and Santa Fe Railway and the former Southern Pacific Railroad, successors BNSF and UPRR continue to hold trackage rights over most of the existing mileage. In some instances, these rights have been ceded or transferred to short-line operators.

Union Pacific Railroad

UPRR operates 32,000 route-miles of track across 23 states, and is California's largest railroad in terms of volume, employees, and mileage. In 2015, with a workforce of about 5,000 employees, UPRR's California operations handled more than 3 million carloads on a network of almost 3,300 miles.^[121]



119 AAR, AAR Fact Sheet, California (2013).

120 AAR, AAR State Rankings 2012.

121 UPRR, California Fact Sheets, 2015; 10-K Filings (2011).

Table 2.8: California's Freight Railroads^[122]

Name	Standard Carrier Alpha Code	Parent Company	Total Miles Operated ^b
BNSF Railway	BNSF	Berkshire Hathaway	2,114
UPRR	UPRR	Independent	3,292
Class III Railroads (Short Lines)			
– Local Railroads			
Arizona & California Railroad Company	ARZC	Genesee & Wyoming Inc.	190 (84 in CA)
California Northern Railroad	CFNR	Genesee & Wyoming Inc.	210
Central Oregon & Pacific Railroad	CORP	Genesee & Wyoming Inc.	305 (56 in CA)
Fillmore and Western ^a	FWRV	Independent	28
Lake County Railway	LCR/LCY	Frontier Rail	54
Napa Valley Wine Train ^a	NVRR	Independent	18
Northwestern Pacific Co.	NWP	Independent	63
Pacific Sun Railroad, LLC	PSRR	Watco	62
Sacramento Southern Railroad	SSR	State of California	3
Sacramento Valley Railroad	SAV	Patriot Rail	7
San Diego & Imperial Valley Railroad	SDIY	Genesee & Wyoming Inc.	1
San Joaquin Valley Railroad Company	SJVR	Genesee & Wyoming Inc.	297
San Francisco Bay Railroad	SFBR	Independent	7
Santa Cruz, Big Trees & Pacific Railway	SCBG	Roaring Camp, Inc.	9
Santa Cruz and Monterey Bay Railway Company	SCMB	Iowa Pacific Holdings	31
Santa Maria Valley Railroad	SMVRR	Independent	14
Sierra Northern Railway	SERA	Independent	68
Stockton Terminal and Eastern Railroad	STE	OmniTrax	25
Trona Railway Company	TRC	Searles Valley Minerals/Nirma	31
Ventura County Railroad Company	VCRR	Genesee & Wyoming Inc.	9
West Isle Line, Inc.	WFS	Western Farm Service	5
– Switching and Terminal Railroads			
Central California Traction	CCT	BNSF/UPRR	96
Los Angeles Junction Railway Company	LAJ	BNSF	64
Modesto & Empire Traction Company	MET	Independent	49
Oakland Terminal Railway	OTR	BNSF/UPRR	10
Pacific Harbor Line, Inc.	PHL	Anacostia & Pacific	59
Quincy Railroad	QRR	Independent	3
Richmond Pacific Railroad Corporation	RPRC	Independent	6

^a Primarily passenger operator, but does handle some freight.

^b Includes trackage rights.

Note: The table does not include freight railroads that operate solely for the purpose of its owner. These include CEMEX's South Western Portland Cement Railroad, U.S. Gypsum's operation near Plaster City, and several railroads operating on military facilities.

122 Sources: American Short Line and Regional Railroad Association, AAR, carrier Interviews 2016.



Exhibit 2.5: Class I and Public Agency Owned Rail System



Exhibit 2.6: Short Line and Switching and Terminal Freight Railroads ^[123]

Note: Exhibit shows short lines mentioned in Table 2.8.

¹²³ Rail lines with less than 10 miles of track are not shown on the map.

Today, UPRR operates an expansive rail line network that serves California's diverse regions, including the agriculturally rich San Joaquin Valley, the Port of Oakland, the San Francisco Bay Area, and the Los Angeles metropolitan area. For its carload services, UPRR operates two system classification yards at West Colton in southern California and Roseville in northern California; and three regional yards in Lathrop (San Joaquin County), Commerce (Los Angeles County), and Yermo (San Bernardino County). Intermodal services are available at six dedicated terminals, in Oakland, Stockton, and the Los Angeles and Long Beach region. UPRR also has shared use of the on-dock rail terminals at POLA and POLB, which are discussed in more detail in Section 2.1.5. In California, UPRR holds trackage rights over BNSF in various locations, most notably between San Bernardino and Yermo over Cajon Pass.

