Solano Rail Facilities Plan Update

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transportation / strategy / facilitation

with

RailPros

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Professional Engineering & Survey

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DRAFT

FINAL PLAN

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LIST OF EXHIBITS

INTRODUCTION

The consultant team for the Solano Rail Facilities Plan Update 2015 was charged with five technical tasks:

Task 1. Demand for Freight Rail

Task 2. Capitol Corridor - Review and Update the 1995 Plan

Task 3. Rail Infrastructure and Safety

Task 4. Napa-Solano Rail Connections

Task 5. Final Solano Rail Facilities Plan Update

Each task was originally presented in an individual technical memorandum.

The Plan Update involved reviewing several previous source documents and, where appropriate and feasible, updating these for the current plan:

- The 1995 Solano Rail Facilities Plan
- The 2012 Solano Rail Crossings Study
- The 2003 Napa-Solano Passenger Rail Study

The Plan Update looks ten years ahead. The short-medium term outlook of the plan reflects the desire by the sponsoring agencies to identify improvements that are reasonable, realistic and potentially eligible for funding within known programs. There are also developments impacting the rail facilities of Solano County and investments in facilities that will be more likely to occur beyond the 10-year horizon. These are identified where relevant throughout the document.

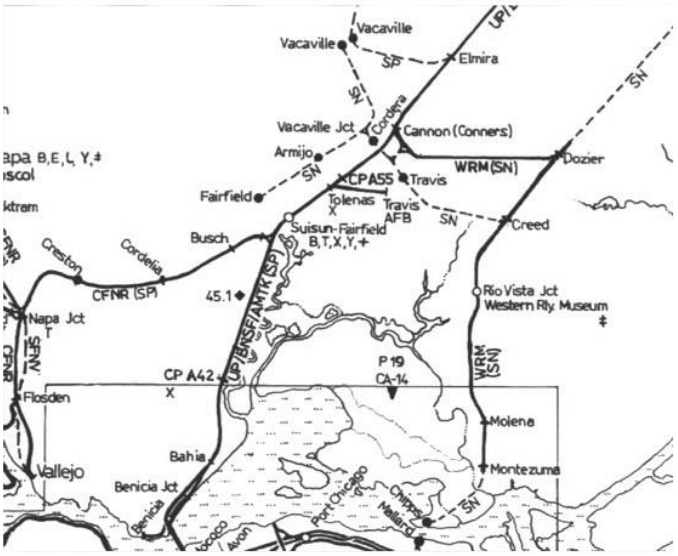
Other relevant planning efforts were also underway concurrent with the update of this plan. These included:

- Regional Goods Movement Study (sponsored by MTC)
- Priority Development Area (PDA) plans, most of which where just being initiated while this plan was being prepared.

Where appropriate, the rail facilities plan team coordinated their assumptions with these broader regional efforts.

This plan represents the consolidation of the technical memos. Background data for the technical memos is presented in the appendix.

Solano Rail Facilities Plan Update



Chapter 1

DEMAND for FREIGHT RAIL

1 DEMAND FOR FREIGHT RAIL

1.1 BACKGROUND TO FREIGHT RAIL DEMAND

This is the first of the technical tasks in the Plan Update. Its purpose is to describe the demand for freight rail, to determine whether current facilities are adequate for that demand and determine the requirements for enhancements or expansion of freight rail capacity in Solano County.

The capacity of the core freight rail network is also shared extensively with passenger services in the County. Therefore, in this chapter the potential facility improvements relate primarily to future freight demand needs. The passenger and infrastructure chapters include the comprehensive list of improvements. Since there is some overlap with the update to the Napa-Solano passenger study, connecting freight rail services to Napa County are also referenced in this chapter.

The horizon for the freight rail demand task, as for the plan as a whole – is 10 years, i.e. 2025.

Methodology

The methodology employed a multi-step process to determine the potential demand for rail infrastructure facilities:

- **Step 1**: Identify current and future 10-year activity from current freight rail served businesses (RSBs)[1]
- **Step 2**: Identify former RSBs with unused/mothballed freight rail connections that could be reactivated
- **Step 3:** Identify locations for future RSBs that are zoned for rail-appropriate industrial uses (manufacturing and rail-served distribution, primarily) either located trackside or with a potential for near connection to the network
- **Step 4**: Overlay the current, former and future RSB level of rail demand at a site level with published industry forecasts for the commodities that currently travel by rail within the County
- **Step 5**: Compare the demand picture developed in steps 1 through 4 demand with current facility and network capacity and identify major bottlenecks/pinch points within the current and committed rail infrastructure

It should be noted that for reasons of commercial privacy, the consultant team used industry and current County rail infrastructure knowledge, operator contacts, site visits, and input from individual planning and business interests on future development sites to develop an aggregate picture of capacity across the Solano freight rail network. Individual business site-level data will not be published.

1.2 CURRENT FREIGHT RAIL NETWORK IN SOLANO COUNTY

There are three freight operators in Solano County (and for the purposes of the Plan Update, one in Napa County):

[1] The term rail served business (RSB) is used here in place of the traditional industry term “shipper” so that the rail plan can capture not only current businesses shipping both inbound and outbound by rail, but former or currently dormant businesses that have (and could again) ship freight by rail.

Class I:
Union Pacific Railroad
Shortline:
California Northern Railroad
Napa Valley Railroad

These are summarized on Map A: Solano County Freight Rail Network.

1.2.1 Class I

Union Pacific Railroad

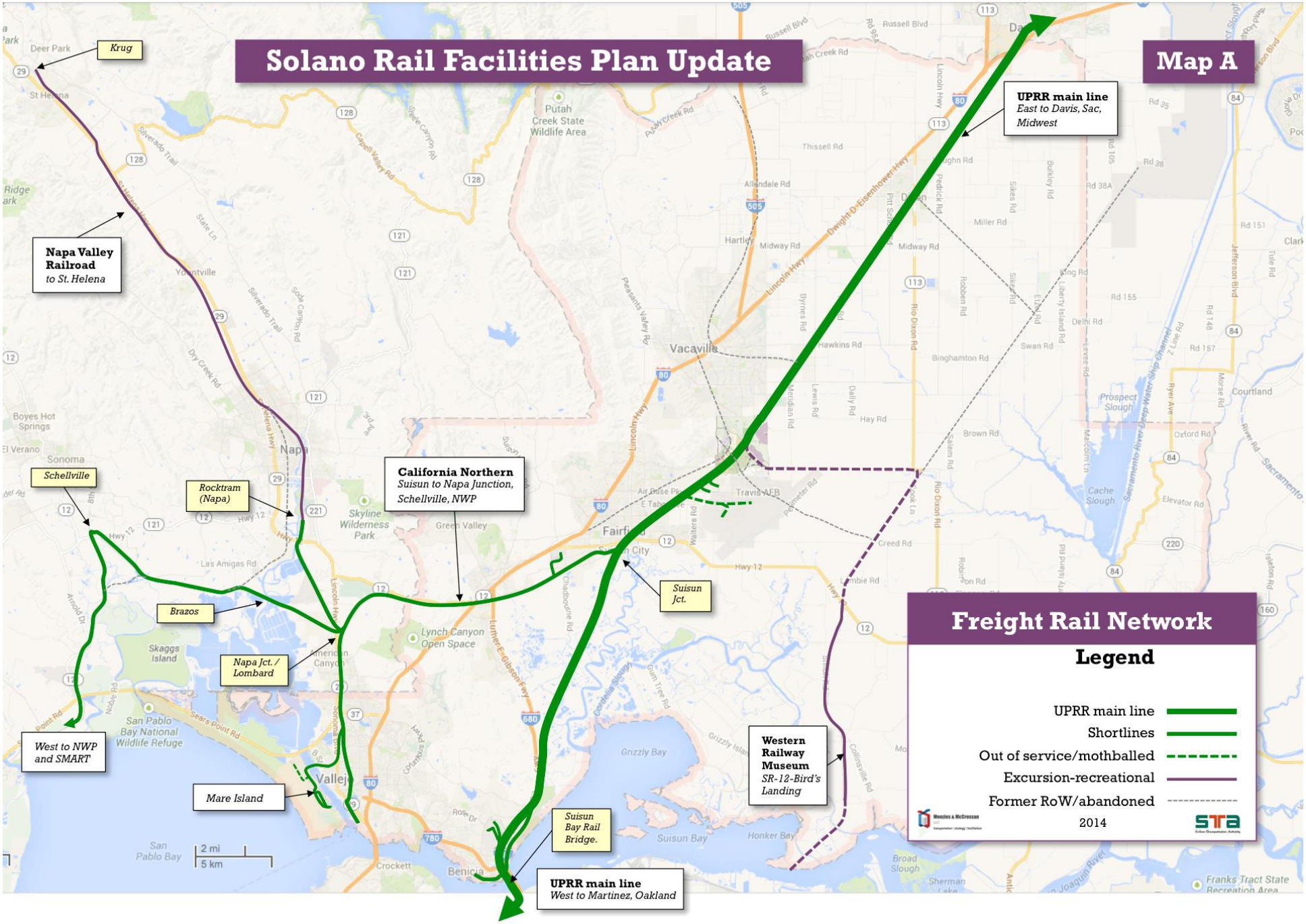
Union Pacific Railroad (UPRR) provides the majority of freight rail service in Solano County, both in terms of traffic volume and miles of rail line (41 out of 55 main line track miles). Headquartered in Omaha, Nebraska, UPRR's rail network extends to 23 states. Construction of today's route through Solano County commenced in the late 1870s by the California Pacific Railroad and was completed by the Central Pacific Railroad, which eventually became part of the Southern Pacific. In 1996, Southern Pacific was merged into the Union Pacific. UPRR operates approximately 41 miles of route in Solano County, with most of their main line comprised of two parallel, closely spaced tracks. UPRR's route through Solano County provides the most direct access linking the Port of Oakland with eastern destinations.

From the south, UPRR's route through Solano County begins, at the Solano/Contra Costa county line in the middle of the Carquinez Strait. UPRR owns and operates the nearly 1-mile long Benicia Railroad Bridge, which includes a lift span to allow vessel traffic to pass. With tracks over 70 feet above the water level, one UPRR track employs a low-grade route, paralleling I-680, as it descends toward the prevailing ground level north of Benicia Industrial Park (this is the track on the viaduct adjacent to I-680 just north of the Benicia Bridge).

This track is generally used for heavy freight trains destined for Oakland, since it is easier for heavy freight trains to climb the gentler grade. The other track is descends from the bridge much more steeply and also provides access to the Benicia Industrial Park, AmPORTS, and Valero refinery..

From Benicia, the UPRR route extends northward across the Suisun marshland before reaching the City of Suisun City, where the junction with the rail line to Vallejo, Napa, and Sonoma (operated by California Northern Railroad) is located. Several industries are located along the railroad at Suisun City and the western edge of Fairfield, with Anheuser Busch (a division of AB InBev), the Sheldon United propane distribution facility and Amcor Plastics. Through Suisun City and Fairfield, there are only four at-grade crossings: Cordelia Road, Sunset Avenue, East Tabor Avenue, and Peabody Road.

North of Suisun City, near the Peabody Road grade crossing (site of a proposed grade separation and new station for the Capitol Corridor Joint Powers Authority (CCJPA), the UPRR route passes by the Tolenas Industrial Park, site of 8 current and 2 former rail served businesses.


Solano Rail Facilities Plan Update
Map A
Krug
Napa Valley Railroad
to St. Helena
UPRR main line
East to Davis, Sac, Midwest
Schellville
Rocktram (Napa)
California Northern
Suisun to Napa Junction, Schellville, NWP
Suisun Jct.
Brazos
Napa Jct. / Lombard
West to NWP and SMART
Mare Island
Suisun Bay Rail Bridge.
UPRR main line
West to Martinez, Oakland
Western Railway Museum
SR-12-Bird's Landing
Freight Rail Network
Legend
UPRR main line
Shortlines
Out of service/mothballed
Excursion-recreational
Former RoW/abandoned
2014
Napa
Vacaville
Fairfield
Suisun City
Benicia
Vallejo
Crockett
Travis AFB
Putah Creek State Wildlife Area
Skyline Wilderness Park
Lynch Canyon Open Space
San Pablo Bay National Wildlife Refuge
Grizzly Bay
Suisun Bay
Honker Bay
Cache Slough
Prospect Slough
Courtland
Franks Tract State Recreation Area
2 mi
5 km

Just north of Peabody Road, near the Cannon Road crossing, is the junction with the branch line (former Sacramento Northern) owned by the Western Railway Museum (WRM). This line currently has no freight traffic, although WRM runs its own maintenance-of-way trains at the more active eastern end of the line (south of SR-12).

Continuing towards Sacramento, the railroad extends northeasterly through a predominantly agricultural area, along the south edge of the City of Vacaville, through the unincorporated community of Elmira, and through the City of Dixon. Beyond Dixon, it crosses Putah Creek on a long, low steel bridge before leaving Solano County and entering Yolo County. Between Vacaville and the Yolo County line, UPRR has 19 rural at-grade crossings, all equipped with active warning devices and gates.

1.2.2 Shortlines

California Northern Railroad

The California Northern Railroad (CFNR) is a shortline based in Napa Junction and owned by the holding company Genesee and Wyoming (G&W), which is headquartered in Jacksonville, Florida. CFNR provides service between the City of Suisun City (the junction with UPRR), the City of American Canyon, Lombard (near American Canyon), the City of Napa, and the City of Vallejo. Together, these lines comprise approximately 27 route miles of railroad. CFNR's route from Suisun City includes the Thomasson Tunnel under Cordelia Hill, a bridge over Interstate 80, and a steep grade in both directions through American Canyon, roughly paralleling Highway 12. Historically, the grade through American Canyon was an operating constraint, requiring extra locomotives for anything but short trains. At the western side of American Canyon is the Napa Junction. CFNR also operates railroads between Davis and Tehama and between Tracy and Los Banos.

Napa Junction is the confluence of the route to Suisun City, the route that extends westward to Lombard and Brazos Junction, the interchange with the Northwestern Pacific Railroad (NWP). This is also the junction with the CFNR route northward approximately 7 miles, through the former Napa Pipe factory, and to the interchange with the Napa Valley Railway (operator of the Napa Valley Wine Train) at Rocktram in Napa. CFNR also operates the route between Lombard and Schellville, although CFNR has assigned operating rights to this segment to the NWP; thus, interchange between NWP and CFNR is effected at Lombard.

The line southward from Napa junction extends through 20 at-grade crossings and through a residential area, to the former General Mills site, which is proposed for future industrial development. A second line, previously operated by Mare Island Rail Service (MIRS), extends from the intersection of Sereno Drive and Broadway, through commercial and residential areas, across the Mare Island Strait on a lift bridge (shared with auto traffic) and onto Mare Island, the grounds of the former Navy Base. The former Navy Base trackage on Mare Island is largely located in roadways and features sharp curves to various spur tracks. The City, which has a track use agreement with CFNR, controls the track from Sereno Drive and Broadway to just inside Mare Island.

Note that Napa Junction, American Canyon, Lombard, and Napa, as well as the entirety of the territory served by the Northwestern Pacific Railroad and Napa Valley Railway are all outside of Solano County; however, these other railroads have their only connection to the "outside world" via the CFNR and the junction with UPRR. Via agreements with other railroads, UPRR, and CFNR, customers on Mare Island can receive service from/to nearly any rail-served shipper in the US, Canada, or Mexico.

Napa Valley Railroad

The Napa Valley Railroad (NVRR) operates approximately 19 miles from their interchange with the CFNR along the Napa River (at Rocktram) northward to St. Helena. The southern 2 miles of the railroad extend northward through Napa and under Highway 29. The majority of the railroad is immediately west of Highway 29, though the northernmost 4 mile section (at St. Helena) is along the east side of the Highway.

The railroad has many grade crossings – every public and private road that has an intersection along Highway 29 has a grade crossing with the railroad immediately adjacent to the intersection. Note that while NVRR is entirely in Napa County, its rail access to the rest of the nation's rail network is via the CFNR and UPRR through Solano County.

1.3 RAIL SERVED BUSINESS (RSB) FACILITIES

1.3.1 How Rail Served Businesses (RSBs) are typically served

A brief explanation all how these businesses are served will help in understanding of the potential need for new facilities as patterns of demand change over the 10-year period of the Plan Update.

Unit trains are comprised entirely of goods shipped from a single origin to a single destination. Automobiles, for example, move in unit trains, with the origin being the factory in the Midwest and the destination being the AmPORTS facility at Benicia. Unit trains avoid intermediate switching and are thus very efficient, thereby allowing railroads to offer a premium service to customers.

Manifest trains move carload traffic in small groups of railcars, generally on the order of 1 to 10 cars at a time, in trains comprised of many different types of railcars. Each railcar or group of railcars within a manifest train may have a different destination. The individual carloads are gathered together at one location (a switching yard) until sufficiently large groups comprise an entire train. The time required to assemble a train is dependent upon the volume and timing of loaded railcars offered by multiple shippers.

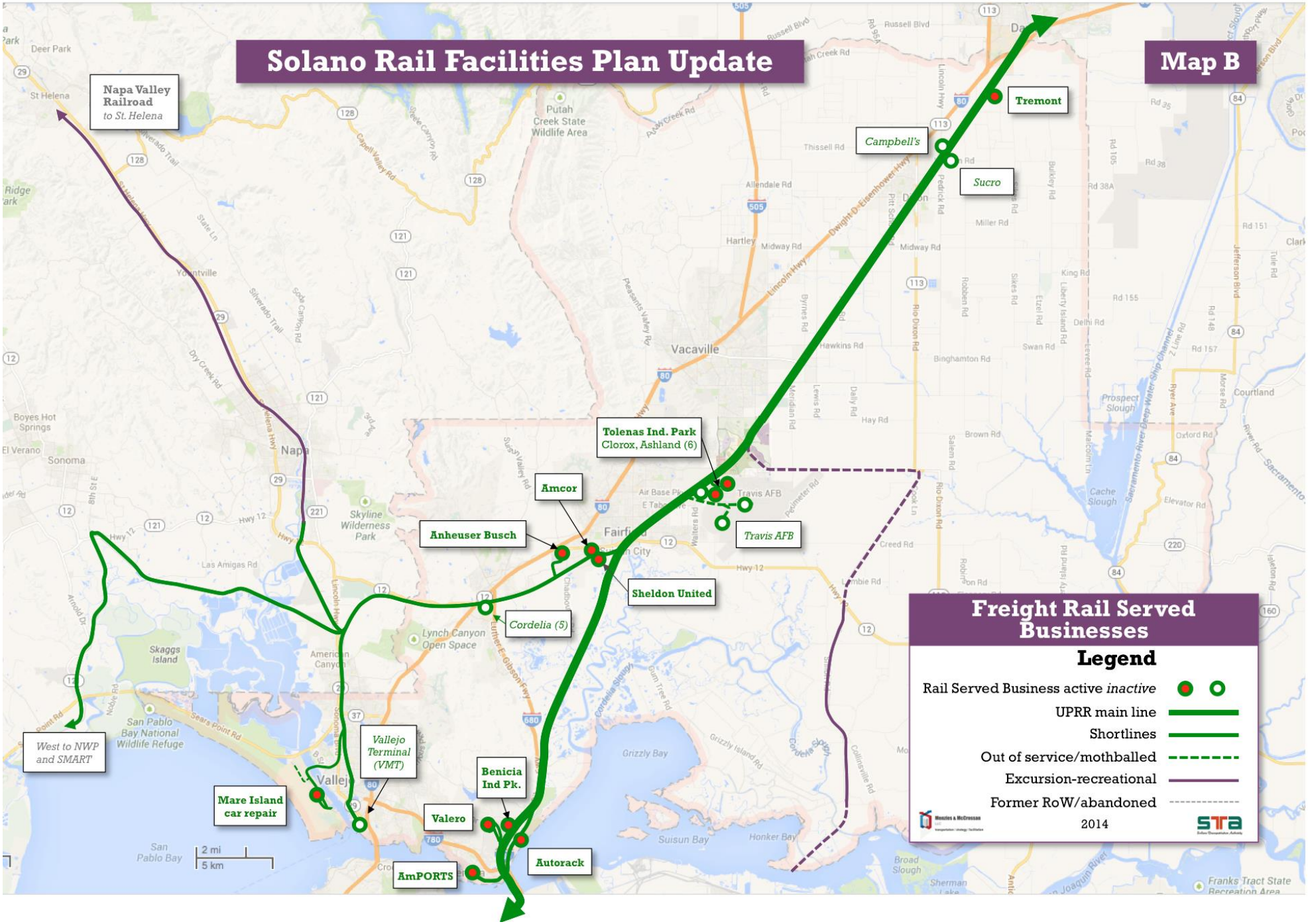
Once a full train of cars is available, it is dispatched to a location – typically another large railyard – on the route to the destination of most of the cars in the train. At that railyard the cars are sorted into smaller groups for local delivery, or for assemblage into another train for forwarding to their final destination. Carload traffic traveling in manifest trains requires more time to reach its destination compared to unit train service.