BNSF Railway Company



BNSF is North America's largest intermodal carrier, handling more than 4.9 million trailers and containers in 2015 in the United States, compared to UPRR's 3.9 million.^{[124][125]} BNSF operates more than 32,000 route-miles of track throughout the United States across 28 states. In addition to its own routes, BNSF holds trackage rights over the UPRR between Salt Lake City and the San Francisco Bay Area, Tehachapi Pass between Bakersfield and Mojave, and in the Central Valley.

BNSF operates more than 2,114 route-miles in California, with a workforce of almost 3,500 employees. These operations occur on 1,149 miles owned by BNSF and 965 miles of line on which BNSF holds trackage rights. BNSF moves about 3.9 million carloads per year in California.^[126] Major BNSF freight hubs include the major system yard at Barstow, five dedicated intermodal terminals, and shared on-dock rail facilities at POLA and POLB. There are a total of 11 carload yards located in the cities of Bakersfield, Barstow, Commerce, Needles, Riverbank, San

Bernardino, San Diego, Stockton, and Wilmington. The five intermodal facilities are in Fresno, Richmond, San Bernardino, Stockton, and Los Angeles.^[127]

California serves as the western anchor of BNSF's Transcontinental Corridor route, which links Southern and Northern California with Chicago. On this corridor, consumer products—including everything from food and automobile products to agricultural and industrial products—represent the majority of BNSF's transported commodities.^[128]

Class III Short Lines (Local, Terminal, and Switching Railroads)

California's 20 local railroads and seven switching and terminal railroads are a diverse group, varying widely in terms of mileage, ownership, traffic volumes, and markets served. Although some, such as the Santa Maria Valley Railroad, the Trona Railway, and the Modesto & Empire Traction Company, have been longstanding fixtures in California's rail map, many more came into existence during the industry restructuring of the 1980s and 1990s, when the Class I railroads streamlined their networks by selling off or abandoning light-density lines. Since then, the short-line sector has consolidated, with the majority of carriers coming under the control of a handful of holding companies. In California, as in the rest of the United States, the largest short-line operator is Genesee & Wyoming, operating six of the 20 short lines; and 657 miles, or 51 percent of the total short-line mileage. Other holding companies, such as Watco, Omnitrax, and Patriot Rail, are also present in California, with each operating only one railroad. Also, BNSF and UPRR continue to own three switching railroads (two of them jointly).

With the exception of Pacific Harbor Line, which handles container traffic at the San Pedro Bay ports, the State's short lines focus on carload traffic. By providing "last mile" service to many smaller shippers in the state's rural communities, they ensure continued access to rail service and facilitate economic development. Tourist passenger service is also part of the business mix for several short lines; for a few, such as the Napa Valley Railroad and the Fillmore and Western, it is their primary business.

124 UPRR, Union Pacific Railroad: Weekly Carloads and Intermodal Traffic Report, Week 52 (Week of December 27, 2015 through January 2, 2016; Week of December 28, 2014 through January 3, 2015).

125 BNSF Railway, BNSF Railway: Weekly Intermodal and Carload Units Report Week 52 (Week ending January 2, 2016; Week ending January 3, 2015).

126 BNSF, California 2015 Fact Sheet (2015).

127 *ibid*

128 BNSF, State Fact Sheet for the State of California (2010).

Short Line Trends

The vast majority (89 percent) of rail traffic tonnage in California is handled entirely by the Class I railroads. In part, the high volume of intermodal freight drives the high Class I share, traffic that short lines commonly do not handle. The situation is different for carload traffic, where almost one in five (19 percent) originated carloads begin their trip on a short line. Eight percent of carloads end their trip on a California short line. For the more rural regions of the state, short lines take on even greater importance as a means to accessing rail service. As shown in Table 2.9, upwards of 41 percent of all carload traffic originating in the Central Valley is on short lines. In Northern California, more than one out of four carloads begin or end their trip on a short line.