1.4 INDIVIDUAL RAIL SERVED BUSINESS (RSB) FACILITIES PROFILES

The full list of current and recently served (since 2000) former RSBs (from East to West across the County) is shown in Fig. 1.

Map B summarizes current RSB facilities, both active and inactive.

Following the table is a summary profile of each of the major rail served businesses (RSBs) in Solano County, outlining the diversity of enterprises that use rail and the locations where they are concentrated.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Map B
Napa Valley Railroad
to St. Helena
Tremont
Campbell's
Sucro
Tolenas Ind. Park
Clorox, Ashland (6)
Amcor
Anheuser Busch
Travis AFB
Sheldon United
Cordelia (5)
West to NWP and SMART
Vallejo Terminal (VMT)
Mare Island car repair
Benicia Ind Pk.
Valero
Autorack
AmPORTS
Freight Rail Served Businesses
Legend
Rail Served Business active inactive
UPRR main line
Shortlines
Out of service/mothballed
Excursion-recreational
Former RoW/abandoned
2014
Vacaville
Napa
Fairfield
Travis AFB
Vallejo
Suisun Bay
Grizzly Bay
Honker Bay
Lynch Canyon Open Space
Skyline Wilderness Park
San Pablo Bay National Wildlife Refuge
Putah Creek State Wildlife Area
Cache Slough
Prospect Slough
Sacramento River Deep Water Ship Channel
2 mi
5 km

Figure 1 Solano County Rail Served Businesses (RSBs) Summary 2015 (listed East-West)

RSB Name	Active/ *inactive / future*	RSB Rail Facility Jurisdiction	Inbound / Outbound Primary	Primary Rail Traffic / Commodity
Tremont Supply Co (Dixon)	✓ **active**	Solano Co/ Dixon	outbound	ag product
Campbell Soup Supply Co	*inactive*	*Solano Co/ Dixon*	outbound	*food/bev product*
Sucro-Dixon	*inactive*	*Solano Co/ Dixon*	outbound	ag product
Tolenas Bus Park Clorox	✓ **active**	Fairfield	outbound	bulk liquid chemical
Tolenas Bus Park Ball Metal Beverage	✓ **active**	Fairfield	outbound	bev container
Tolenas Bus Park Macro Plastics	✓ **active**	Fairfield	outbound	plastic raw materials
Tolenas Bus Park Goodyear	✓ **active**	Fairfield	outbound	rubber product materials
Tolenas Bus Park Nexeo Solutions	✓ **active**	Fairfield	outbound	bulk liquid chemical
Tolenas Bus Park Sunpol Resins	✓ **active**	Fairfield	outbound	bulk liquid chemical
Tolenas Bus Park Compu-Tech Lumber	✓ **active**	Fairfield	inbound	dim lumber
Tolenas Bus Park Frank-Lin Distillers	✓ **active**	Fairfield	inbound	beverage product
Tolenas Bus Park Rexam	*inactive*	*Fairfield*	inbound	*bev container*
Travis AFB	*inactive*	*Fairfield*	inbound	*avgas/DOD*
Anheuser Busch	✓ **active**	Fairfield	inbound	beverage production supply
Sheldon United Terminal	✓ **active**	Fairfield	inbound	propane
Amcor Rigid Plastics	*inactive*	*Fairfield*	inbound	*plastic raw materials*
Jensen Precast Building Systems (fmr Fibrebond)	*inactive*	*Fairfield*	*n.a.*	*n.a.*
West Cordelia (North bay Auto Auction)	*inactive*	*Fairfield*	*n.a.*	*n.a.*
West Cordelia (White Cap Construction Supply)	*inactive*	*Fairfield*	*n.a.*	*n.a.*
West Cordelia (fmr. Glass Pak)	*inactive*	*Fairfield*	*n.a.*	*n.a.*
West Cordelia (Dependable Plastics)	*inactive*	*Fairfield*	*n.a.*	*n.a.*
Valero Benicia	✓ **active**	Benicia	inbound	refined petroleum products
Benicia Ind Park Terminal Biagi Bros	✓ **active**	Benicia	inbound	beverage product
Benicia Ind Park Coca-Cola Enterprises Inc.	✓ **active**	Benicia	inbound	beverage product
AmPORTS Auto rack	✓ **active**	Benicia	inbound	finished autos
AmPORTS Benicia Port Terminal	✓ **active**	Benicia	inbound	petroleum feedstocks
Vallejo Mare Island Terminal	✓ **active**	Vallejo	inbound	railcars
Vallejo Marine Terminal	*inactive/ future*	*Vallejo*	*future outbound*	*grain (future cement product)*

Benicia: Valero Refining

Valero is one of the largest industries in Solano County and also one of the largest users of rail service. Some feedstock and some refined products are transported to and from the refinery by rail, mostly in railroad tank cars, on a daily basis. Note that the vast majority of the feedstock is crude oil. Ships that dock at a dedicated wharf in Benicia currently transport this crude. The tracks accessing Valero are well off the main line, providing the opportunity for switching service uninterrupted by main line trains. Valero has a proposal to shift its crude oil traffic volume to rail: this is considered in more detail in section 1.6.

Image: Google 2014

Benicia: AmPORTS

AmPORTS is the operating entity for the automobile terminal at Benicia. This facility consists of dock space, vehicle inspection and preparation areas, vehicle storage space, and areas for loading vehicles onto railcars. AmPORTS is the distribution hub for Ford and Chrysler vehicles, and is also the receiving port for imported Toyota vehicles. Domestic automobiles arrive by railcar and are generally transported to Northern California by truck. Imported vehicles are received from ships and transported to inland destinations by truck (for Northern California destinations) or railcar (for destinations throughout the western US).

The level of rail service to the AmPORTS facility is dictated by the demand for automobiles and, in the case of autos handled by both ship and rail, also by ship schedules. Benicia competes with other West Coast locations for automobile imports, and volumes can rise and fall based on contract status. Benicia is, for example, currently the beneficiary of imports that have been switched from the Port of Richmond, lifting current automobile volumes 20% over the past three years. However, when shipped by rail, automobiles are always moved in unit trains consisting exclusively of auto carrier cars. Like Valero, the tracks serving AmPORTS are located well away from the main line, providing the opportunity for switching service uninterrupted by main line trains.

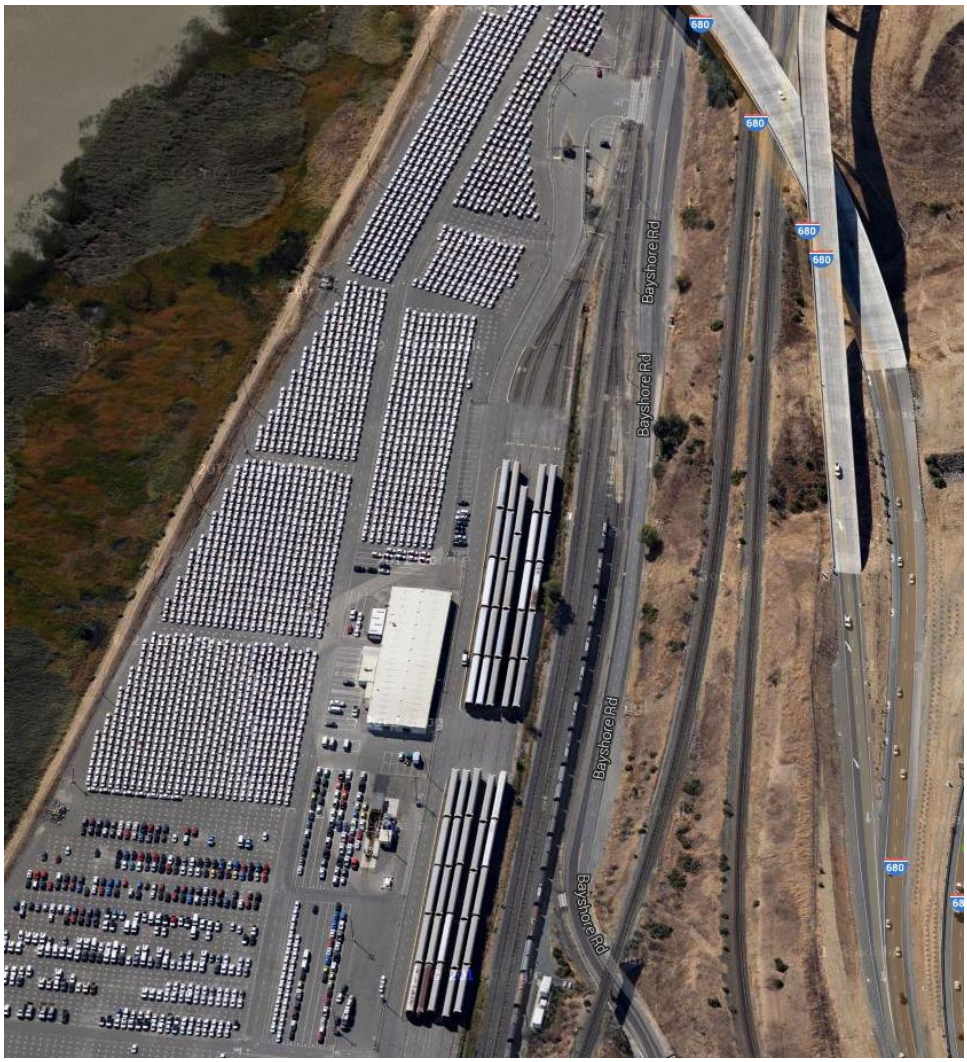


Image: Google 2014

Benicia Industrial Park

Benicia Industrial Park caters to distribution and transloading needs for several firms, mainly in the beverage/bottling sector. Biagi Brothers is a trucking and transload firm located in the Benicia Industrial Park. They receive beer and wine deliveries from Mexico via railcar and transload those goods into trucks for delivery to regional distribution centers or wholesale or retailer warehouses. Railcar deliveries to Biagi Brothers are in boxcars, with frequent service to their location. Biagi Brothers is located well away from the main line, and thus can be switched uninterrupted.

Other occasional customers at the industrial park include Bruni Glass packaging, one of the larger suppliers of glass for the Northern California wineries, and Coca-Cola bottling. Many more warehouse facilities in the industrial park have rail connection but the needs of customers change with turnover in tenancy.

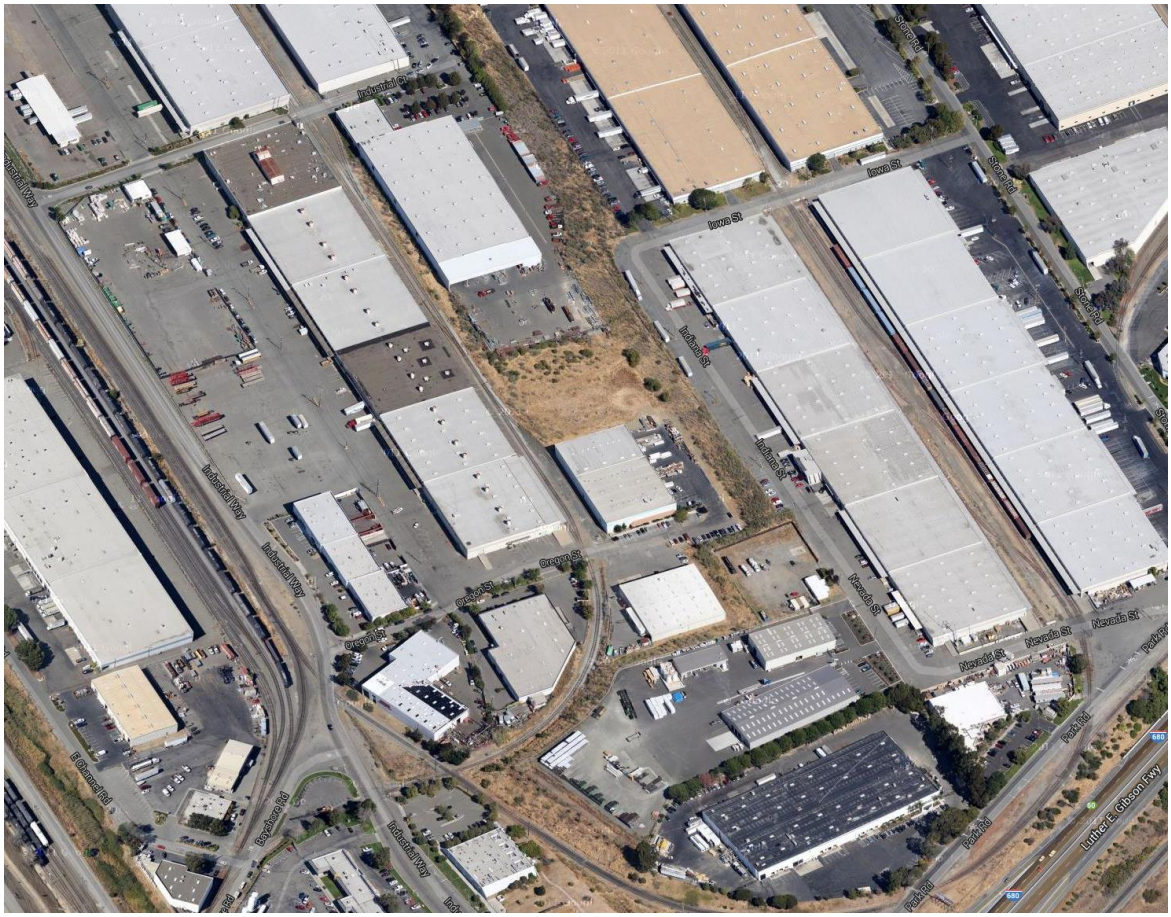


Image: Google 2014

Fairfield: Anheuser Busch

Anheuser Busch is a major shipper and receiver of goods by rail. Inbound traffic includes grains for brewing in covered hopper cars and packaging (i.e., bottles, cans, or kegs), generally in boxcars. Outbound traffic is primarily boxcar loads of beer. Traffic is handled in manifest trains. Even though they are close to the Union Pacific main line at Suisun City, the California Northern Railroad serves Anheuser Busch daily.

Image: Google 2014

Fairfield: Sheldon United

The Sheldon United terminal is a propane distributor. They receive tank cars of propane, which is then distributed via local delivery trucks throughout the region. These tank cars arrive in carload lots. There is no outbound traffic. Like Anheuser Busch, California Northern serves Sheldon Oil.

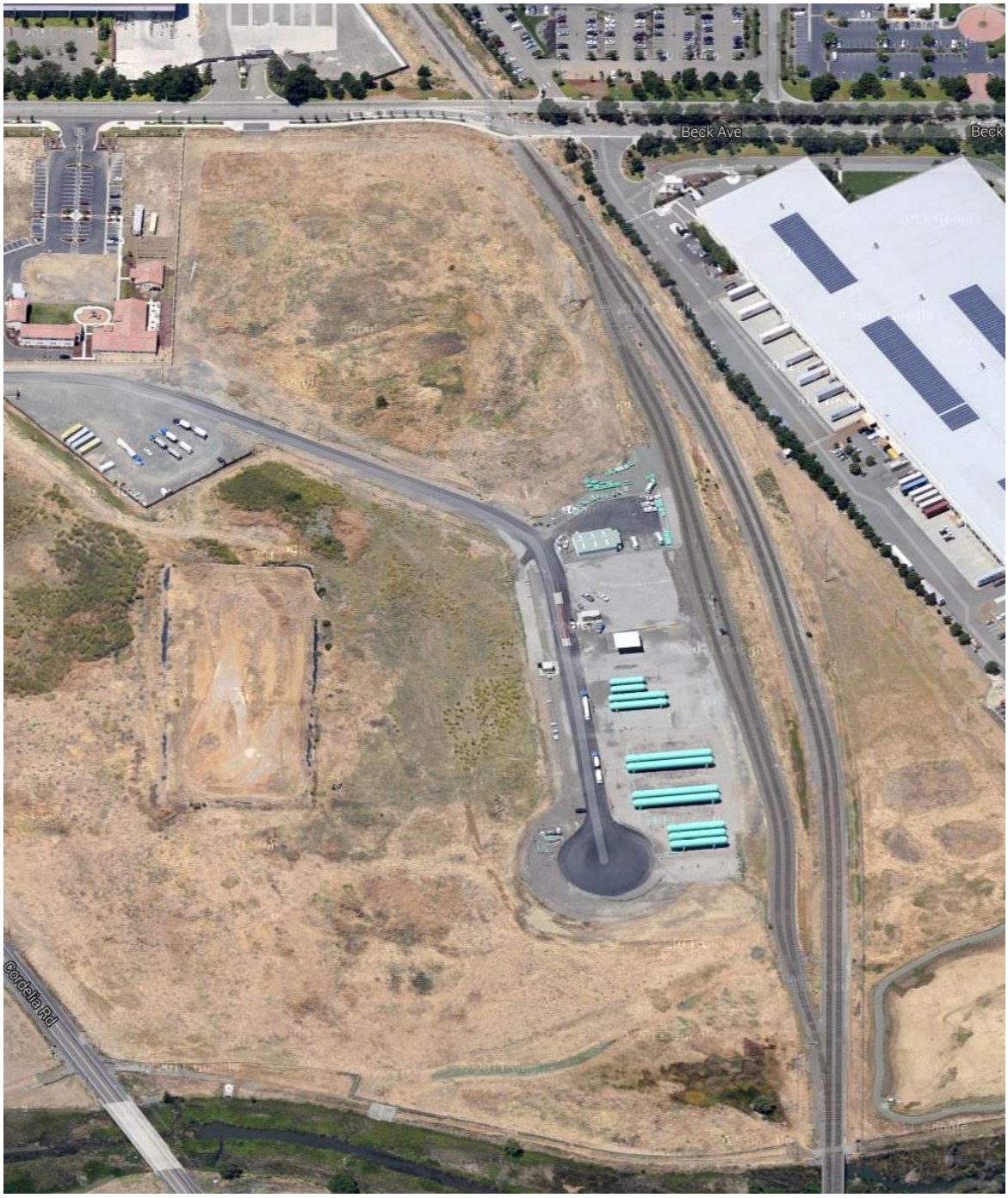


Image: Google 2014

Fairfield: Tolenas Industrial Park

Tolenas Industrial Park is a group of industries on the north side of Fairfield located along a switching track adjacent to the Union Pacific main line. By having a separate switching track, many of the rail switching activities in the industrial park present less interruption to main line operation (and the switching operations themselves are interrupted less frequently by main line traffic). All rail traffic at the Tolenas Industrial Park is carload rather than unit train.