Short lines are responsible for transporting most of the alcoholic beverages (93 percent) and fuel oils (78 percent) originating in California. They are also responsible for transporting more than half of the transportation equipment (52 percent), and almost a third of fertilizers (28 percent) terminating in California.

Because carload traffic is projected to increase by more than 50 percent between 2013 and 2040, (Table 2.9) short lines will need to grow to handle the increasing carload traffic.

Short Line Performance

It is apparent that some short lines operating in California are not meeting critical volume thresholds, and services and investment in track and equipment are declining. Concurrently, short line railroads are facing pressure for investment to remain competitive with the Class I railroads, as well as other modes of freight transportation. Remaining competitive includes short lines being able to accommodate heavier-weight railcars (i.e., loaded car weights of 286,000 pounds, or “286K”), and providing competitive pricing and service offerings in conjunction with their Class I connections. Although the Class I rail network is generally in excellent physical condition, short lines tend to have less well-maintained track and other infrastructure elements. Although most of California’s short lines can handle 286K railcars, light track and outdated bridges on a number of routes greatly impede efficiency and produce risks.

Many of the short lines contacted during the development of the Rail Plan expressed concerns regarding new environmental, safety, and insurance-related regulations (including the recently imposed hazmat fees, and two-person crew requirements) that they are required to follow. Although the desired intent behind these requirements is positive, many of the short lines are cash-strapped and find the additional costs imposed by these regulations difficult to bear.

Table 2.9: Short Line Carload Service Traffic Originating (left) and Terminating (right) in California^[129]

California Regions	Originating		Terminating	
	Short Line Traffic % (units)	Short Line Traffic % (tons)	Short Line Traffic % (units)	Short Line Traffic % (tons)
Northern California	28%	23%	33%	23%
Southern California	6%	8%	2%	3%
Bay Area and Central Coast	9%	9%	2%	3%
Central Valley	41%	39%	16%	15%
California Statewide	18%	19%	7%	8%

129 Surface Transportation Board, 2013 STB Confidential Carload Waybill Sample, FAF 3, Ports of Long Beach and Los Angeles. STB 2015 Waybill Sample became available after Rail Plan analysis was complete.

Positive Train Control

The Class I railroads are implementing PTC largely at their own expense, and installation is well underway in California and elsewhere. However, PTC poses costly challenges to some short lines that are handling hazardous materials, or more commonly must operate over PTC-equipped Class I main lines. The \$100,000-plus cost of retrofitting older locomotives that are typical of short line fleets is beyond the financial ability of many carriers.

Freight Corridor Bottlenecks

In Northern California, substantial growth is expected along three primary trade corridors: Bay Area to Central Valley, Central Valley, and Central Valley to Reno. Primary trade corridors are also major intercity passenger rail corridors, and accommodating future train volumes will require additional capacity.

The lack of a connection between the UPRR Oakland and Niles subdivisions at the Niles Junction currently precludes use of Niles Canyon for expanded freight service. This area is an immediate priority that

supports the Alameda County and MTC efforts to improve goods movement in the Bay Area through dedicated rail freight improvements south of Oakland.

Significant intermodal- and international-related growth is expected along key trade corridors throughout Southern California. If projected train volumes materialize, accommodating passenger and freight rail will require additional capacity and separate freight and passenger track. Immediate priorities being pursued by the state that are in line with the Rail Plan include BNSF San Bernardino Improvements to unlock capacity made possible with completion of a Rosecrans Marquardt grade separation; and significant additional track capacity supporting significantly increased passenger service in the urban corridor between Los Angeles and Fullerton, and for freight movement out of Southern California.

Exhibit 2.6 below maps eight of the bottlenecks with the highest estimated daily freight train flows (listed as the last eight in **Table A.21** in Appendix A).