Rail-served industries at Tolenas include:

- Clorox, which receives inbound cars of raw materials
- Ball Corporation, which receives inbound raw materials
- Macro Plastics, which receives plastic pellets in covered hopper cars
- Ashland Distribution Company, which receives raw materials in tank cars and distributes specialty chemicals
- Frank-Lin Distillers
- Goodyear Tire, which receives raw materials in covered hopper cars
- Compu-Tech Lumber, which has received lumber products via flatcar

Image: Google 2014

Dixon: Campbell's Soup / Dixon Canning

Campbell's Soup has shipped carloads of tomato paste by rail sporadically in the last few years, though it is believed they have not shipped via rail recently. Campbell's Soup is located directly on the main line, meaning that any switching at this location has to compete with main line traffic.

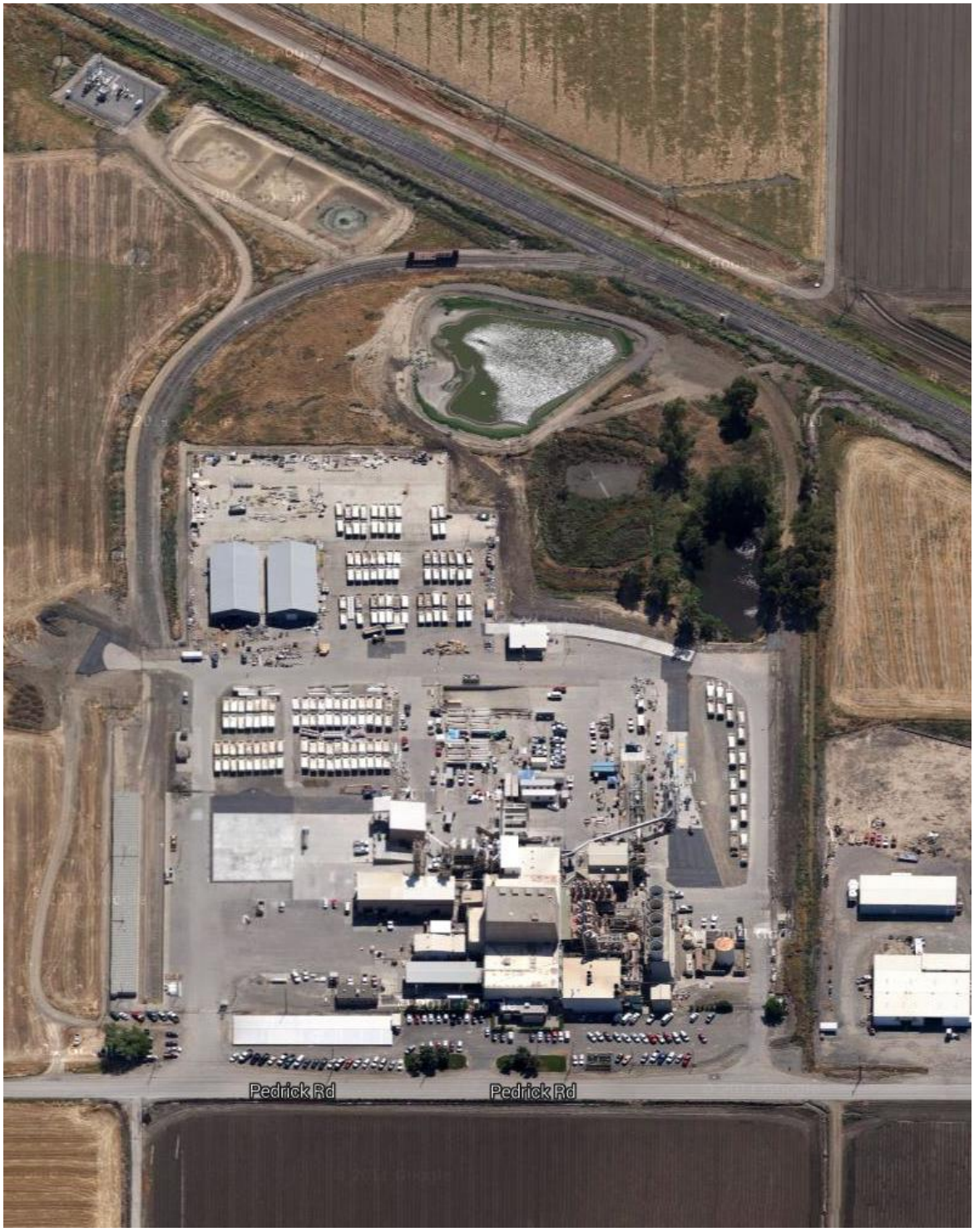


Image: Google 2014

Dixon: Tremont Seed

Tremont Seed receives carloads of inbound raw materials which are used to manufacture fertilizer products for the agricultural industry. Like Campbell's Soup, Tremont Seed is located directly on the main line, meaning that any switching at this location has to compete with main line traffic.

Image: Google 2014

1.5 CURRENT FREIGHT RAIL ACTIVITY IN SOLANO

A summary of the current levels of scheduled freight service can be found in Map C.

Since scheduled and unscheduled moves vary on a week-to-week basis and some commodities (e.g. propane) have some seasonality, these are currently expressed in a range. Local network moves by shortline operators are current estimates.

1.5.1 Class I

Union Pacific Railroad

Union Pacific is the main freight carrier in Solano County. They operate *approximately* 15-25 trains per day on their double-track main line extending from the Contra Costa County line, in the middle of the Carquinez Straight near Benicia, to the Yolo County line near Davis. Most freight trains are through trains, operating to (or from) the Port of Oakland as unit trains of containers.

While the majority of freight to and from Oakland is containerized, there are several manifest trains carrying all types of traffic to or from the Oakland area, as well. There are manifest trains stopping in Solano County to interchange (the railroad term for exchanging cars with connecting railroads) cars with the California Northern and to pick up or drop off cars at Benicia Industrial Park.

Note that the freight activity on the UPRR main line is in addition to the 4 Amtrak long distance trains and 30 Capitol Corridor trains currently operating through Solano County. In addition, on selected dates in the winter an excursion train operates between Oakland and Reno.

1.5.2 Shortlines

California Northern Railroad

California Northern Railroad (CFNR) serves a host of industries west of Fairfield, including connections with other carriers: the Northwestern Pacific Railroad, the former Mare Island Rail Service, and the Napa Valley Railroad. In addition, CFNR serves a host of industries in Fairfield, Lombard, and Napa.

CFNR operates daily switching engines at Fairfield, and offers service three to five days per week to Napa Junction, Lombard, Napa, and to connecting carriers. CFNR interchanges cars almost daily in a manifest train with Union Pacific Railroad; UPRR receives from the originating shippers or forwards them to their destinations.

While not a major shipper, Alstom is the only current customer on Mare Island. Alstom repairs passenger railcars, chiefly the fleet of double-deck cars for the Capitol Corridor and San Joaquin services. Alstom receives cars one at a time for overhaul, with the schedule highly dependent upon the passenger providers' equipment rotations. Service is infrequent, with cars arriving or departing at the rate of a few per month (at most) and connects to California Northern in Vallejo, which in turn connects with Union Pacific, which provides access to the Amtrak maintenance and storage yard in Oakland.

Northwestern Pacific Railroad

Northwestern Pacific Railroad (NWP) handles grain and lumber traffic as far north as Windsor in Sonoma County. NWP also currently handles some construction materials for the Sonoma-Marin Area Rail Transit (SMART) project. They rely on the California Northern to handle traffic between

Lombard (near Napa Junction) and the Union Pacific at Suisun. Current traffic is a few manifest trains per month.

Napa Valley Railroad

The Napa Valley Railroad handles very little freight traffic. The vast majority of their traffic is oriented towards the tourist market in the Napa Valley. While passenger service is operated on a daily basis, only a few, if any, freight cars are handled each year. Any freight traffic to or from the Napa Valley Railroad would pass through Solano County on the Union Pacific and California Northern railroads.

Figure 2 summarizes the estimated current level of regular freight service to the RSBs.

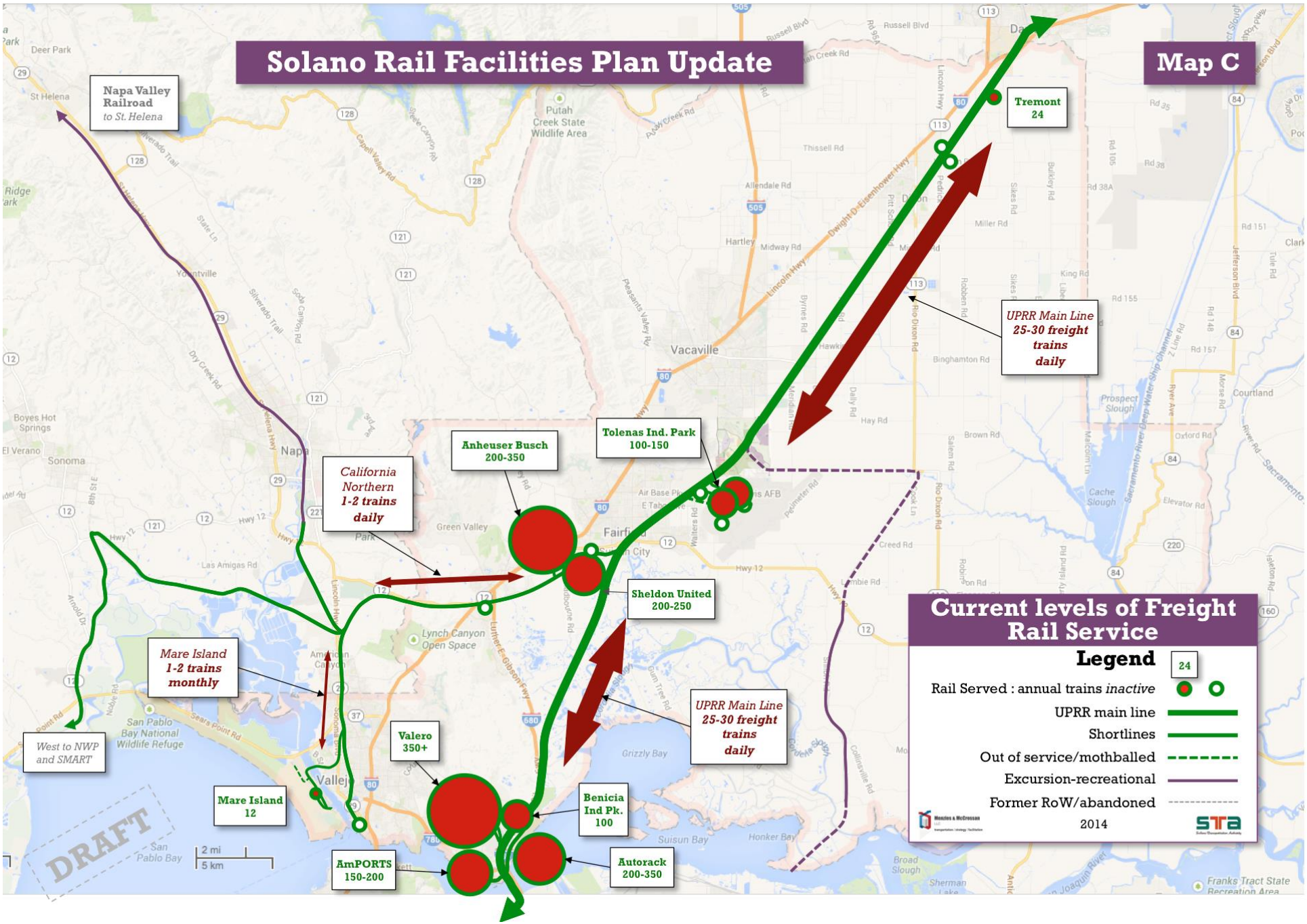
Figure 2 Estimated Current Level Of Regular Freight Service to RSBs

RSB Name	Active/ *inactive / future*	RSB Rail Facility Jurisdiction	Inbound / Outbound Primary	Primary Rail Traffic / Commodity	Typical Annual Rail Delivery Frequency
Tremont Supply Co (Dixon)	✓ active	Solano Co/ Dixon	outbound	ag product	**24**
Tolenas Bus Park Clorox	✓ active	Fairfield	outbound	bulk liquid chemical	**150**
Tolenas Bus Park Ball Metal Beverage	✓ active	Fairfield	outbound	bev container	**100**
Tolenas Bus Park Macro Plastics	✓ active	Fairfield	outbound	plastic raw materials	**100**
Tolenas Bus Park Goodyear	✓ active	Fairfield	outbound	rubber product materials	**100**
Tolenas Bus Park Nexeo Solutions	✓ active	Fairfield	outbound	bulk liquid chemical	**100**
Tolenas Bus Park Sunpol Resins	✓ active	Fairfield	outbound	bulk liquid chemical	**100**
Tolenas Bus Park Compu-Tech Lumber	✓ active	Fairfield	inbound	dim lumber	**50**
Tolenas Bus Park Frank-Lin Distillers	✓ active	Fairfield	inbound	beverage product	**100**
Anheuser Busch	✓ active	Fairfield	inbound	beverage production supply	**300**
Sheldon United Terminal	✓ active	Fairfield	inbound	propane	**240**
Valero Benicia	✓ active	Benicia	inbound	refined petroleum products	**400**
Benicia Ind Park Terminal Biagi Bros	✓ active	Benicia	inbound	beverage product	**100**
Benicia Ind Park Coca-Cola Enterprises Inc.	✓ active	Benicia	inbound	beverage product	**100**
AmPORTS Auto rack	✓ active	Benicia	inbound	finished autos	**300**
AmPORTS Benicia Port Terminal	✓ active	Benicia	inbound	petroleum feedstocks	**200**
Vallejo Mare Island Terminal	✓ active	Vallejo	inbound	railcars	**12**

Notes:

1) These have been aggregated up from daily/weekly/several times per week service to produce annual totals.

2) For commercial confidentiality and practical reasons, the final Solano Rail Facilities Plan Update does not include specific carload counts or operational patterns to specific customers. Both are considered proprietary information, can change at short notice and are subject to the vagaries of the shipper's respective industries.


Solano Rail Facilities Plan Update
Map C
Napa Valley Railroad to St. Helena
Tremont 24
UPRR Main Line 25-30 freight trains daily
Tolenas Ind. Park 100-150
Anheuser Busch 200-350
California Northern 1-2 trains daily
Sheldon United 200-250
Mare Island 1-2 trains monthly
West to NWP and SMART
Valero 350+
UPRR Main Line 25-30 freight trains daily
Mare Island 12
Benicia Ind Pk. 100
AmPORTS 150-200
Autorack 200-350
DRAFT
Current levels of Freight Rail Service
Legend
Rail Served : annual trains inactive
UPRR main line
Shortlines
Out of service/mothballed
Excursion-recreational
Former RoW/abandoned
2014

1.6 FUTURE DEMAND FOR RAIL SERVICE

1.6.1 Key Rail Commodities in Solano and Trends

There are five primary groups of rail commodities in Solano County. For the purposes of planning the need for rail facilities, these can be grouped into two categories, each of which has different trajectories for growth in the 10-year period of the plan:

A) Solano rail commodities that closely track growth in the overall domestic economy:

- Beverage container manufacturing (primarily plastics)
- Liquid bulk chemicals (non-crude)
- Beverage production supplies
- Construction supplies

B) Solano rail commodities that will track the shift in domestic oil refining sources:

- Crude Oil by Rail (CBR)

Solano rail commodities that closely track growth in the overall domestic economy:

The first group has industry forecasts that show growth in the 2 - 4% annual range over the plan period*. Of course, actual requirements for supply of product to RSBs in Solano County are highly individual to each location, but these will serve as a guideline for the order of magnitude range of growth anticipated.

Even within the upper end of the range for all of these products (or even beyond if volumes work to double over the decade), the level of demand for these commodities is likely to remain within the scale current level of service provided through current facilities – i.e. carload rather than new trainload-level demand.

This is because current RSB sites in Solano, based on a review from 2014 data, appear to be operating between 30%and 60% of current capacity, some considerably lower.

Crude Oil by Rail (CBR)

There has been a widely publicized growth in demand for crude oil by rail (CBR), reflecting a replacement by domestic supply of all formerly imported crude oil.

The rates of growth in CBR vary widely across the country based on the source of domestic crude, refining needs and frequent fluctuations in prices – all of these factors will have a bearing on the level of demand for CBR locally.

Commodity growth trends are less relevant to the Solano picture for this commodity than the stated intent by the sole destination for CBR, the Valero refinery in Benicia. Valero has indicated that rail deliveries of Canadian crude would offset the more costly crude that currently arrives at these refineries via marine vessel from Alaska and overseas sources. As of the preparation date of the Plan Update[2], the proposed CBR is understood to be originating in Canada but may also originate from sources in the Midwest.

[2] Data in the Plan Update as of March 2015

Valero is planning an expansion to receive crude feedstock by rail. Currently, an Environmental Impact Report is being prepared pursuant to the California Environmental Quality Act (CEQA). The City of Benicia has not yet taken action on Valero's request to modify their facility to accept the additional train traffic[3]. Based on information in the EIR project description, it appears that Valero is considering accepting as much as 70,000 barrels a day by rail (approximately 50-100 additional cars) which can be accommodated on two 50-car trains (sized to the terminal facilities or less likely, one 100 car train per day of crude oil.

The rail routing into the plant has yet to be determined: if coming north across the Benicia Railroad Bridge, the daily train would make less than one mile of its trip within the County. If coming west from the Davis direction via Roseville, the train would make a 40-mile transit through the County to the refinery, through Dixon, Vacaville, Fairfield, Suisun and Benicia.

CBR has been the subject of much discussion in relation to safety. The regulation of these trains is jurisdictionally outside the authority of Solano County or Solano Transportation Authority. The consultants noted during the course of the Plan Update, several potential measures to address concerns about the safety of these shipments.

At the California level, an Assembly Bill 380 sponsored by Assemblyman Roger Dickinson and approved by the Governor late 2014, addressed the current arrangement whereby railroads were not required to share future oil train schedules with first responders ahead of time (although they did meet requests for information from wayside jurisdictions). AB 380 requires that railroads shipping crude oil provide state and local emergency officials with information about oil and hazardous materials that may be shipped through their jurisdictions. It also requires carriers, when shipping Bakken crude oil, to provide the state with information about the volume of oil and timing of the shipment ahead of time and also provide the state with copies of the carrier's hazmat emergency response plan.