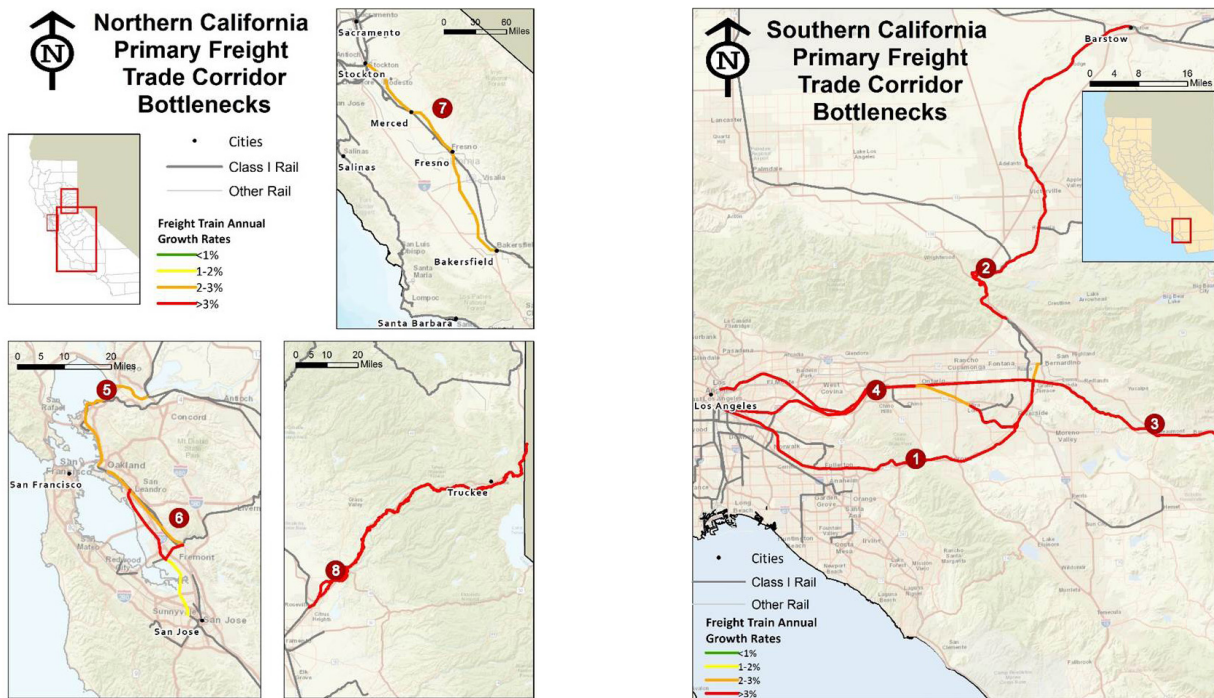


Exhibit 2.7: Heavy Freight Traffic Corridor Bottlenecks

1. BNSF San Bernardino (Los Angeles-San Bernardino via Fullerton and Riverside), 2. BNSF Cajon (Barstow to Keenbrook), 3. UPRR Sunset Route (Yuma Subdivision), 4. UPRR Alhambra and Los Angeles, 5. UPRR Martinez (Oakland to Martinez), 6. Southern Oakland Route (Oakland to Niles Junction), 7. BNSF Mainline Stockton to Bakersfield (San Joaquin Corridor), 8. UPRR Roseville to Reno over Donner Pass

2.1.4 Rail Line Abandonments

Rail lines are classified as abandoned when the STB has granted permission to remove a line from service, with no potential for operation in the foreseeable future. Subsequently, track materials are scrapped and the right-of-way is sold off, reverted to abutters, or “rail banked” for use as a transportation corridor in the future. Table 2.10 lists all of the STB abandonment filings in California since the 2013 Rail Plan was developed.^[130]

Miles of route proposed for abandonment changed sporadically from year to year, and short lines consistently submitted more abandonment requests than Class I railroads. Between 2005 and 2015, short-line railroad abandonment requests affected almost 201 miles, compared to only 105 miles attributed to Class I railroads. Among the abandonments commenced by Class I railroads, many were for industrial leads or other connectors to specific facilities and industries.

Table 2.10: Rail Line Abandonment Filings with FRA^[131]

Name	Year	Counties	Length
UPRR; SCVTA	2013	Alameda	1.97
UPRR	2013	Riverside; San Bernardino	1.27
Alameda Belt Line Railroad	2012	Alameda	2.61
UPRR; SCVTA	2012	Plumas; Lassen	8.95
BNSF	2012	Los Angeles	5.3
UPRR	2011	Riverside; San Bernardino	3.73
BNSF Railway	2011	Los Angeles	4.85



¹³⁰ A complete listing of abandonment filings in California since 2005 can be found in Appendix ____(?).