At a Federal level, US Department of Transportation in late 2014 issued a Notice of Potential Rulemaking (NPRM) on the subject, which among other requirements for CBR trains (defined as 20 or more cars) would:

- Propose new standards for tank cars constructed after October 1, 2015, retrofitting of the existing industry standard DOT111 cars and retiring those which are not enhanced
- Impose a 40-mph speed restriction on CBR trains in most areas
- Evaluate a 30-mph speed restriction for CBR cars/trains that do not comply with new enhanced braking requirements
- Require trains containing one million gallons of Bakken crude oil to notify State Emergency Response Commissions (SERCs) or other appropriate state delegated entities about the operation of these trains through their States
- Require carriers to perform a routing analysis for CBR that would consider 27 safety and security factors and select a route based on findings

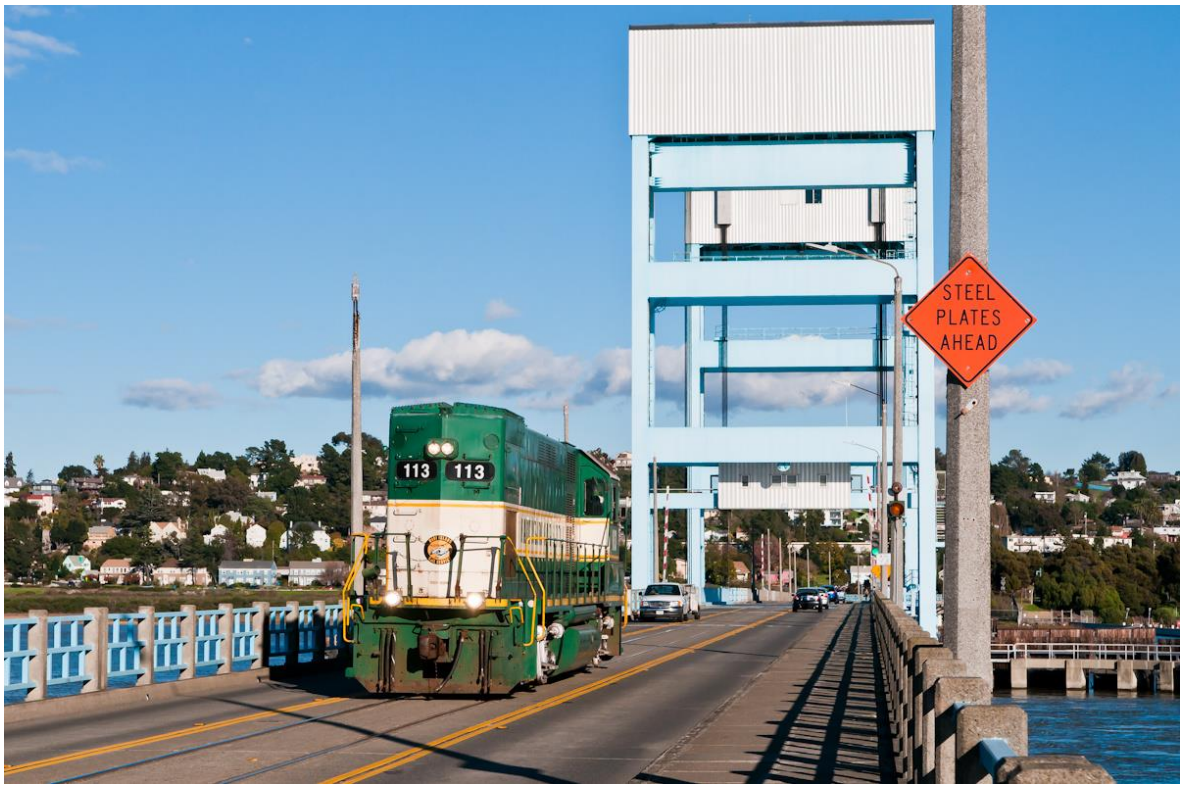
[3] As of the plan preparation (March 2015), the City of Benicia has indicated that a Recirculated Draft EIR for public comment is anticipated June 30, 2015

1.6.2 Former Rail Served Businesses (RSBs)

The major former rail-served businesses in Solano County include:

Mare Island

The Navy's presence at Mare Island was the main generator of the types of freight traffic that would employ rail service – heavy, bulk items traveling long distances. For the Navy, this traffic was comprised of raw and fabricated steel products. The potential for a large rail shipper on the Island is dependent upon a large manufacturing facility locating there. The remaining traffic would be occasional scrap metal from ship breaking operations. There have been discussions of establishing an industrial park or bulk handling facility on the north side of the island.


STEEL
PLATES
AHEAD
113
113


Railroad Ave
Railroad Ave
Nimitz Ave
Nimitz Ave
Nimitz Ave
Nimitz Ave
Waterfront Ave
Waterfront Ave
Waterfront Ave
Waterfront Ave
Waterfront Ave
Waterfront Ave
Mare Island Causeway
Mare Island Causeway

Travis Air Force Base

Travis Air Force Base is a major facility for the USAF Air Mobility Command and had a rail connection for bulk items on the western side of the base, crossing at Walters Rd., but the connection with Union Pacific was severed at least 7 years ago. Travis currently serves as a base for cargo and military passenger aircraft, and has the largest throughput of both in the United States.

Equipment that could be handled by rail for air deployment is typically staged at an Army base located near an air base (rather than loaded on trains for transport to an air base and subsequent loading on planes). Although bulk liquid (aviation fuel, for example) is often well suited to rail in its volume, weight and length of rail haul characteristics, the type of military equipment handled by rail (tanks, munitions) is not typically conducive to air transport unless a rapid deployment situation is necessary.

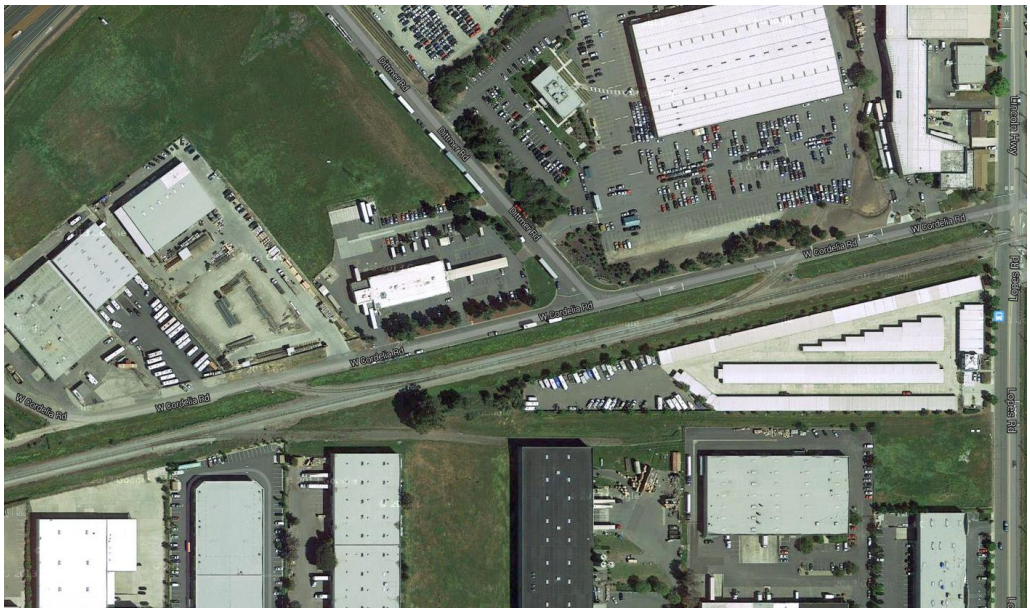
Several decades ago, additional rail service to the base was made via the former Sacramento Northern route (now owned by the Western Railway Museum, as described in this report), crossing the North Gate road, with a live connection to the UPRR main line. The consultant is in ongoing discussions with Travis AFB staff to confirm the potential for future cargo by rail potential and for reactivating the former rail connection.

Cordelia former RSBs

There are four former RSB locations in south Cordelia, all of which have private sidings intact on both sides of W. Cordelia Rd., but which have changed activity/ownership since they were served by rail:

- North Bay Auto Auction
- White Cap Construction Supply
- Glass Pak (former)
- Dependable Plastics

It has been some years since these were rail-served, and not considered likely, given their current activity profiles, to be returning to rail in the near future.



General Mills (Vallejo Marine Terminal)

The General Mills flour mill at Vallejo was a major receiver of grain products. It has since closed and some of the facilities and equipment have been demolished or auctioned off. Vallejo Marine Terminal, LLC, purchased most of the property and leases a portion of the property from the City.

The new property owners have proposed to rebuild the bulkhead and improve the site, and have leased a portion of the site to Orcem California, LLC, a building materials manufacturer. Orcem would use the terminal facility to receive raw cement admixture material by ship, process it, and ship it out by truck and rail to cement makers. Depending upon demand of the product, this could generate substantial rail traffic.

The proposal currently in the environmental review process envisages up to 50 car trains four times per week or 10,400 carloads annually. This operation, a substantial boost to the viability of this segment of the local rail network, is still within the overall level of traffic which the line has accommodated in past decades.

Napa Pipe

While not technically in Solano County, the Napa Pipe plant was a major rail shipper. Some inbound steel arrived by rail, and significant outbound pipe departed – often in unit trains as frequently as weekly. Several of the main structures at Napa Pipe have been demolished, and there

is little opportunity for this facility to manufacture steel pipe, though it could conceivably be re-purposed for freight rail, if demand warranted maintaining the connection.

1.6.3 Potential New Rail Served Business (RSB) Sites

Factors in identifying future RSB sites:

Although much of Solano County has suitable frontage to the UPRR mainline, in practice there are three major considerations which factor into identifying future RSBs:

Land Use/Zoning Designation

Given the rural nature of large parts of the County, there are many other potential sites that could be suitable for rail served businesses. Flat sites with extensive frontage along railroad tracks and access to roadways and utilities are the main candidates. However, land use regulations and development policies (most notably the Solano Orderly Growth Initiative, which prohibits urban-scale development in the unincorporated County) are a major factor in determining whether these sites are ultimately suitable for rail served businesses. With this in mind, sites that are currently or likely to be designated for rail-served industrial use have been included in this assessment.

Rail Traffic Thresholds Service Providers

Another major factor in determining whether a site is suitable for a rail served business is the quantity of traffic it would generate for the serving railroad. Generally, businesses located along a busy mainline (such as UPRR's main line) would need to generate dozens or hundreds of carloads – the equivalent of several unit trains – each month in order for the economics of establishing a new rail connection to be viable (the economics are often related to the engineering parameters of the connection to the main line).

Conversely, shortlines (such as California Northern) are able to cost-effectively serve much smaller enterprises, though the minimum shipping volume is often still on the order of a few cars per week or per month in order to justify a new service. Several of the current RSBs served by CFNR are currently at the lower end of this threshold.

Typical Rail-suited Commodities

Examples of typical industries that can be effectively served by rail (if located in close enough proximity to a rail line) and could be candidates for Solano County include grain storage and distribution facilities, fertilizer distribution facilities, cement distribution facilities, petroleum or ethanol products facilities, plastics manufacturing facilities, and manufacturing facilities that require high volumes of inbound raw materials.

There are, therefore four potential future locations for large scale freight rail service that have been included in the plan assessments to date, shown on Map D:

1) Vallejo Marine Terminal

As mentioned, the proposed Vallejo Marine Terminal facility, with alternative cement material manufacturer Orcem California as one of the main tenants, could be the most well advanced significant new rail served business in Solano County, potentially generating over 10,000 annual railcars outbound (inbound materials would arrive by ship, train and truck). The project has not received discretionary approval from the City of Vallejo as of the date of this report.

2) Fairfield General Plan Areas 6A and 6B

Some 300 acres of potential rail-served industrial use have been designated in the updated Fairfield General Plan and Fairfield-Vacaville Station Specific Plan, identified as Plan Areas 6A and 6B. Both are likely suitable for the small number of larger rail users – either manufacturing are rail-linked distribution facilities.

3) Cordelia Road, Fairfield (adjacent to Anheuser Busch)

The 43-acre “Buzz Oates Development” site at the Cordelia Road/Hale Ranch Road intersection adjacent to the southern boundary of the Busch plant and the California Northern line has been identified, with the potential for direct access from the Busch spur.

4) Dixon-Unincorporated County

There may be additional sites that could be suitable for rail served businesses, assuming land use patterns are supportive of industrial uses. Solano Economic Development Corporation (EDC) has considered the potential for a 700-acre area (currently used for agriculture) northeast of Dixon in the I-80-Vaughan Road/Tremont Rd/railroad triangle being zoned to support agricultural-related industries in the 2008 Solano General Plan (see Appendix 2). In order for this site to be conducive to rail-served businesses, track connections and configurations would need to be identified, based on likely interest from manufacturing or distribution operators.

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Solano Rail Facilities Plan Update
Map D
Napa Valley Railroad
to St. Helena
700 acre development area
Dixon / County
Planning Area 6A
Fairfield / County
Planning Area 6B
Fairfield / County
Cordelia Rd
Fairfield
VMT
Vallejo
West to NWP and SMART
Possible Locations for Large Scale Freight Rail
Legend
Rail Served Business active inactive
UPRR main line
Shortlines
Out of service/mothballed
Excursion-recreational
New large freight rail RSB site
2014

1.7 FREIGHT CAPACITY BOTTLENECKS AND NEEDS

1.7.1 Current Bottlenecks

Freight bottlenecks often occur at locations where trains slow down due to curves or grades. There are none of these in Solano County. The steepest grade is in American Canyon, on the California Northern line. However, since that railroad typically only handles short trains and speed is not a key factor, it does not represent a major bottleneck. The descent from the Suisun Bay Bridge is short and is normally only used for "downhill" trains, with "uphill" trains employing the other track which has a much gentler grade (and which has much less effect on train movement).

However, the low-grade track does feature several curves and a trestle that limits speeds for the fastest trains (including passenger trains).

Suisun Bay Bridge

The bridge itself can be an operational bottleneck when ship traffic requires that the moveable span be lifted. Since ship traffic has the right-of-way, trains must wait until vessel traffic has passed. (At this location, a sophisticated signal system prevents trains from approaching the bridge when it is in its open position.) Typically the duration of the open lift span is 10-15 minutes for a ship passing which, given the volumes of freight and passenger traffic, can have an impact on the fluidity and reliability of rail movements across both sides of the bridge.

Tolenas Industrial Park

The industrial park's switching activity is another bottleneck. Due to the current track configuration, some of that switching may affect main line operations. However, it is the consultant's understanding that the proposed improvements associated with the new Fairfield-Vacaville train station will alleviate many, if not all, of the remaining issues by lengthening the switching tracks. This will provide space for entire trains switching in the Industrial Park to exit the main line.

Suisun Junction

To the extent that some switching may occur on the main line, the junction at Suisun with the California Northern can also be a bottleneck. This could be alleviated by providing more storage space for trains to exit the main line, or possibly by providing more space for switching along the California Northern route.

This ability of trains to completely exit the main line while switching is a benefit for rail served businesses, present and future, located along the Union Pacific. When the engineering conditions are such that a train can completely exit the main line, through freight and passenger trains can pass uninterrupted.

Davis Station Curve

Although just outside Solano County, the curve at Davis train station is also a bottleneck for freight trains, since they slow down while traversing the curve. However, eliminating the bottleneck would likely require re-routing freight traffic around Davis on a new alignment (possibly extending into Solano County), and would likely be uneconomical.

1.7.2 Future Bottlenecks (10-year outlook)

Suisun Marsh

Because Union Pacific's route through Solano County is relatively flat and has few curves, there may be areas which are candidates for higher passenger train speeds. Since the Suisun Marsh is a long section with no stations and a single, broad curve, there may be a time in the future when this becomes a candidate section for faster passenger train speeds. To allow passenger trains to overtake slower passenger or freight trains, an additional track may be necessary. Although in many areas of the County this would present few significant challenges, the environmental sensitivity of the Suisun Marsh could pose permitting problems that may ultimately constrain capacity.

Suisun Bay Bridge

The Suisun Bay Bridge (as discussed previously) will also continue to be a bottleneck into the future. Resolving the boat traffic issue may necessitate a higher bridge, which would come at great expense.

Vallejo Marine Terminal

The proposed bulk import facility at Vallejo Marine Terminal may also be subject to bottlenecks, since the route to the Terminal passes through a residential area with many grade crossings. Unit trains operating slowly through this area could cause intermittent roadway traffic congestion as they pass or are switched. However, this would likely not be a major issue for roadway traffic unless rail freight traffic was frequent. These unit trains could also encounter slow operation through American Canyon due to the steep grade; however, since there is no rail congestion in this area, a single slow freight train would not affect grade crossings or other rail traffic.

Mare Island Causeway

Another potential bottleneck is the Mare Island Causeway lift bridge crossing the Mare Island Strait. The loading capacity of this structure is not known, and it could present challenges if frequent, heavy loads were operated. The trackage shared with roadway traffic on the bridge as well as on the streets of Mare Island could also create conflicts between trains and motorists. This would likely not be a problem if train operations are infrequent, but if more frequent operations or longer trains were considered this could pose a challenge. Future development of housing and commercial/industrial uses on Mare Island could also increase auto traffic using the bridge, further exacerbating congestion.

These bottlenecks are assessed further in the infrastructure and safety section (chapter 4) of the Plan Update.

Map E provides an overview of these current and potential freight rail network bottlenecks in the County, based on a 10-year outlook.

1.8 INITIAL CONCLUSIONS: KEY FREIGHT RAIL CAPACITY ENHANCEMENT NEEDS

Our Initial conclusions are organized within the three major levels of the Solano County freight rail network. They are focused on the freight rail capacity enhancement needs which have emerged from the foregoing analysis and the team's industry experience, both locally in these rail corridors and nationally. These may be modified or augmented when the overlay of passenger service needs is conducted in subsequent tasks of the Plan Update. These should be regarded as preliminary conclusions.

1.8.1 The Current Mainline Network

Infrastructure was built for service levels considerably above current demand – in the pre-2009 Great Recession era, this section of the mainline was carrying as many as 40 freight trains a day. Presently the range current level of freight service is typically 15-25 freight trains per day through Solano. Regularly scheduled passenger services currently *exceed* the number of scheduled freight moves through Solano County, meaning that, at least during daytime, passenger services actually predominate on the mainline.

Looking ahead 10 years in Solano, there are many unknowns, which include:

- The growth trends and choices by the Class I Railroads of routing of port-generated /Northern California intermodal traffic
- Frequently changing origin locations and mode choices for major growth commodities (especially petrochemicals/CBR)
- Any future renegotiations to add passenger slots on the mainline above the current CCJPA agreement

Many of these passenger-freight mainline 10-year capacity considerations are items to be considered in subsequent tasks, but for the purposes of this Task 3 assessment, the following appears possible:

- Freight train numbers may have not recovered to pre-recession levels, and it is unclear when or even if they will within the 10-year horizon.
- Depending on shippers' schedule needs, there are potentially slots available for *all* of the anticipated major growth on mainline-served freight demand in Solano i.e.
    - A daily full CBR train serving Valero
    - Several Busch-scale production facilities in the three potential Fairfield sites (unlikely even to total a daily trainload)
    - Several large production facilities to be designated in the unincorporated County east of Dixon

A single medium-sized plant generating a dozen cars a week would unlikely sustain the costs of a new mainline connection. A plant or group of facilities receiving a dozen cars per day (or perhaps a train every few days) may sustain the costs of such a connection.

However, the establishment of major customers served directly from the mainline at any of these three designated areas might be handled with existing infrastructure *if* the switching operations were configured properly, with extended sidings to remove all local rail traffic from the mainline, as is being developed for Tolenas as part of the Fairfield-Vacaville station project.

1.8.2 Shortline Facilities

California Northern currently interchanges around 24,000 cars annually with UPRR: this is less than half of the level of the mid-1990s to 2000's and reflects that:

The shortline business base in Northern California has been contracting (even before the Great Recession) and the business market for carload rail is a challenging one: with a few exceptions, shippers' traffic needs have decreased, not increased

- Even with a 10-year look ahead, based on known development sites (North Mare Island and the Orcem Vallejo Marine Terminal (VMT) project, which is forecasting 50,000 annual carloads), the results yield traffic levels below where they were when the Navy was operating at Mare Island and General Mills had regular service to Vallejo. The VMT project could, however, reactivate and secure the future of freight rail infrastructure that could otherwise be vulnerable to closure.
- Several customers have been lost to rail, e.g. all of the Cordelia area customers together with Napa Pipe and former sugar beet growers in northeast Solano County. They have mostly changed ownership, or through lack of overall competitiveness in their respective industries, the rail-linked sites have abandoned manufacturing/distribution and are unlikely to return to rail.