¹³¹ A complete listing of abandonment filings in California since 2005 can be found in Appendix ____(?).

2.1.5 Intermodal Facilities

Trains carrying containers and trailers represent one link in the multimodal supply chain that connects shippers with receivers; other links include container ships and trucks. Intermodal rail terminals are established to facilitate transfer of containers and trailers between modes (ship to rail, truck to rail, and vice versa). In California, the majority of intermodal traffic is associated with the Port of Oakland, POLA, and POLB; a sizable but smaller volume is related to traffic associated with the rest of the United States, Canada, and Mexico.

California's intermodal terminals are concentrated in the state's two largest metropolitan regions, which also host the state's largest port areas: the San Pedro Bay Ports in Southern California, and the Port of Oakland in the San Francisco Bay Area. Two intermodal facilities are in the Central Valley; these primarily serve the Central Coast and Central Valley regions, and are focused on domestic rail traffic, although they also handle international traffic transloaded into domestic equipment. Key characteristics of California's rail intermodal terminals are shown in Table 2.11. These facilities are defined as inland, on-dock, off-dock, or near-dock terminals. Containers can be loaded directly onto railcars from a ship at on-dock facilities. At off-dock and near-dock facilities, containers are first transported from the port terminals to the facilities. Off-dock facilities are more than 5 miles from the marine terminals, and near-dock are within 5 miles of the marine terminal. Rail intermodal service at the inland terminals consists of domestic trailers, domestic containers, and international containers moving between rail intermodal facilities on specialized rail cars.^[132]

Intermodal Terminal Needs

Growth in both domestic and international intermodal demand is expected to exceed available capacity at some locations, such as the San Pedro Bay Ports. Solutions will require reconfiguration of existing intermodal facilities; and potentially, construction of new ones. Recent experience has shown that such projects can be controversial—as was the case with BNSF's proposed Southern California Intermodal Gateway near the San Pedro Bay Ports—and therefore difficult to execute. In addition to addressing capacity constraints at existing locations, there is the opportunity to develop new intermodal services, including short-haul shuttles that transport international traffic from port areas to inland freight hubs. The State has an interest in these projects because of their relationship to the economic growth opportunities associated with intermodal rail, and because they contribute to increased use of rail in a manner that benefits the state's economy and environment through improved competitiveness, employment opportunities, and lower collateral impacts than would result from use of trucks.

Because of the environmental impact intermodal freight activity has on surrounding communities, technological development of cleaner rail equipment will be a key consideration in proposals to expand such activity. The State will look to incorporate clean technological practices in future project proposals.

Projections for continued growth in intermodal traffic indicate the need for substantial additional terminal capacity. Table 2.12 lists the proposed expansions by region that will result in a doubling of the current lift capacities of California's intermodal facilities. These include pending expansion plans for Lathrop, the Long Beach Intermodal Container Transfer Facility (ICTF), and POLA/POLB on-dock intermodal facilities. Two new facilities are also being considered: the Oakland Outer Harbor Rail Intermodal Yard and the Southern California International Gateway at POLA.

Table 2.11: Intermodal Terminal Facility Characteristics ^{[133][134]}

Location/Name	Serving Carrier(s)	Facility Type	Current Cap.(Lifts)
Central Valley			
Lathrop	UPRR	Inland	270,000
Stockton/Mariposa	BNSF	Inland	300,000
Bay Area			
Oakland International Gateway (OIG)	BNSF	Near-dock	300,000
Railport-Oakland	UPRR	Near-dock	450,000
Southern California			
East Los Angeles	UPRR	Inland	650,000
San Bernardino	BNSF	Inland	660,000
ICTF, Long Beach	UPRR	Near-dock	760,000
City of Industry	UPRR	Off-dock	232,000
Hobart	BNSF	Off-dock	1,700,000
Los Angeles Transportation Center	UPRR	Off-dock	340,000
POLA/POLB On-Dock Intermodal Facilities	UPRR, BNSF	On-dock	2,257,775
TOTAL			7,919,775

Table 2.12: Current versus Proposed Future Capacities ^[135]