1.8.3 RSB Facilities

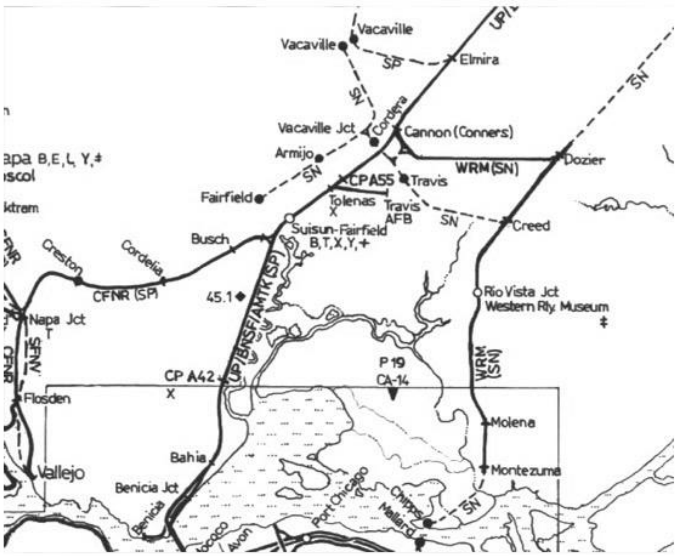
Our review of current capacity of the RSB-level and utilization based on multiple 2014 local observation/site visits shows the current utilization of private sidings is generally in the 30- 60% range). The former RSBs identified in this document that become rail shippers again are unlikely to generate a need for major rail infrastructure facilities investment beyond their own sites, since shortline and mainline capacity appears adequate to absorb all of their former traffic.

Figure 3 Estimated RSB Facility Utilization 2014

RSB Name	Active/ *inactive / future*	RSB Rail Facility Jurisdiction	Primary Rail Traffic / Commodity	Typical Annual Rail Delivery Frequency 2015	Est. RSB Facility utilization 2015
Tremont Supply Co (Dixon)	✓ active	Solano Co	ag product	**24**	**50%**
Potential Development Area East	***future***	*Solano Co/ Dixon*	*TBD*	-	*0%*
Campbell Soup Supply Co	*inactive*	*Dixon/Solano Co*	*food/bev product*	-	*0%*
Sucro-Dixon	*inactive*	*Dixon/Solano Co*	*ag product*	-	*0%*
Tolenas Bus Park Clorox	✓ active	Fairfield	bulk liquid chemical	**150**	**60%**
Tolenas Bus Park Ball Metal Beverage	✓ active	Fairfield	bev container	**100**	**40%**
Tolenas Bus Park Macro Plastics	✓ active	Fairfield	plastic raw materials	**100**	**40%**
Tolenas Bus Park Goodyear	✓ active	Fairfield	rubber product materials	**100**	**50%**
Tolenas Bus Park Nexeo Solutions	✓ active	Fairfield	bulk liquid chemical	**100**	**40%**
Tolenas Bus Park Sunpol Resins	✓ active	Fairfield	bulk liquid chemical	**100**	**60%**
Tolenas Bus Park Compu-Tech Lumber	✓ active	Fairfield	dim lumber	**50**	**20%**
Tolenas Bus Park Frank-Lin Distillers	✓ active	Fairfield	beverage product	**100**	**60%**
Travis AFB	*inactive*	*Fairfield*	*avgas/DOD*	-	*0%*
Anheuser Busch	✓ active	Fairfield	beverage production supply	**300**	**60%**
Sheldon United Terminal	✓ active	Fairfield	propane	**240**	**70%**
Amcor Rigid Plastics	✓ active	Fairfield	plastic raw materials	**100**	0%
Tolenas Bus Park Rexam	*inactive*	*Fairfield*	*bev container*	-	*0%*
Jensen Precast Building Systems (fmr Fibrebond)	*inactive*	*Fairfield*	*n.a.*	-	*0%*
West Cordelia (North bay Auto Auction)	*inactive*	*Fairfield*	*n.a.*	-	*0%*
West Cordelia (White Cap Construction Supply)	*inactive*	*Fairfield*	*n.a.*	-	*0%*
West Cordelia (fmr. Glass Pak)	*inactive*	*Fairfield*	*n.a.*	-	*0%*
West Cordelia (Dependable Plastics)	*inactive*	*Fairfield*	*n.a.*	-	*0%*
Future Plan Area 6 A	***future***	*Fairfield*	*TBD*	-	*0%*
Future Plan Area 6 B	***future***	*Fairfield*	*TBD*	-	*0%*
Valero Benicia*	✓ active	Benicia	refined petroleum products	**400**	**70%**
Benicia Ind Park Terminal Biagi Bros	✓ active	Benicia	beverage product	**100**	**50%**
Benicia Ind Park Coca-Cola Enterprises Inc.	✓ active	Benicia	beverage product	**100**	**30%**
AmPORTS Auto rack	✓ active	Benicia	finished autos	**300**	**80%**
AmPORTS Benicia Port Terminal	✓ active	Benicia	petroleum feedstocks	**200**	**70%**
Vallejo Mare Island Terminal	✓ active	Vallejo	railcars	**12**	**10%**
Vallejo Marine Terminal	*inactive/ future*	*Vallejo*	*grain (future cement product)*	-	*0%*


Solano Rail Facilities Plan Update
Map E
Napa Valley Railroad
to St. Helena
Tremont
Davis Curve
Outside County
Tolenas Ind Park
Main line switching rail congestion (station project will alleviate)
Suisun Junction
Main line switching rail congestion
Tolenas Ind. Park
Clorox, Ashland (6)
Anheuser Busch
Sheldon United
Mare Island Causeway
Shared roadway-trackage
Suisun Marsh
long term speed improvements environmentally constrained
West to NWP and SMART
Mare Island car repair
Benicia Ind Pk.
Valero
Autorack
AmPORTS
Vallejo
VMT project: grade crossing congestion
Suisun Bridge
lift span delays
Current and Potential Freight Rail Bottlenecks
Legend
Rail Served Business active inactive
UPRR main line
Shortlines
Out of service/mothballed
Excursion-recreational
Bottleneck today / Future
Vacaville
Napa
Sonoma
2 mi
5 km

Solano Rail Facilities Plan Update



Chapter 2

CAPITOL CORRIDOR:

REVIEW AND UPDATE OF 1995 PLAN

2 CAPITOL CORRIDOR - REVIEW AND UPDATE OF 1995 PLAN

2.1 INTRODUCTION

This technical memorandum summarizes the assumptions and potential for passenger service in Solano County at the 10-year horizon of the Plan Update – i.e. operations in 2024–25.

These assumptions provide the foundation for the following elements of the task and plan outputs:

- Operational analysis of shared passenger/freight rail capacity
- Determining the connecting level of transit service needs
- Assessing parking requirements for Solano passenger stations
- Assessing the adequacy of bike and pedestrian access to stations served by Capitol Corridor trains (in the subsequent Safety task as part of the final plan)

Taken together with the subsequent Sea Level Rise and Safety tasks in Sections 3.2 and 3.3, this chapter provides a foundation for the future list of infrastructure improvements, cost estimates and potential funding and implementation content of the final Plan Update.

2.2 EXISTING CONDITIONS, PLANS, AND POLICIES

Existing conditions, reference station area planning documents and growth assumptions are contained in the Appendix.

2.3 STATION LOCATIONS

2.3.1 Current Solano Passenger Rail Service

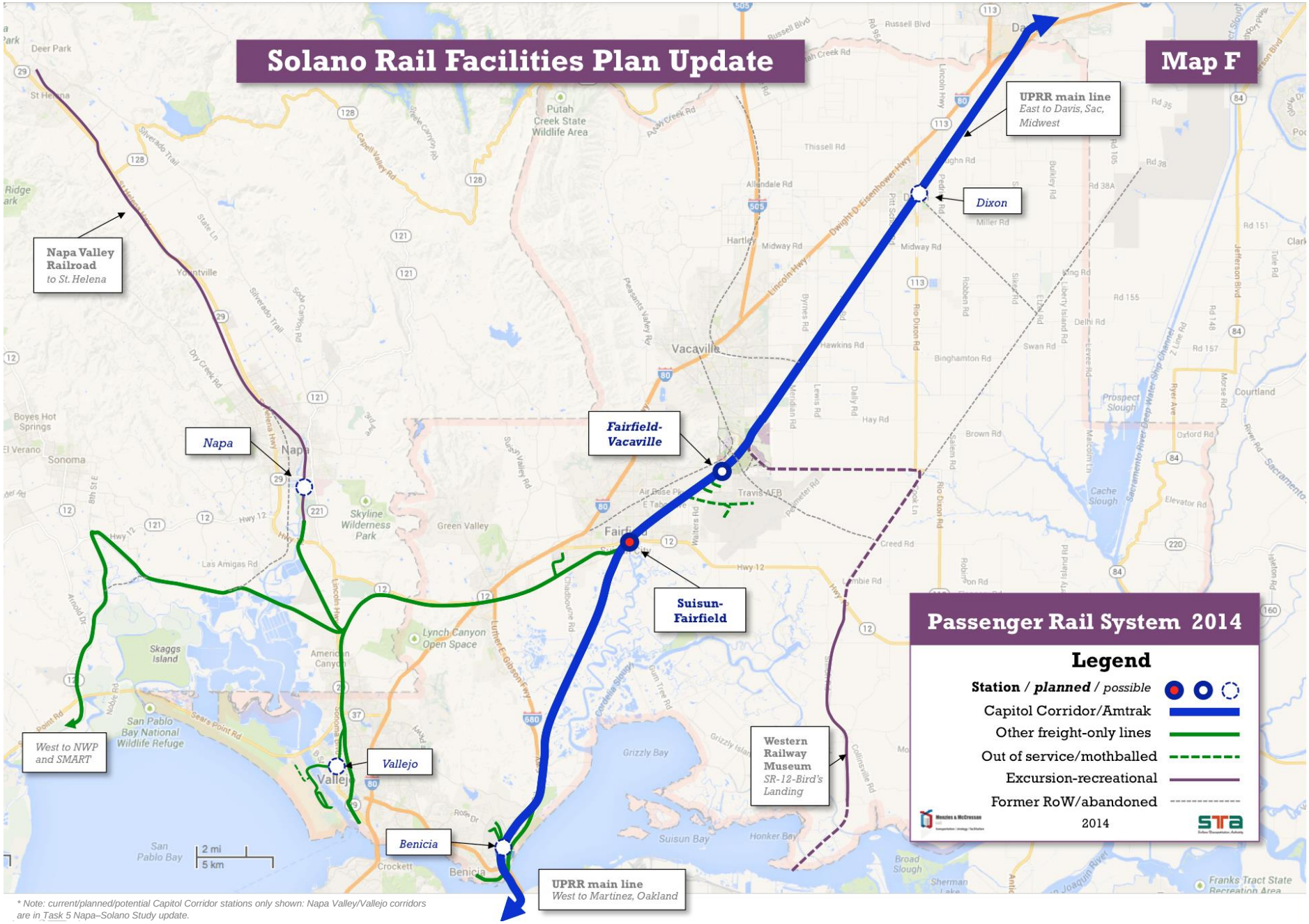
(Map F)

2.3.1.1 Capitol Corridor Service

Currently there is one station with regular passenger service in the county (see Map F), Suisun-Fairfield, with 196,000 users annually in FY13[4]. The station is served by all Capitol Corridor trains both eastbound serving destinations from Davis east to Sacramento (and ultimately Auburn), and westbound to Oakland and other Bay Area destinations, ultimately San Jose (see Map F):

[4] CCJPA/Amtrak data for the year 2013-14

Map F: Passenger Rail System 2014



** Note: current/planned/potential Capitol Corridor stations only shown: Napa Valley/Vallejo corridors are in Task 5 Napa–Solano Study update.*

Figure 4 Current Level of Capitol Corridor Service: Suisun-Fairfield Station

Direction of Travel	Weekdays	*Weekends/ Holidays:*
Level of service:		
Westbound	15 trains	*11 trains*
Eastbound	15 trains	*11 trains*
Span of service:		
Westbound	5:09am-9:49pm	*6:19am-9:49pm*
Eastbound	6:33am-11:13pm	*8:28am-11:23pm*

2.3.1.2 Amtrak Long Distance and other passenger services

In addition to Capitol Corridor trains there are also four daily Amtrak long distance trains (serving the Bay Area to Chicago and Seattle to Southern California routes), which pass through Fairfield-Suisun and do not currently stop in the County. The nearest station stops by the Amtrak long-distance services are in Martinez and Davis. (See Appendix for current schedules).

There is also an additional winter-only service (Sierra Scenic Snow Train on weekends and midweek Reno Fun Train) that runs during ski season between Emeryville and Reno, which makes stops in both directions at Suisun-Fairfield.

The County's sole station stop was established in 1991, when Capitol Corridor service began, and has been served by additional services on every occasion that these have been expanded.

2.3.2 Current Station Facility: Suisun-Fairfield Station

Staffing: The Suisun-Fairfield (SUI) station is currently not staffed by Amtrak/CCJPA, but is staffed by STA commute consultant customer service representatives. Most of the smaller stations on the Capitol Corridor, with the exception of the terminal stations and some larger cities, are unstaffed. The station has *Quicktrak* ticket vending machines available.

The station has a modern depot building, rehabilitated from a 100-year old station structure, and offering passenger waiting and restroom services. A café in the passenger waiting area is staffed during commute hours. The station is the highest used stop on the corridor that is unstaffed. As of early 2015, Suisun City and STA have developed and funded a plan to upgrade the station, with construction work scheduled to commence in the summer of 2015.

Parking: There are approximately 300 spaces in the park and ride lot at Main Street//Lotz Way, with additional on street parking.

Bike and pedestrian access is via Main Street and Railroad Ave. Access to downtown Fairfield is currently via a pedestrian bridge crossing the tracks under SR-12 to Union Ave.

Connecting transit service: The station is served by local Fairfield and Suisun Transit (FAST) and SolanoExpress with two FAST routes connecting all trains (not a timed transfer) with local route destinations in Fairfield and Suisun City: Route 5 operates on 30 minute frequency 6am-7pm and some Route 7 services on school days. SolanoExpress Route 90 connects the station with the Fairfield Transit Center and destinations west to El Cerrito Del Norte BART.

Napa Vine Transit makes seven weekday stops at the station on its Route 21 service to Napa. Both Greyhound (west to Oakland/Vallejo and east to Sacramento/Reno) and Delta Breeze (to Rio Vista/Isleton) make non-timed transfer stops at the station.

2.3.3 Planned Station: Fairfield-Vacaville (FFV) Intermodal Station

In addition to the current station, a second station 5 miles to the east at the Peabody Road crossing of the Union Pacific Railroad main line, is in the final stages of design, with construction scheduled to begin in 2015 and revenue service scheduled to occur 2017.

The station components are as follows:

Rail Side:

- Unstaffed passenger platform 800 ft. long, 43 ft. wide
- Grade separated pedestrian access via pedestrian under crossing
- Passenger waiting building with designated space for food vending or service
- Public address system and real-time train arrival monitors
- *Quicktrak* ticket vending machines

Land Side:

- Parking for approximately 350 vehicles in the near-term (The City plans to construct a multi-story parking structure when parking demand increases).
- Transit access via curbside facilities accommodating up to 6x40' vehicles
- Pickup and drop-off curb space accommodating 10 vehicles
- Passenger bike lockers

2.4 CURRENT CAPITOL CORRIDOR JOINT POWERS AUTHORITY STATION STOP CRITERIA

In order to clarify the criteria guiding the establishment of new stations on the corridor, the governing body for Capitol Corridor services Capitol Corridor Joint Powers Authority (CCJPA) has developed a set of physical design, funding and operating requirements that have to be satisfied in order for a station stop to be considered.

In February 2006, the CCJPA Board adopted a set of principles to guide the development of an updated set of CCJPA policies on stations served by Capitol Corridor trains and the extensions and expansion of

Capitol Corridor train service and train stations. Originally developed in 1998, these were revised in June 2006 by the Board and are shown in Figure 5.

The criteria as they relate to additional stations are grouped around three primary principles – 1) Station Standards, 2) The Station Funding Plan and 3) Support of The Host Railroad – and are summarized in Figure 5.

The current criteria have been developed against the background of several key factors:

a) Operational ownership

Capitol Corridor is effectively a tenant operating services on the host railroad – Union Pacific's – tracks, via a trackage rights agreement. The host railroad therefore shares its freight train capacity with passenger trains: any additional stops or changes to the schedule have to be considered carefully alongside their schedule needs and priorities. There is currently an effective ceiling of 30 trains (15 round trips) per day within the current agreement.

b) The need to balance new passenger needs with schedule and performance impacts

Existing station stops and passengers using them should not be adversely affected by the addition of new stops. Any new station proposal has to quantify the negative effects on schedule, on-time performance and corridor-wide end-to-end running times, and means of mitigating those effects (if this is possible).

Minimum numbers of boardings (10 boardings/alightings per train in the first 6 months or service) generated by new stations are also therefore part of the current criteria (Suisun-Fairfield station significantly exceeds this minimum, serving almost 600 passengers daily).

c) Physical design considerations

Although most stations are served on the corridor solely by Capitol Corridor trains, designs also have to conform to Amtrak's station standards at a minimum.

Since track capacity is limited to the current number of trains within the agreement with Union Pacific, additional capacity for future growth is initially being accommodated by the future addition of longer trains.

Train lengthening has already been happening during the course of the past decade, and in the future the standard train length is anticipated to be 8 cars. The current train length varies but is typically 4-5 cars. Therefore all future stations should be able to accommodate this length of platform (700'), ideally on tangent (straight) track.

At locations where the platform configuration has *through* passenger or freight trains serving a boarding face – either an island platform or side platforms – safe pedestrian access typically requires grade separation – under or over the tracks. Modern ADA access requirements and physical setback distances for pedestrians to safely clear structures on the platform while trains are passing through the station are also resulting in more generous widths for platforms than would have traditionally been the case in the pre-ADA era.

Circumstances vary station by station, but these are the primary physical considerations and they impose a more extensive physical footprint for a planned new station than in the pre-2006 era.

Note that these are criteria established for the approval of potential stations in principle, within current design standards, and not a prescriptive design template for every new station, or a guarantee that a station will be approved. Ultimately, the station project has to meet all the criteria and be approved by Union Pacific Railroad (UPRR), the host railroad.

Other Criteria

In addition there are other CCJPA policies that relate to new stations but are not necessarily part of the in-principle approval requirements. For example, there has been an increased use of bicycles accessing the Capitol Corridor trains which has resulted in demand for on-board and station bike storage exceeding previous design capacity for bikes.

This is a common experience of commuter rail systems throughout the country over the past decade; demand for bike access has been growing faster on the Capitol Corridor then on the rest of the State-supported system (recent passenger surveys also show higher than corridor average bike mode of access within Solano, as discussed below in section 2.9). CCJPA has developed a set of principles for bicycle access which focus primarily on improving on-board train provision, but which are likely to mean additional secure bicycle storage capacity at stations – bike lockers, locked bike parking - than in previously approved stations.

Additional CCJPA policies were adopted at the time of the 2006 revision to station policy (see Appendix A) that are related to expansion of service within the corridor, extension of service outside the corridor limits, and policy for retention of train service to current stations, none of which currently directly impact Solano County.

2.5 POTENTIAL SOLANO-SPECIFIC STATION CRITERIA

The planned Fairfield-Vacaville station met all of the current Capitol Corridor station criteria at the time it was proposed. In addition, prior to seeking station approval, the STA helped secure funding for off-site track improvements that improved overall system on-time performance, in anticipation of the potential for impacts to on-time performance when the new station comes on line. The Capitol Corridor system has benefitted from these improvements for years as the new train station and its on-site improvements were designed, funded and initiated.

Final approval of the Fairfield-Vacaville station still required extensive additional mitigating measures and analysis, as shown below. These improvements were incorporated into the City of Fairfield Specific Plan for the train station and surrounding area, and will be completed before the new train station is opened. Those improvements are:

- The construction of additional siding facilities for freight trains serving the Tolenas Industrial Park in Fairfield.
- Grade separation of Peabody Road to accommodate the station tracks and pedestrian undercrossing access to the platform.

The process of identifying and implementing off-site and on-site improvements demonstrates that, for any potential future stations on the Capitol Corridor system, meeting all of the basic criteria is therefore not a

guarantee of station stop approval.

These are significant additional investments required to secure a successful and well-integrated new station stop to the Capitol Corridor, but they also represent a very high cost threshold for cities considering new stations, and an order of magnitude greater than "legacy stations" from the earlier 20th century passenger era or even stations approved as recently as the early 1990s in the Southern Pacific era.

Looking ahead to potential future stations, Solano has an opportunity in the 2014 Rail Facilities Plan Update to establish its own criteria, reflect local conditions and demonstrate community support, but with a clear understanding of the much higher cost thresholds for establishing new stations today than for previous rounds of station approvals.

There have also been changes in policy and regional funding requirements for local jurisdictions seeking support for new stations. In addition to the overall higher cost threshold for station sponsors, the expected commitment by local jurisdictions to transit supportive development has been formalized by the Metropolitan Transportation Commission (MTC), the federally designated Metropolitan Planning Organization (MPO) through the MTC-required Priority Development Area and Station Area planning process since the 2006 policies were adopted.

Since CCJPA and the host railroad ultimately determine whether any station stop will be approved, it makes sense to integrate any local criteria with the baseline established by CCJPA. The Solano-specific “Match and Refine” criteria (Fig. 6) therefore incorporate the approved CCJPA polices and:

- Allow local Solano jurisdictions to establish their own priorities within these in terms of amenities, readiness for future expansion and phasing
- Expand the CCJPA criteria to require specific commitments by local jurisdictions to land-side improvements in the areas of multimodal access (auto, transit bike, walk), parking provision and safety measures
- Define consistent local connecting transit service/”last mile” commitments
- Establish requirements for fully determining both capital and operations and maintenance costs and needed funding for new station facilities
- Ensure that proposed Solano stations are consistent with the regional planning and funding requirements, by requiring them to conform to the regional PDA/Station Area Plan process (and in so doing update the methodologies for determining multimodal access improvements for the station from the descriptions in the 2006 policy)

In short, *Match and Refine* criteria would reflect a likely higher level of long-term commitment and likely greater overall cost commitment by the local jurisdictions in order to increase the likelihood of additional stations in Solano County.

Figure 5 Summary of Current Station Stop Criteria

3 Principles	Criteria	Item	Notes
Meet Station Standards	**Ridership**	Min daily average ridership projections of 10 boardings / alightings per train within the first 6 months of CCJPA train service	Several current stations served on the Corridor do not meet this requirement
	Design Criteria	Platforms will be a minimum of 700 ft. in length and 8 inches above top-of-rail (any deviations or exemptions require approval by host railroad and/or CCJPA/Amtrak)	Replaces previous policy of 400 ft. min length, with impacts on several projects planned prior to policy change (e.g. Dixon)
		Goal of having stations separated by a minimum of 5 miles	
		Design will provide access to platforms so that passengers never cross a mainline track (e.g., grade separated access to island platform, station-only track not used by freight trains)	Grade separation requirement brings major design safety improvements but significant costs
	Multi Modal Access	An intermodal transit connection plan must be developed by the station project sponsor that may include joint ticketing or transit transfer with the CCJPA trains	Current policy allows wide latitude for local connecting transit agencies
		Requirements for parking based upon a parking study prepared by project sponsor that will consider: ADA compliance, non-motorized vehicle access, current and future adjacent land uses, baseline (and future) ridership projections, transit and carpool/drop-off connectivity, transit-orientated development plans	Requirements will likely be influenced by priority development area (PDA) plans underway since policy was adopted
		Secure storage bike racks/lockers will be provided at platforms or inside station passenger waiting areas	CCJPA bike plan developed since 2006 has enhanced bike emphasis
	Passenger Amenities	Canopy shelters to provide seating for 12 people and accommodate 2 wheelchairs with capacity to add more shelters to meet future demand	Amtrak's station design guidelines also apply
		Ticket vending machines(s) and associated communication equipment provided at platforms (under canopy) or inside passenger waiting areas	Amtrak's station design guidelines also apply
		Passenger Information Display System (PIDS) provided at platforms and inside station passenger waiting areas, based on CCJPA design specs	Amtrak's station design guidelines also apply
	Safety & Security	Install security cameras on platforms, waiting areas, station facilities, and parking areas with the connecting communication system to be developed as part of design plans	Amtrak's station design guidelines also apply
		Emergency call boxes will be provided, at a minimum, at all unstaffed stations	Amtrak's station design guidelines also apply
		Local law enforcement agency will patrol and inspect station and parking facilities	Requires long-term local jurisdiction financial commitment
		Bomb-resistant trash receptacles will be provided at platforms and inside station passenger waiting areas	Amtrak's station design guidelines also apply
Have Support of Host Railroad	**Railroad Approval**	Coordination/approval of station design plans with "host" railroad	For Solano County this effectively means the support of Union Pacific Railroad at all stages of the process
Funding Plan	**Funding**	Project Sponsor has to provide a complete Funding Plan	

Figure 6 Proposed Solano-Specific Station Criteria

Match and Refine CCJPA Criteria

Criteria	Item	Notes
Ridership	Min daily average ridership projections of 10 boardings / alightings per train for **weekday services** within the first 6 months of CCJPA train service	Better reflects the commute oriented trips made by Solano riders
	Any additional station projects will, if necessary, mitigate the schedule impacts of additional stops in order to maintain overall Capitol Corridor-wide travel times.	Ensures that riders at existing station stops are not adversely affected by new station stops on the Corridor.
Design Criteria	Platforms will be a minimum of 700 ft. in length and 8 inches above top-of-rail (any deviations or exemptions require approval by host railroad and/or CCJPA/Amtrak)	Matches CCJPA criteria
	Goal of having stations separated by a minimum of 5 miles	Potential Dixon and Lake Herman Benicia locations meet this criterion
	Design will provide access to platforms so that passengers never cross a mainline track for both side and island platforms. Station-only tracks not used by freight trains are exempt from this provision	Clarifies ambiguity in current policy and minimizes unnecessary large-scale capital costs
Multi Modal Access	Project Sponsors will develop Station Area or Priority Development Area Plans (PDAs) as appropriate, within a half-mile radius of the station, with a clear identification of the number of existing and planned housing units and jobs, market demand analysis, affordable housing, multi-modal connectivity including pedestrian-friendly design standards, strategies to ensure ADA accessibility, parking demand analysis, infrastructure development, implementation plan and financing strategies	Aligns Solano station planning efforts with current local and MPO standards
	Requirements for parking and non-motorized access will be established by the project sponsor undertaking a multimodal access study utilizing CCJPA-approved ridership forecasts and assumptions in the Station Area Plan or PDA as appropriate	Ensures consistency in ridership forecasts for a local station within the overall rail system.Gives project sponsor/local jurisdiction more control over multimodal access requirements for their station
	An intermodal transit connection service plan will be developed by the station project sponsor that will guarantee local transit connections or equivalent "last-mile" provision meeting all trains serving Solano stations	Refines current policy to guarantee local transit connectivity
	Secure storage bike racks/lockers will be provided at platforms or inside station passenger waiting areas	Matches CCJPA criteria
Passenger Amenities	Canopy shelters to provide seating for 12 people and accommodate 2 wheelchairs with capacity to add more shelters to meet future demand	Matches CCJPA criteria
	Ticket vending machines(s) and associated communication equipment provided at platforms (under canopy) or inside passenger waiting areas	Matches CCJPA criteria
	Passenger Information Display System (PIDS) provided at platforms and inside station passenger waiting areas, based on CCJPA design specs	Matches CCJPA criteria
Safety & Security	Install security cameras on platforms, waiting areas, station facilities, and parking areas with the connecting communication system to be developed as part of design plans	Matches CCJPA criteria
	Emergency call boxes will be provided, at a minimum, at all unstaffed stations	Matches CCJPA criteria
	Local law enforcement agency will patrol and inspect station and parking facilities	Matches CCJPA criteria
	Bomb-resistant trash receptacles will be provided at platforms and inside station passenger waiting areas	Matches CCJPA criteria
Railroad Approval	Coordination/approval of station design plans with “host” railroad	Matches CCJPA criteria
	Establish station location memorandum of understanding (MOU) with host railroad and CCJPA before proceeding to detailed design	Refines current criteria to establish station location in principle prior to commitment of substantial design or preconstruction resources
Funding	Project Sponsor has to provide a complete Funding Plan, identifying capital costs for initial operating facility, future long-term expansion cost and operating and maintenance plan, including mid-life upgrades for lifecycle of the facility	Refines the funding plan requirement to identify specifically out front and long-term capital costs, as well as commitment by the project sponsor to maintain the station facility.Note that the PDA/ Station area plans will clarify funding/financing strategies

Figure 7 CCJPA Station and Service Policy, 2006

PRINCIPLES FOR REVISED POLICIES ON STATIONS AND TRAIN SERVICE
CAPITOL CORRIDOR JOINT POWERS AUTHORITY
(January 2006)

POLICY FOR NEW STATION

- Update level of train service (24 weekday, 18 weekend) and number of stations served (16)
- Maintain current criteria and add/update the following new standards:
  - Minimum daily average ridership projections of ten (10) boarding or alightings per train within the first six (6) months of CCJPA train service to the new station.
  - Canopy shelters to provide seating for twelve (12) people (and accommodate two (2) wheelchairs) with capacity to add more shelters to meet future demand
  - Coordination/approval of station design plans with "host" railroad
  - Local law enforcement agency will patrol and inspect station and parking facilities
  - Install security cameras on platforms, waiting areas, station facilities, and parking areas with the connecting communication system to be developed as part of design plans
  - Design will provide access to platforms so that passengers never cross a mainline track (e.g., grade separated access to island platform, station-only track not used by freight trains)
  - Platforms will be a minimum of 700 feet in length and eight (8) inches top-of-rail (any deviations or exemptions will require approval by host railroad and/or CCJPA/Amtrak)
  - Emergency call boxes will be provided, at a minimum, at all unstaffed stations
  - Passenger Information Display System (PIDS) real time electronic message signs will be provided at platforms and inside station passenger waiting areas, based on CCJPA design specifications
  - Bomb-resistant trash receptacles will be provided at platforms and inside station passenger waiting areas
  - Ticket vending machines(s) and associated communication equipment will be provided at either platforms (under the canopy) or inside station passenger waiting areas
  - An intermodal transit connection plan must be developed by the station project sponsor that may include joint ticketing or transit transfer with the CCJPA trains
  - Requirements for parking spaces will be based upon a parking study prepared by the project sponsor that will consider ADA compliance, non-motorized vehicle access, current and future adjacent land uses, baseline (and future) ridership projections, transit and carpool/drop-off connectivity, transit-orientated development plans
  - Secure storage bike racks/lockers will be provided at platforms or inside station passenger waiting areas

POLICY FOR RETENTION OF TRAIN SERVICE TO STATIONS

- Update the minimal ridership standards for continued CCJPA train service to station as follows:
  - Minimum daily average of ten (10) boarding or alightings per train within the first six (6) months of CCJPA train service to the new station
  - Minimum daily average of twelve (12) boarding or alightings per train within two years of CCJPA train service
  - Minimum daily average of fifteen (15) boarding or alightings per train within third year of CCJPA train service
- Develop marketing and operating plans to bring trains back to a station where service had been discontinued

EXPANSION OF SERVICE WITHIN CORRIDOR

- Update standards for trains that are managed by CCJPA for service within corridor (i.e., Regional Rail):
  - Ridership and revenues must be reviewed and approved by CCJPA
  - Any financial operating costs (expenses net of revenues) including any CCJPA management or administrative costs and additional rail equipment must be provided by service sponsor(s)
  - Net cost per train-mile (TM) must be equal to/lower than the current CCJPA train service net costs per TM
  - System operating (or farebox) ratio must be equal to/greater than the current CCJPA train system operating ratio

EXTENSION OF TRAIN SERVICE

- Any extension of CCJPA train service outside the Auburn-Sacramento-Oakland-San Jose corridor shall not drain resources that would prevent the CCJPA from implementing its core service expansion goals for the corridor pursuant to the *Vision Plan*
- Extensions of CCJPA train service outside the corridor shall not denigrate the core CCJPA train service, including but not limited to on-time performance and financial performance (e.g., operating costs, farebox ratio)
- Any financial operating costs (expenses net of revenues) including any CCJPA management or administrative costs and additional rail equipment must be provided by service extension sponsor(s)

ADOPTED FEBRUARY 15, 2006

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2.6 FUTURE CAPITOL CORRIDOR/AMTRAK STATIONS

The Solano-specific station policy in Appendix 3 was adopted by the STA Board during the course of the Plan development.

The Plan has articulated a Solano county-level enhancement of existing adopted CCJPA policies governing the requirements for new stations to be served by Capitol Corridor trains.

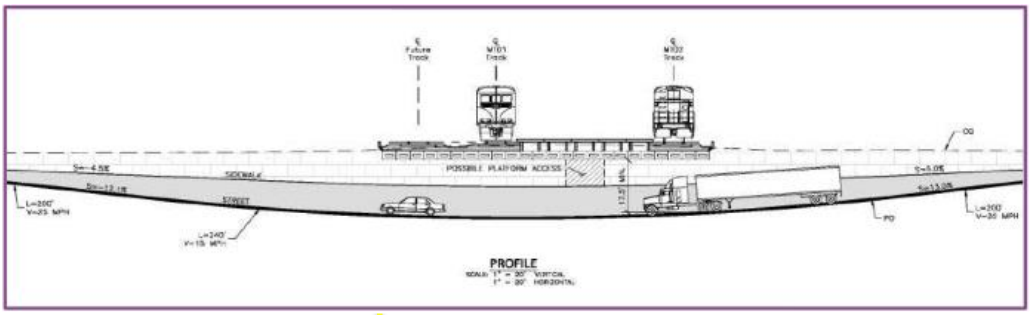
The original 1995 Solano rail plan identified several options for developing additional stations serving Dixon and Benicia. These locations included six sites in these cities. In the intervening years, several significant changes and local investments mean that this broad list should now be narrowed accordingly:

2.6.1 Dixon: Major Changes since 1995

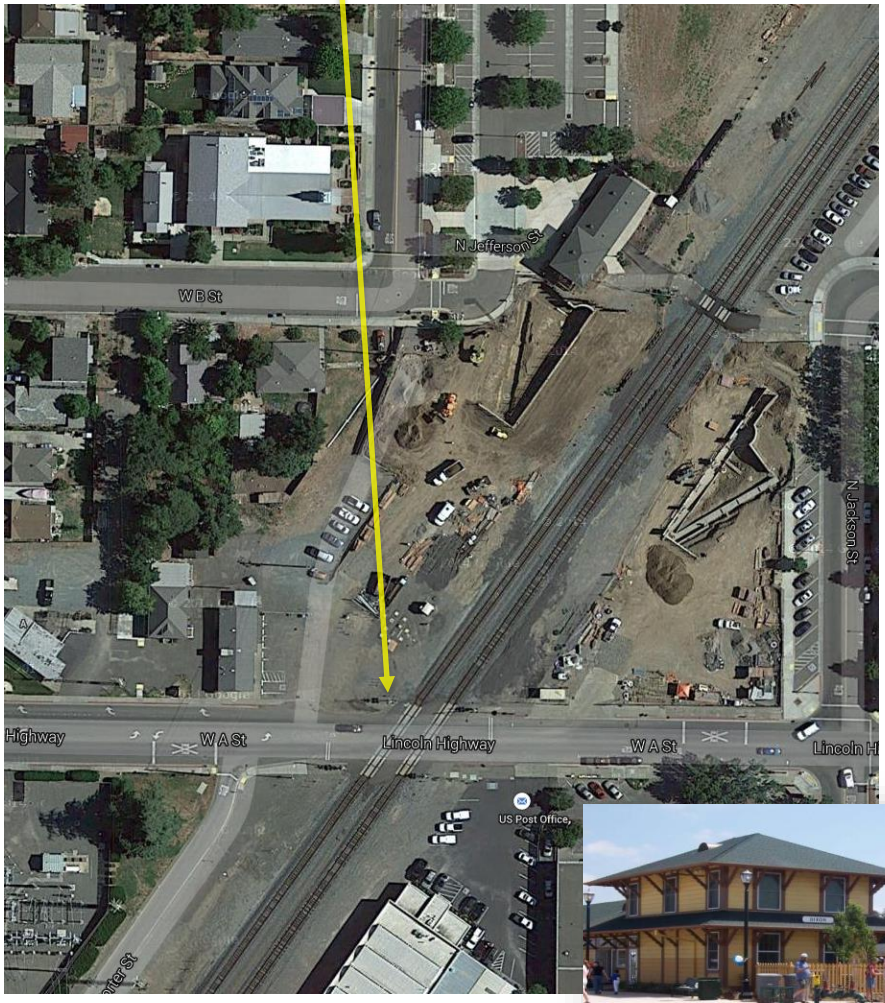
- Substantial investment has been made by local agencies at the downtown Dixon station location (see Fig. 8), including:
    - A 140-space park and ride lot for a future station, including electric vehicle power charging station
    - A classic downtown depot building capable of handling all future passenger needs
    - The elimination of a major safety concern by grade separation of the West B Street grade crossing at the downtown station location under the tracks, with physical capacity for a future center island platform access via the undercrossing
- In addition, concerns expressed by the operator and railroad owner over proximity of the potential downtown station platform adjacent to the City's major thoroughfare, have been considered by the City: a concept design of a grade separation of the A Street crossing of the tracks, (one of the stated requirements of the railroad for establishing a stop at the downtown location) has been prepared, indicating that a horizontal and vertical alignment is feasible (although not without major impacts to the downtown).

- Figure 8 portrays the City's concept for an A Street undercrossing.

Figure 8 Dixon A Street Undercrossing Concept



(City of Dixon/STA)



2.6.2 Benicia: Major Changes since 1995

- Both the railroad and passenger operators are concerned about train movement reliability and delays at the Benicia narrows imposed by ship traffic through the existing movable span rail bridge. They are actively exploring alternatives for a high-level passenger only crossing. Although such a major project would be a very long-term project (well beyond the 10-year Plan horizon), it would by necessity bypass any of the downtown Benicia locations reviewed in the 1995 plan.
- In addition, the Capitol Corridor station criteria adopted since the 1995 plan was prepared require a minimum of 5 mile station spacing and proximity to the Martinez station would eliminate all but the Lake Herman Road location.

The lower track location at Lake Herman Road is at 1ft elevation and likely impacted by future sea level rise (see section 3.3). This was not a major consideration or concern at the time of the previous rail facilities plan 20 years ago, but is a significant issue now and in the future.

There are no other locations on the UPRR main line in Solano County that could be considered for future passenger rail service at this time. Of the two locations identified in the 1995 Plan, the Dixon location is the recommended facility for longer-term service if additional Capitol Corridor stops in Solano County are to be considered.