	Yard Capacity (Lifts)	Future (Lifts)	Increase (Lifts)
Central Valley	570,000	1,030,000	460,000
Bay Area	750,000	1,150,000	400,000
Southern California	6,600,000	12,260,000	5,660,000
TOTAL	7,200,000	14,440,000	6,520,000

133 Does not include intermodal facilities that are captive to a single shipper.

134 Sources: California State Rail Plan (2013); Oakland Army Base Rail Master Plan Report (2012); Manteca Bulletin: UPRR expansion may take up to 40 years (2015); Journal of Commerce: Railroads Expand ICTF Capacity; Southern California International Gateway Recirculated Draft EIR (2012).

135 Sources: California State Rail Plan (2013); Oakland Army Base Rail Master Plan Report, 2012: UPRR expansion may take up to 40 years; Manteca Bulletin (2015); Journal of Commerce: Railroads expand ICTF Capacity; Southern California International Gateway Recirculated Draft EIR (2012).

Carload Yards

For carload service, carriers operate a variety of yards to collect, distribute, and sort traffic, similar to the way a hub and spoke system works for large airlines. Most common are industry yards, which handle incoming and outgoing traffic from nearby rail customers. These yards are located throughout the state, on Class I railroads, as well as some of the short lines. Regional yards process traffic associated with larger geographic areas, consolidating and

dispatching traffic to and from industry yards, as well as local industries. Largest in terms of size and volume are system yards, which sort or “classify” traffic by a carrier’s major traffic lanes. In California, there are three system yards. UPRR operates two—one in Roseville and the other in West Colton—which process carload traffic for the northern and southern parts of the state, respectively. BNSF’s Barstow Yard processes most of BNSF’s manifest traffic for the entire state.^[136]



Intermodal freight being loaded at POLB

136 Caltrans, 2013 California State Rail Plan (2013).

2.1.6 Safety and Security

Like all transportation systems, freight and passenger rail operations face safety and security challenges.

Rail-related safety incidents range from minor injuries to fatalities, which can occur due to at-grade crossing conflicts, trespassing on railroad property, pedestrian conditions, human error, and other deficiencies. Where deficiencies exist, safety risks can be mitigated through a combination of programs, such as public education campaigns. The California Operation Lifesaver Incorporated program, for example, administers an outreach program to share a rail safety message with the public, K-8 students, emergency responders, and professional drivers. Sometimes safety risks can be improved through track and signal upgrades, gate and warning system activation, and grade separations when practicable.

The safety and security of railroads is regulated by federal and state law, and enforced by a variety of federal and state agencies. Funding of critical safety improvements is administered through a variety of federal and state programs.

Regulatory Agencies

Federal rail safety regulators include:

- **The FRA Office of Railroad Safety**, which conducts safety inspections, collects and analyzes accident data, and enforces existing safety laws and regulations. A Passenger Rail Division in the Office of Safety develops passenger-rail-specific safety programs and initiatives, and enforces safety policies, regulations, and guidance for commuter, intercity, and HSR.
- **Transportation Security Administration**, which oversees Amtrak and commuter rail system security by monitoring stations and infrastructure, and identifying and mitigating potential security risks to both passengers and cargo.
- **National Transportation Safety Board**, which investigates and reports on all passenger railroad fatalities or property damage.

State rail safety regulators include:

- **CPUC**, which helps enforce federal safety and security regulations; conducts design safety reviews of crossing projects; investigates railroad accidents; regulates safety and security

at transit crossings and stations; and responds to safety-related public and agency inquiries. The CPUC also hires railroad safety inspectors to supplement FRA's regional inspectors. In addition to safety regulation, the CPUC has authority over the construction and/or modification of existing crossings and grade separations.

- **Caltrans DRMT**, which inspects state-owned rail equipment and facilities; funds safety improvements; and is a partner in safety education and awareness programs.
- **Pipeline and Hazardous Materials Safety Administration (PHMSA)**, which regulates the rail transportation of materials that are poisonous by inhalation and carried in tank cars.
- **California Office of Emergency Services (Cal OES)**, which coordinates preparedness for and response to natural and manmade disasters; and administers transit security grants to intercity passenger rail and commuter rail systems.