The Dixon location should be carried forward for consideration when the Solano Rail Facilities Plan is next updated, a task anticipated for the timeframe of 2020 to 2025.

2.7 RIDERSHIP POTENTIAL

2.7.1 1995 Rail Plan Ridership and Current Ridership Comparison

Major changes have occurred since the 1995 Rail Plan was prepared. Most significant is the five-fold growth in service levels of Capitol Corridor Service. For comparison, the present-day ridership by station is shown alongside the similar-year forecast made in 1995 in Figure 9. The 1995 plan made some assumptions about service frequency that differ from actual provision. For example, the 1995 plan ridership forecast was developed with both limited stop express service and overlay of more comprehensive stopping service.

Today's ridership reflects service that stops at all stations, with a frequency (30 daily trains today) somewhat less than the maximum service that was projected in the earlier plan for 2015 (up to 38 daily trains).

Figure 9 Current Ridership vs.1995 Plan Projection

Solano Stations: Current and 1995 plan forecast

95 plan assumed 38 trains daily FFV, 18 trains other stations 2015: 30 actual trains daily

Year	Benicia, CA	Suisun-Fairfield, CA (SUI)	Fairfield-Vacaville, CA (FFV)	Dixon, CA	Solano Total
2015 Forecast ('95 plan)	*400*	*900*	*1,200*	*450*	*2,950*
2015 Actual	**-**	**730**	**-**	**-**	**730**

2.7.2 Current Ridership Summary

Figure 10 shows current Solano major origins and destinations for a typical month (late spring, when there are fewer seasonal variations) in 2014.

Figure 10 Solano Passenger Rail Primary Origins/Destinations 2014

April 2014

Origin-Destination Table

Orig	ARN	RLN	RSV	SAC	DAV	SUI	MTZ	RIC	BKY	EMY	OKJ	OAC	HAY	FMT	GAC	SJC	Grand Total:
ARN			4	394	45	29	64	73	13	142	44	1			0		808
RLN	1			370	102	11	40	34	11	74	39	11		0	0		682
RSV	2			240	242	64	55	63	38	218	58	10					980
SAC	247	367	195		2562	2319	5453	4622	1760	8233	3518	968	614	971	746	2327	33934
DAV	43	100	225	2599		526	1989	2324	2159	3203	1289	310	140	332	361	665	15955
SUI	28	17	64	2185	546		743	520	549	1347	675	154	36	51	74	154	6989
MTZ	53	40	107	4883	1845	782		216	177	426	177	23	26	6	118	172	9028
RIC	49	26	67	4397	2092	585	173		6	55	27	6	4	16	214	80	7791
BKY	28	11	45	1820	2119	517	184	8		18	98		20	26	644	508	6046
EMY	138	65	230	7927	3102	1415	450	62	30		164	18	43	270	551	695	15142
OKJ	42	38	93	3539	1268	712	166	32	45	72		21	60	23	1006	1057	8153
OAC		10	10	911	263	125	16	3	1	22	62			3	362	271	2059
HAY	5		4	612	119	45	19	3	22	33	61				466	123	1512
FMT	1	2	2	1001	296	51	4	15	39	284	45	2	1		52	54	1847
GAC	4		7	779	381	79	115	190	635	540	1007	382	486	90		7	4320
SCC				211	138	9	27	19	118	175	162	101	13	15	3	7	897
SJC	5	0	17	2709	658	158	203	118	577	751	1241	352	150	60	10		6657
Grand Total:	646	676	1070	34577	15778	7427	9701	8302	6180	15593	8667	2359	1593	1863	4607	6120	122800

SUI= Suisun-Fairfield station

2.7.3 Forecast Ridership: Model and Methodology

To establish station-specific forecasts for the current Solano Rail Facilities Plan Update, the study team utilized an approach, endorsed by STA and CCJPA staff, which used the California state rail model forecast runs as the foundation of the passenger volume forecasts. The advantages of this approach are that it:

- Ensures consistency with other corridor-wide station ridership forecasts
- Avoids the use of off-model single station direct demand forecasts that could be perceived as “advocacy efforts” by individual jurisdictions, rather than objective corridor-wide forecasts
- Provides a common countywide baseline of growth assumptions by individual jurisdiction,

reflected in State Department of Finance forecasts

- Takes account of adjacent station ridership impacts from Solano current/future stations (the adjacency effect)

2.7.4 Forecast Ridership: Current and Future 10-year

Using outputs from the state rail model used by both CCJPA staff and Caltrans division of rail, the following ridership was generated, using a lower and upper range approach to generate outputs.

Several Priority Development Area (PDA) planning efforts were commencing during the preparation of the Plan Update. Those in the SUI and FFV station areas had not yet generated detailed numbers of units in parcels within each station shed, but overall targets for each were available and applied. Against this background such, the ridership numbers for both stations could be considered conservative, and an indicative range, rather than an absolute target ceiling for planning purposes.

Current station services are assumed for both the SUI and FFV stations, although CCJPA is discussing the potential of adding future express train service that could only access one station in Solano County.

This approach used the following assumptions to adapt the original state rail model data:

Lower level of range: direct application of California Department of Finance (DoF) growth assumptions by jurisdiction to 2024/25, plus Plan Bay Area growth assumptions for each jurisdiction.

Upper level of range: overlay of PDA and Station Area Plan (SAP) total residential target numbers, on the DoF assumptions. Note: commercial floor space numbers were not yet available from the PDA studies. A single major trip generator such as a large single-site employer, healthcare facility or education campus could generate further trips beyond those shown.

For both lower and upper level estimates, the assumptions used are described in Appendix 4.

Figure 11 Solano Stations Ridership Projection

Year	Suisun-Fairfield, CA (SUI)		Fairfield-Vacaville, CA (FFV)		Solano Total	
	Low	High	Low	High	Low	High
Actual FY 2013	196,000		-		196,000	
2018	106,700	139,600	113,800	137,500	220,600	277,000
2024	121,800	206,200	145,300	186,600	267,100	392,800

Low: DoF based growth + Fairfield, Suisun Cities PBA growth

High: DoF based growth+ Fairfield SAP/PDA, Suisun PDA

Solano Stations 2-hr peak ridership: Current and 1995 plan forecast

1995 plan assumed 38 trains daily FFV, 18 trains other stations 2015: 30 actual trains daily

Year	Suisun-Fairfield, CA (SUI)	Fairfield-Vacaville, CA (FFV)	Dixon, CA	Solano Total
2015 Forecast (1995 plan)	*135*	*180*	*68*	*383*
2015 Actual	**110**	**-**	**-**	**110**
*2024 Forecast (2015 plan)**	***108***	***101***	*75*	*284*

* high end of 2015 plan forecast range; 2-hr peak uses Amtrak 2013 stations guidelines methodology

Solano Stations average daily passenger on/offs per train

1995 plan assumed 38 trains daily FFV, 18 trains other stations 2015: 30 actual trains daily

Year	Suisun-Fairfield, CA (SUI)	Fairfield-Vacaville, CA (FFV)	Dixon, CA	Solano average
2015 Forecast (1995 plan)	*28*	*32*	*25*	*28*
2015 Actual	**23**	**-**	**-**	*23*
*2024 Forecast (2015 plan)**	***24***	***23***	*16*	*21*

* high end of 2015 plan forecast range; 2-hr peak assumes max 40-min headways per CCJPA agreement

It is clear from these tables that the Fairfield-Vacaville station may initially draw some passengers from the Suisun-Fairfield station, but that both stations will be viable and continue to meet both the STA and CCJPA station requirements of a minimum average daily ridership projection of 10 boardings/lightings per train, based on typical peak hour derivations from daily ridership totals. Future residential growth nearby both stations has a substantial beneficial impact on their adjacent stations' ridership growth.

The Dixon station did not have a base ridership projection available within the state rail model

and therefore could not be subject to the forecast methodology used for SUI and FFV. An alternative off-model approach was used which took the 1995 Solano Rail Plan forecast, discounted ridership for level of rail service and 1995 vs. 2015 actual data, and projected ten years ahead.

Based on this off-model projection, a future Dixon station would appear to have ridership considerably below SUI and FFV, but would likely meet the minimum boarding requirements in CCJPA stations policy, at least in the peak. However, Dixon would need to be incorporated into a formal state rail model run in order for a consistent picture of ridership to be developed alongside the FFV and SUI stations.

2.7.5 Inter-county ridership

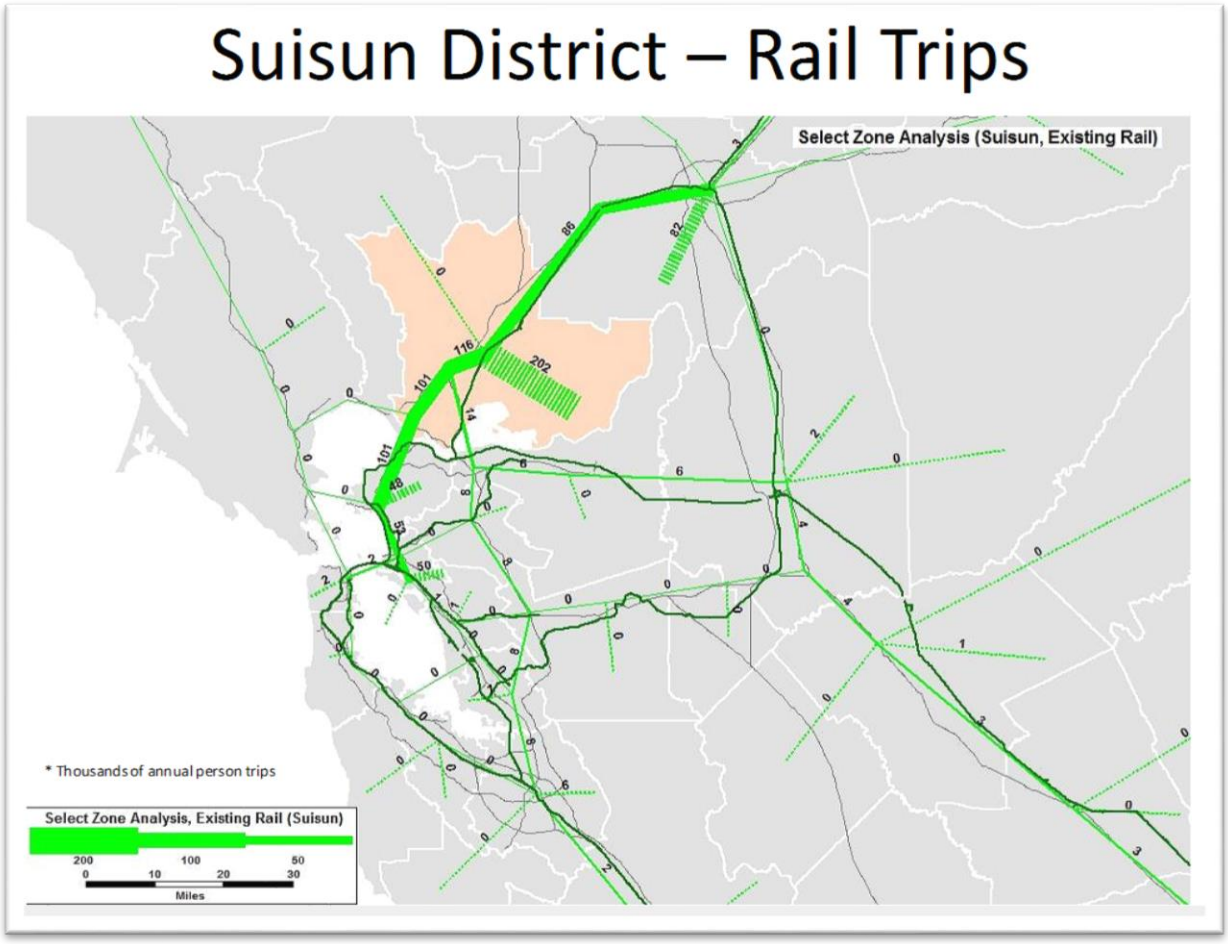
During the latter stages of the preparation of this technical memorandum, the consultant team and STA staff were fortunate to have access to a new state level travel demand modeling effort being led by the California State Transportation Agency (CalSTA).

Although in its development stages, it provided a useful inter-county level of travel volume on the current major travel corridors. Within these overall trips by all modes, a breakout by the rail mode has been developed. Although this is at a relatively course grained level currently (for example Solano County is treated as a single district ("Suisun").

This modeling effort promises additional resources in planning the future characterization of investments in the intercity rail network. The modeling assumptions and methodology are summarized in Appendix 5.

These indicate that rail currently has approximately 2.6% share of the travel market in the Sacramento - Bay Area corridor. Summary of results are shown in Figure 12.

Figure 12 CalSTA Draft Model Results: Rail Mode Share for Solano County



2.8 RAILROAD OPERATIONS

2.8.1 Passenger Service and Freight Railroads: Background

Freight Railroads' perspective on long-term capacity is a critical factor in shaping the level of passenger service within the current landlord-tenant operating arrangement:

- Their primary revenue source is freight movement, not passenger service
- They take the "long view" of their enterprise
- They recognize that investments and commitments (e.g. agreeing to accommodate passenger service) last for decades and can constrain their capacity and operational flexibility far into the future
- This, despite the fact that they cannot predict freight traffic far ahead (typically, not far beyond the current business cycle).

Capacity, Costs and Agreements:

- Railroads are informed by examples where changes in freight demand mean they wish they had the capacity they signed away just a few years ago:
    - Metrolink, Los Angeles
    - Metra, Chicago
    - (even the California corridors)
- Most of the "cheap" capacity has already been built
- Freight railroads don't want to have passenger operators build the less expensive projects only to leave the remaining (expensive) projects to be built by the railroads

2.8.2 Passenger Service on UPRR: Current and Future 10-year level of service

Based on review with CCJPA staff, the following assumptions for passenger service were established, based on the Capitol Corridor/UPRR agreement ceiling. This agreement is the critical foundation for future planning of passenger trains serving Solano County within the 10-year plan horizon:

- Weekday daily trains: 30 trains/15 round trips with Solano County (Sacramento-Oakland)
- 20 daily trains (10 round trips) extending to Roseville
- 22 daily trains (10 round trips) extending to San Jose
- Span of service (Solano stations) 5 AM to 11PM
- Peak period headways: 40 minutes

Such clearly defined operating framework was not in place when the 1995 Solano Rail Plan was prepared. As such, both the 1995 study and subsequent planning efforts explored additional service options, which are now infeasible within this operating framework for the Plan's 10-year horizon.

These included regional rail overlay service between Dixon and Auburn, service extensions to Reno, local East Bay overlay service on the Martinez-Oakland segment and other similar concepts.

Figures 13-16 provide a potential schedule for Capitol Corridor service developed for extended services at the current year.

It shows station stops for both Suisun-Fairfield and Fairfield-Vacaville.

Appendix 6 shows the current (Spring 2015) service schedule for comparison.

Comparison with the future service shows broadly the current level of service but the following enhancements:

- Reduction in overall corridor running times of the order of 5-10 minutes
- Maintenance in overall running times within the County with the addition of the Fairfield-Vacaville station
- Additional service extensions at the western and eastern ends of the corridor to Roseville and San Jose respectively

While these do not directly increase level of service for both the current Suisun-Fairfield (SUI) and Fairfield-Vacaville (FFV) stations, they do provide significant enhancements in regional connections by train from both stations to the current destinations and also to those beyond Oakland and Sacramento.

The subsequent ridership forecasts demonstrate the value of these additional regional extensions in service with passenger growth to destinations beyond the current core Oakland-Sacramento corridor, with an additional almost 200,000 annually, approximately 10,000 of these to Solano.

Figure 13 Capitol Corridor Potential Schedule with FFV and SUI stops (Weekdays) Westbound

Train number			521	523	525	527	529	531	533	535	537	541	543	545	547	549	551
Days of operation*	Mi		M-F	M-F	M-F	M-F	M-F	M-F	M-F	M-F	M-F	M-F	M-F	M-F	M-F	M-F	M-F
Auburn, CA	0	Dp					6:30 AM				ARN Bus		ARN Bus			ARN Bus	ARN Bus
Rocklin, CA	14	Dp					6:53 AM				RLN Bus		RLN Bus			RLN Bus	RLN Bus
Roseville, CA	18	Dp		4:58 AM	5:48 AM	6:28 AM	7:03 AM			9:38 AM	11:38 AM		3:03 PM		5:08 PM	6:38 PM	8:38 PM
Sacramento, CA	35	Ar		5:27 AM	6:17 AM	6:57 AM	7:32 AM			10:07 AM	12:07 PM		3:32 PM		5:37 PM	7:07 PM	9:07 PM
		Dp	4:30 AM	5:30 AM	6:20 AM	7:00 AM	7:35 AM	8:20 AM	10:00 AM	10:10 AM	12:10 PM	2:10 PM	3:35 PM	4:40 PM	5:40 PM	7:10 PM	9:10 PM
Davis, CA	49	Dp	4:45 AM	5:45 AM	6:35 AM	7:15 AM	7:50 AM	8:35 AM	10:15 AM	10:25 AM	12:25 PM	2:25 PM	3:50 PM	4:55 PM	5:55 PM	7:25 PM	9:25 PM
Fairfield-Vacaville, CA	71	Dp	5:05 AM	6:05 AM	6:55 AM	7:35 AM	8:10 AM	8:55 AM	10:35 AM	10:45 AM	12:45 PM	2:45 PM	4:10 PM	5:15 PM	6:15 PM	7:45 PM	9:45 PM
Suisun-Fairfield, CA	75	Dp	5:11 AM	6:11 AM	7:01 AM	7:41 AM	8:16 AM	9:01 AM	10:41 AM	10:51 AM	12:51 PM	2:51 PM	4:16 PM	5:21 PM	6:21 PM	7:51 PM	9:51 PM
Martinez, CA	93	Dp	5:30 AM	6:30 AM	7:20 AM	8:00 AM	8:35 AM	9:20 AM	11:00 AM	11:10 AM	1:10 PM	3:10 PM	4:35 PM	5:40 PM	6:40 PM	8:10 PM	10:10 PM
Richmond, CA	112	Dp	5:55 AM	6:55 AM	7:45 AM	8:25 AM	9:00 AM	9:45 AM	11:25 AM	11:35 AM	1:35 PM	3:35 PM	5:00 PM	6:05 PM	7:05 PM	8:35 PM	10:35 PM
Berkeley, CA	118	Dp	6:02 AM	7:02 AM	7:52 AM	8:32 AM	9:07 AM	9:52 AM	11:32 AM	11:42 AM	1:42 PM	3:42 PM	5:07 PM	6:12 PM	7:12 PM	8:42 PM	10:42 PM
Emeryville, CA	120	Ar	6:08 AM	7:08 AM	7:58 AM	8:38 AM	9:13 AM	9:58 AM	11:38 AM	11:48 AM	1:48 PM	3:48 PM	5:13 PM	6:18 PM	7:18 PM	8:48 PM	10:48 PM
		Dp	6:10 AM	7:10 AM	8:00 AM	8:40 AM	9:15 AM	10:00 AM	11:40 AM	11:50 AM	1:50 PM	3:50 PM	5:15 PM	6:20 PM	7:20 PM	8:50 PM	10:50 PM
Oakland, CA (Jack London Square)	125	Ar	6:21 AM	7:21 AM	8:11 AM	8:51 AM	9:33 AM	10:11 AM	11:58 AM	12:01 PM	2:01 PM	4:01 PM	5:26 PM	6:38 PM	7:31 PM	9:01 PM	11:08 PM
		Dp	6:23 AM	7:23 AM	8:13 AM	8:53 AM		10:13 AM		12:03 PM	2:03 PM	4:03 PM	5:28 PM		7:33 PM	9:03 PM	
Oakland Coliseum, CA	130	Dp	6:32 AM	7:32 AM	8:22 AM	9:02 AM	9:40 AM	10:22 AM	12:05 PM	12:12 PM	2:12 PM	4:12 PM	5:40 PM		7:44 PM	9:12 PM	
Hayward, CA	138	Dp	6:43 AM	7:43 AM	8:32 AM	9:13 AM		10:33 AM		12:23 PM	2:23 AM	4:23 PM	5:52 PM		7:59 PM	9:24 PM	
Fremont-Centerville, CA	150	Dp	6:59 AM	7:59 AM	8:48 AM	9:29 AM		10:49 AM		12:39 PM	2:39 PM	4:39 PM	6:09 PM		8:17 PM	9:50 PM	
Santa Clara, CA (Great America)	161	Dp	7:16 AM	8:16 AM	9:05 AM	9:46 AM		11:06 AM		12:56 PM	2:56 PM	4:56 PM	6:27 PM		8:34 PM	10:07 PM	
Santa Clara, CA (University)	165	Dp	7:24 AM	8:24 AM	9:13 AM	9:54 AM		11:14 AM		1:04 PM	3:04 PM	5:04 PM	6:35 PM		8:42 PM	10:15 PM	
San Jose, CA	168	Ar	7:38 AM	8:38 AM	9:27 AM	10:13 AM		11:28 AM		1:18 PM	3:18 PM	5:11 PM	6:48 PM		8:58 PM	10:29 PM	