Safety Regulations

Regulations aimed at improving rail system safety include the following:

Highway Rail-Grade Crossing Safety Action Plans

The Rail Safety Improvement Act (RSIA) of 2008 requires 10 states, including California, to prepare and submit plans to prioritize specific highway rail grade crossing improvements so that resources will be invested where the greatest improvements in safety are anticipated. California has a plan filed with FHWA, as required by RSIA California's action plan, that identifies specific solutions for improving safety at railroad and rail transit crossings in California. It includes development of a comprehensive rail-crossing inventory database, and implementing data-driven, risk-based project selection methodologies for Section 130 and other grade-crossing safety funding programs. The State will continue to work closely with its federal and local agency partners to implement the identified strategies, and will continue on an ongoing basis to review and update the plan as strategies evolve. The CPUC is in the process of revising the plan by June 2019.

Crude Oil Safety

Much of the concern regarding increased shipments of crude oil by rail is focused on safety and environmental impacts. Incidents involving oil by rail in California increased from three in 2011 to 25 in 2013.^[137] Railroad safety regulation is primarily a federal responsibility, and the United States Department of Transportation (U.S. DOT) has moved to adopt new safety and operational practices. Notably, this includes a new specification for a safer tank car (U.S. DOT 117), hazmat reporting requirements, and more stringent regulations on certain operating practices. In California, the State has responded with some new requirements and regulations, including the CPUC's Crude Oil Reconnaissance Team, whose duty is to monitor, assess, and solve any risks involved in future crude oil projects.

SB 730 – Two-Person Train Crew Requirements

SB 730 was signed into law in early September of 2015. The bill requires that at least two persons operate all freight trains and light-engine movements. The safety impacts from differing crew sizes are a matter of considerable debate. At this time, most freight operations are conducted with two-person crews, but Amtrak and other passenger operators, as well as some short lines, frequently have only one operator in the cab.

2.2 Infrastructure Constraints

Section 2.1 (and the corresponding sections of Appendix A) inventoried existing passenger and freight rail services, identified rail capacity issues, and outlined infrastructure needs. Some of the state's immediate deficiencies include:

- At-grade crossings,^[138] track curves,^[139] surrounding land uses,^[140] or speed limits that require trains to travel at slower speeds;^[141]
- Facilities and existing rail-related infrastructure, such as stations that are too small^[142] or require reversing maneuvers,^[143] or bridges that are at capacity;^[144]
- Insufficient numbers and insufficient capacities of rail cars;^[145] and,
- Insufficient numbers of tracks or passing sidings.

In addition, existing peak-period congestion issues affect several components of the rail system. Caltrain, in particular, already operates at or near capacity during peak period.^[146] The Peninsula Corridor in the Bay Area will continue to experience high rail demand as job growth concentrates in San Francisco and Silicon Valley. These near-term needs will necessitate new infrastructure investments.

In addition to short-term challenges to addressing existing deficiencies, increased future demand will further stress the overburdened system. The Statewide Rail Market Analysis Tool provides

138 In Stockton, an at-grade crossing between two major freight routes poses a challenge to *San Joaquin* operations (I 20).

139 Sharp curves at Rose Canyon limit the *Pacific Surfliner* to 65 mph (I 51).

140 *Capitol Corridor* must operate at slower speeds north of the Berkeley/Oakland station due to the proximity of the freeway. There also is limited capacity for trains terminating in Berkeley/Oakland (I 32).

141 There is a speed limit of 50 mph for *Capitol Corridor* trains between Auburn and Sacramento (I 32).

142 Van Nuys is an example of a station where the *Pacific Surfliner* has only one platform, but expansion is difficult due to ownership rights (I 48).

143 The East Ventura station requires a reversing maneuver to access the platform (I 48).

144 The lifting bridge over Suisun Bay in Martinez is not large enough, and requires the *Capitol Corridor* to reduce speeds (I 32).

145 Capacity on the *Pacific Surfliner* is constrained during holidays and other peak-service periods (I 83).

146 Some of these capacity issues may be addressed in the Caltrain Modernization Program.

137 FRA, CA Crude Oil by Rail Shipments and Railway Accidents, 2015. Accessed 2015.

estimates of 2040 travel demand by rail corridor, with some corridors expecting an increase in person trips by more than 30 percent. The Rail Plan's capacity analysis examined each segment under projected conditions in 2040. The analysis made assumptions about future operating characteristics, and identified the necessary infrastructure improvements to address the projected capacity needs. The combination of projected freight and passenger traffic growth in the primary corridors of California's rail network will result in bottlenecks that will impede the efficient flow of traffic. The potential improvements range from simple, minor infrastructure upgrades to more complex and costly investments, including but not limited to:

- Improved signaling and turnout switch controls;
- Improved/new sidings;
- Electrification;
- Double-tracking, triple-tracking, and overtake sections;
- Grade separations; and
- Line speed improvements.

2.2.1 Freight Rail Constraints

Most critical to maintaining the viability of California's freight rail system is ensuring that there is adequate capacity on the core network to maintain or improve rail's competitiveness with trucks. As noted previously, insufficient capacity that leads to congestion and higher costs will impact the railroad's ability to compete, and may shift traffic away from rail. Most of the potential congestion impacts are on joint passenger and freight facilities, with the attendant potential conflicts from the varying demands of passenger and freight services. As passenger rail service is expanded, adequate capacity must be provided for current and future freight rail needs. These needs may include not only through services, but also industrial access and the attendant local switching.

Hazardous Material Transport

For many years, the railroad and chemical industries and U.S. DOT have been actively engaged in improving the safe transport of hazardous materials

by rail. Substantial progress was made in the design of and materials used in tank cars, reporting, custody, education, communications, and safe handling. In May 2015, the FRA and the PHMSA issued updated safety regulations related to transporting flammable liquids by rail. These regulations include a tank car standard, U.S. DOT 117, that incorporates enhanced tank head and shell puncture-resistance systems, and enhanced top fittings protection. California is actively pursuing preventative and emergency response measures to improve the safety of crude oil and hazardous materials shipments, especially in track and hazardous materials inspection and grade-crossing improvements.

Grade Crossings

The federal Section 130 program has been an ongoing source for investments in grade-crossing improvements underway or pending on the state's primary network. Caltrans and CPUC have a partnership with railroad companies and local road agencies. CPUC engineers assigned to various counties review the crossings in their respective territories and nominate crossings for the Section 130 program. There is a need to strengthen partnership between state and railroad operators, particularly among short lines that must bear a portion of the cost of maintaining crossing warning devices. Additional funds from federal and state sources could help address some of these concerns.

The CPUC and Caltrans also administer the Railroad Crossing Automatic Warning Device Maintenance Fund, which provides funds to railroads for the local government's share of the costs of maintaining automatic warning devices at highway-rail crossings. This program helps with a portion of the cost of maintaining crossing warning devices.

2.2.2 Other Constraints

Even with a clearly defined and well-supported rail vision, there are constraints to service implementation. Existing infrastructure and land uses—such as rail operating in dense urban places, along sensitive environmental areas, or in similarly challenging locations—sometimes can only be resolved by major and expensive overhauls. Corridors that are jointly used by multiple public and private owners or jurisdictions also may pose a coordination challenge to future projects and

integration efforts. A plurality of demands for the rail system is a challenge; even the most well-integrated state rail system will be unable to serve all locations or with the same service levels. Instead, greater integration is meant to maximize rail service and benefits. Funding is another important constraint to future system preservation and enhancement.

Furthermore, even when technically feasible and well funded, efforts to improve passenger service rail may be hindered without appropriate policies, contracts, and coordination efforts. This Rail Plan, which brought together service providers throughout the state, outlines policy goals to meet the Plan's vision for the more integrated system. It also follows the policies and recommendations established by the CTP 2040 for rail's role in the broader multimodal system.

2.3 Conclusion

California's existing rail system is extensive and complicated and boasts some of the most popular and well-traveled rail lines in the United States. Rail offers an alternative to driving for residents, employees, visitors, and businesses alike. The coordination between intercity rail, commuter rail, urban rail, and other connecting services such as Amtrak Thruway buses, provide access to a statewide network. This existing system is critical to the success of future rail travel and rail planning in California. Chapter 3 details the Rail Plan vision for an integrated passenger and freight rail network, including opportunities to improve the multimodal transportation system by creating a viable, efficient, sustainable, and enjoyable alternative to automobile travel.



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