*Except public holidays, when service follows weekend schedule

Figure 14 Capitol Corridor Potential Schedule with FFV and SUI stops (Weekdays) Eastbound

Train number			520	522	524	526	528	530	532	534	536	538	540	542	544	546	548
Days of operation*	Mi		M-F	M-F	M-F	M-F	M-F	M-F	M-F	M-F	M-F	M-F	M-F	M-F	M-F	M-F	M-F
San Jose, CA		Dp		5:20 AM	6:40 AM		9:05 AM	10:56 AM	12:20 PM	1:40 PM		3:10 PM	3:40 PM	4:20 PM	5:50 PM	7:15 PM	
Santa Clara, CA (University)	74	Dp		5:26 AM	6:46 AM		9:11 AM	11:02 AM	12:26 PM	1:46 PM		3:16 PM	3:46 PM	4:26 PM	5:56 PM	7:21 PM	
Santa Clara, CA (Great America)	78	Dp		5:34 AM	6:54 AM		9:19 AM	11:10 AM	12:34 PM	1:54 PM		3:24 PM	3:54 PM	4:34 PM	6:04 PM	7:29 PM	
Fremont-Centerville, CA	89	Dp		5:51A	7:11 AM		9:38 AM	11:29 AM	12:51 PM	2:13 PM		3:43 PM	4:13 PM	4:51 PM	6:21 PM	7:46 PM	
Hayward, CA	101	Dp		6:06 AM	7:26 AM		9:54 AM	11:45 AM	1:06 PM	2:29 PM		3:59 PM	4:29 PM	5:06 PM	6:36 PM	8:01 PM	
Oakland Coliseum, CA	109	Dp		6:16 AM	7:36 AM	8:55	10:04 AM	11:55 AM	1:16 PM	2:39 PM		4:09 PM	4:39 PM	5:16 PM	6:46 PM	8:11 PM	
Oakland, CA (Jack London Square)	114	Ar		6:23 AM	7:43 AM	9:03 AM	10:13 AM	12:13 PM	1:23 PM	2:48 PM		4:18 PM	4:48 PM	5:23 PM	6:53 PM	8:18 PM	
		Dp	5:25 AM	6:25 AM	7:45 AM	9:15 AM	10:15 AM	12:15 PM	1:25 PM	2:50 PM	3:30 PM	4:20 PM	4:50 PM	5:30 PM	6:55 PM	8:20 PM	9:25 PM
Emeryville, CA	119	Ar	5:33 AM	6:33 AM	7:53 AM	9:23 AM	10:23 AM	12:23 PM	1:33 PM	2:58 PM	3:38 PM	4:28 PM	4:58 PM	5:38 PM	7:03 PM	8:28 PM	9:33 PM
		Dp	5:35 AM	6:35 AM	7:55 AM	9:25 AM	10:25 AM	12:25 PM	1:35 PM	3:00 PM	3:40 PM	4:30 PM	5:00 PM		7:05 PM	8:30 PM	9:45 PM
Berkeley, CA	121	Dp	5:39 AM	6:39 AM	7:59 AM	9:29 AM	10:29 AM	12:29 PM	1:39 PM	3:04 PM	3:44 PM	4:34 PM	5:04 PM	5:49 PM	7:09 PM	8:34 PM	9:49 PM
Richmond, CA	127	Dp	5:47 AM	6:47 AM	8:07 AM	9:37 AM	10:37 AM	12:37 PM	1:47 PM	3:12 PM	3:52 PM	4:42 PM	5:12 PM	5:57 PM	7:17 PM	8:42 PM	9:57 PM
Martinez, CA	146	Dp	6:14 AM	7:14 AM	8:34 AM	10:04 AM	11:04 AM	1:04 PM	2:14 PM	3:39 PM	4:19 PM	5:09 PM	5:39 PM	6:24 PM	7:44 PM	9:09 PM	10:24 PM
Suisun-Fairfield, CA	164	Dp	6:33 AM	7:33 AM	8:53 AM	10:23 AM	11:23 AM	1:23 PM	2:33 PM	3:58 PM	4:38 PM	5:28 PM	5:58 PM	6:43 PM	8:03 PM	9:27 PM	10:43 PM
Fairfield-Vacaville, CA	168	Dp	6:39 AM	7:39 AM	8:59 AM	10:29 AM	11:29 AM	1:29 PM	2:39 PM	4:04 PM	4:44 PM	5:34 PM	6:04 PM	6:49 PM	8:09 PM	9:33 PM	10:49 PM
Davis, CA	190	Dp	6:57 AM	7:57 AM	9:17 AM	10:47 AM	11:47 AM	1:47 PM	2:57 PM	4:22 PM	5:02 PM	5:52 PM	6:22 PM	7:07 PM	8:27 PM	9:52 PM	11:07 PM
Sacramento, CA	204	Ar	7:23 AM	8:10 AM	9:31 AM	11:13 AM	12:01 PM	2:13 PM	3:11 PM	4:36 PM	5:22 PM	6:06 PM	6:36 PM	7:21 PM	8:53 PM	10:28 PM	11:21 PM
		Dp		8:13 AM			12:04 PM		3:14 PM	4:39 PM	5:25 PM	6:09 PM	6:39 PM	7:24 PM			11:24 PM
Roseville, CA	221	Dp		8:42 AM			12:39 PM		3:49 PM	5:14 PM	5:48 PM	6:44 PM	7:14 PM	7:59 PM			11:59 PM
Rocklin, CA	225	Dp			RLN Bus		RLN Bus		RLN Bus		5:56 PM		RLN Bus	RLN Bus	RLN Bus		
Auburn, CA	239	Ar			ARN Bus		ARN Bus		ARN Bus		6:30 PM		ARN Bus	ARN Bus	ARN Bus		

*Except public holidays, when service follows weekend schedule

Figure 15 Capitol Corridor Potential Schedule with FFV and SUI stops (Weekends/Holidays) Westbound

Train number			723	727	729	733	737	741	743	745	747	749	751
Days of operation*	Mi		SaSu	SaSu	SaSu	SaSu	SaSu	SaSu	SaSu	SaSu	SaSu	SaSu	SaSu
Auburn, CA	0	Dp			8:05 AM		ARN Bus		ARN Bus				RN Bus
Rocklin, CA	14	Dp			8:28 AM		RLN Bus		RLN Bus				RLN Bus
Roseville, CA	18	Dp		7:08 AM	8:37 AM	10:08 AM	11:38 AM		3:03P		5:08P		8:38P
Sacramento, CA	35	Ar		7:37 AM	9:07 AM	10:37 AM	12:07 PM		3:32P		5:37P		9:07P
		Dp	5:40 AM	7:40 AM	9:10 AM	10:40 AM	12:10 PM	2:15 PM	3:35 PM	4:40 PM	5:40 PM	7:10 PM	9:10 PM
Davis, CA	49	Dp	5:55 AM	7:55 AM	9:25 AM	10:55 AM	12:25 PM	2:30 PM	3:50 PM	4:55 PM	5:55 PM	7:25 PM	9:25 PM
Fairfield-Vacaville, CA	71	Dp	6:15 AM	8:15 AM	9:45 AM	11:15 AM	12:45 PM	2:50 PM	4:10 PM	5:15 PM	6:15 PM	7:45 PM	9:45 PM
Suisun-Fairfield, CA	75	Dp	6:21 AM	8:21 AM	9:51 AM	11:21 AM	12:51 PM	2:56 PM	4:16 PM	5:21 PM	6:21 PM	7:51 PM	9:51 PM
Martinez, CA	93	Dp	6:40 AM	8:40 AM	10:10 AM	11:40 AM	1:10 PM	3:15 PM	4:35 PM	5:40 PM	6:40 PM	8:10 PM	10:10 PM
Richmond, CA	112	Dp	7:05 AM	9:05 AM	10:35 AM	12:05 PM	1:35 PM	3:40 PM	5:00 PM	6:05 PM	7:05 PM	8:35 PM	10:35 PM
Berkeley, CA	118	Dp	7:12 AM	9:12 AM	10:42 AM	12:12 PM	1:42 PM	3:47 PM	5:07 PM	6:12 PM	7:12 PM	8:42 PM	10:42 PM
Emeryville, CA	120	Ar	7:18 AM	9:18 AM	10:48 AM	12:18 PM	1:48 PM	3:53 PM	5:13 PM	6:18 PM	7:18 PM	8:48 PM	10:48 PM
		Dp	7:20 AM	9:20 AM	10:50 AM	12:20 PM	1:50 PM	3:55 PM	5:15 PM	6:20 PM	7:20 PM	8:50 PM	10:50 PM
Oakland, CA (Jack London Square)	125	Ar	7:31 AM	9:31 AM	11:01 AM	12:31 PM	2:01 PM	4:06 PM	5:26 PM	6:38 PM	7:31 PM	9:01 PM	11:01 PM
		Dp	7:33 AM	9:33 AM	11:03 AM	12:33 PM	2:03 PM	4:08 PM	5:28 PM		7:33 PM	9:03 PM	11:03 PM
Oakland Coliseum, CA	130	Dp	7:42 AM	9:42 AM	11:12 AM	12:42 PM	2:12 PM	4:17 PM	5:40 PM		7:42 PM	9:12 PM	11:12 PM
Hayward, CA	138	Dp	7:53 AM	9:53 AM	11:23 AM	12:53 PM	2:23 PM	4:28 PM	5:52 PM		7:53 PM	9:23 PM	11:23 PM
Fremont-Centerville, CA	150	Dp	8:09 AM	10:09 AM	11:39 AM	1:09 PM	2:39 PM	4:44 PM	6:07 PM		8:09 PM	9:39 PM	11:39 PM
Santa Clara, CA (Great America)	161	Dp	8:26 AM	10:26 AM	11:56 AM	1:26 PM	2:56 PM	5:01 PM	6:27 PM		8:26 PM	9:56 PM	11:56 PM
Santa Clara, CA (University)	165	Dp	8:34 AM	10:34 AM	12:04 PM	1:34 PM	3:04 PM	5:09 PM	6:35 PM		8:34 PM	10:04 PM	12:04 PM
San Jose, CA	168	Ar	8:48 AM	10:48 AM	12:18 PM	1:48 PM	3:18 PM	5:23 PM	6:48 PM		8:48 PM	10:18 PM	12:18 PM

Figure 16 Capitol Corridor Potential Schedule with FFV and SUI stops (Weekends/Holidays) Eastbound

Train number Days of operation*	Mi		720 SaSu	724 SaSu	728 SaSu	732 SaSu	734 SaSu	736 SaSu	738 SaSu	742 SaSu	744 SaSu	746 SaSu	748 SaSu
San Jose, CA		Dp	6:15 AM	7:50 AM	9:50 AM		12:50 PM	2:20 AM	3:20 PM	4:25 PM	5:50 PM	6:50 PM	7:50 PM
Santa Clara, CA (University)	74	Dp	6:21 AM	7:56 AM	9:56 AM		12:56 PM	2:26 PM	3:26 PM	4:31 PM	5:56 PM	6:56 PM	7:56 PM
Santa Clara, CA (Great America)	78	Dp	6:29 AM	8:04 AM	10:04 AM		1:04 PM	2:34 PM	3:34 PM	4:39 PM	6:04 PM	7:04 PM	8:04 PM
Fremont-Centerville, CA	89	Dp	6:46 AM	8:21 AM	10:21 AM		1:21 PM	2:51 PM	3:51 PM	4:56 PM	6:21 PM	7:21 PM	8:21 PM
Hayward, CA	101	Dp	7:01 AM	8:36 AM	10:36 AM		1:36 PM	3:06 PM	4:06 PM	5:11 PM	6:36 PM	7:36 PM	8:36 PM
Oakland Coliseum, CA	109	Dp	7:11 AM	8:46 AM	10:46 AM		1:46 PM	3:16 PM	4:16 PM	5:21 PM	6:46 PM	7:46 PM	8:46 PM
Oakland, CA (Jack London Square)	114	Ar	7:18 AM	8:53 AM	10:53 AM		1:53 PM	3:23 PM	4:23 PM	5:28 PM	6:53 PM	7:53 PM	8:53 PM
		Dp	7:20 AM	8:55 AM	10:55 AM	12:25 PM	1:55 PM	3:25 PM	4:25 PM	5:30 PM	6:55 PM	7:55 PM	8:55 PM
Emeryville, CA	119	Ar	7:28 AM	9:03 AM	11:03 AM	12:33 PM	2:03 PM	3:33 PM	4:33 PM	5:38 PM	7:03 PM	8:03 PM	9:03 PM
		Dp	7:30 AM	9:05 AM	11:05 AM	12:35 PM	2:05 PM	3:35 PM	4:35 PM	5:40 PM	7:05 PM	8:05 PM	9:05 PM
Berkeley, CA	121	Dp	7:34 AM	9:09 AM	11:09 AM	12:39 PM	2:09 PM	3:39 PM	4:39 PM	5:44 PM	7:09 PM	8:09 PM	9:09 PM
Richmond, CA	127	Dp	7:42 AM	9:17 AM	11:17 AM	12:47 PM	2:17 PM	3:47 PM	4:47 PM	5:52 PM	7:17 PM	8:17 PM	9:17 PM
Martinez, CA	146	Dp	8:09 AM	9:44 AM	11:44 AM	1:14 PM	2:44 PM	4:14 PM	5:14 PM	6:19 PM	7:44 PM	8:44 PM	9:44 PM
Suisun-Fairfield, CA	164	Dp	8:28 AM	10:03 AM	12:03 PM	1:33 PM	3:03 PM	4:33 PM	5:33 PM	6:38 PM	8:03 PM	9:03 PM	10:03 PM
Fairfield-Vacaville, CA	168	Dp	8:34 AM	10:09 AM	12:09 PM	1:39 PM	3:09 PM	4:39 PM	5:39 PM	6:44 PM	8:09 PM	9:09 PM	10:09 PM
Davis, CA	190	Dp	8:52 AM	10:27 AM	12:27 PM	1:57 PM	3:27 PM	4:57 PM	5:57 PM	7:02 PM	8:27 PM	9:27 PM	10:27 PM
Sacramento, CA	204	Ar	9:18 AM	10:41 AM	12:41 PM	2:23 PM	3:41 PM	5:26 PM	6:11 PM	7:22 PM	8:41 PM	9:41 PM	10:58 PM
		Dp	Bus	10:44 AM	12:44 PM		3:44 PM		6:14 PM	7:25 PM	8:44 PM	9:44 PM	
Roseville, CA	221	Dp	RSV Bus	11:19 AM	1:19 PM		4:19 PM		6:49 PM	7:48 PM	9:19 PM	10:19 PM	
Rocklin, CA	225	Dp	RLN Bus		RLN Bus		RLN Bus			7:56 PM			
Auburn, CA	239	Ar	ARN Bus		ARN Bus		ARN Bus			8:33 PM			

2.8.3 Amtrak Long Distance Services

The four daily long distance Amtrak services connecting the Bay Area with destinations north to Seattle, south to Los Angeles (Trains 11/14, Coast Starlight) and east to Reno and Chicago (Trains 5/6 California Zephyr) do not currently serve Solano communities directly. The county is one of largest service areas (by population) on those routes without a station stop.

Ridership on these four trains with origins or destinations within Solano is not easily defined. The consultant however had access to recent Amtrak data and this includes passengers with origins and destinations on connecting with these services. The leisure market is a significant element of patronage on the services: their schedules and routings attract domestic and overseas visitors with less travel time sensitivity than intercity/commuter passengers on Capitol Corridor (scheduled timing has 12 hour travel time between the Bay Area and Los Angeles, for example). There is also much greater seasonal variation in ridership on Capitol Corridor service.

These services are less schedule-critical than Capitol Corridor, with significant recovery time built in to schedules along their route. There are additional service features of these trains that are not offered on Capitol Corridor: for example, checked baggage service (where stations are staffed) sleeper accommodations and full service dining.

No state model-based ridership forecast was available for these Amtrak routes making a stop in Solano. However, given the current consistent use of the Suisun-Fairfield as a station for seasonal privately run leisure trains to the Reno area, it is likely that some leisure passengers could be added to the current patronage which of these four trains from Solano. Since the stations would operate as a limited service unstaffed locations for the services - like other stations in Northern California such as Roseville and Chico little marginal cost is anticipated to make a regular stop in Solano.

Stops still must meet Amtrak's Station Program and Planning and design guidelines (updated mid-2013). Platform length could be an issue if the 1200' length required in the guidelines were adhered to, although many shorter platforms are grandfathered into such service stops. A stop for both services either at SUI or FFV in future could likely be accommodated in the schedule as an Amtrak Category 3/4 unstaffed "caretaker/shelter" station (with ridership in the 20 to 100,000 passengers annually, shared with existing commuter/intercity rail). Solano communities would need to assess the benefits of advocating for a stop.

In a positive development after the Plan Update was underway, Amtrak trains 11/14 are likely to receive an upgrade in the form of a new business class service onboard, likely to debut sometime during fiscal year 2016. For the first time, a dedicated business class product will be available and provide a potentially attractive direct option for business travelers. For some regional destinations to and from Solano, the service may provide a relatively time competitive option at certain times of the day that currently are not served by Capitol Corridor e.g. San Jose/Salinas in the am peak direction (although on-time performance may be an issue).

Together with the primary leisure markets served by these trains, the new business class product reinforces the value of these trains and the need to consider a stop at either Suisun or the new Fairfield-Vacaville station.

2.9 TRANSIT AND STATION CONNECTIVITY

2.9.1 Serving Intercity Rail Stations

The “first mile/last mile” issue associated with passenger rail can prove to be the most difficult one. That is, are the ways that a train rider gets to and from the station attractive enough to motivate them to use the system? And, if parking at the station is unconstrained or the land uses around the station are oriented toward auto access, will the rider ultimately choose his private auto as his or her first mile/last mile solution?

These are the issues that are being faced with the development of the future Fairfield-Vacaville (FFV station). While it is possible to provide transit to the station to address the first mile/last mile question, fixed-route transit service may be cost prohibitive unless it is designed to serve additional uses or as deviations from existing routes. Additionally, if parking remains available and plentiful at both the FFV and SUI stations, those with a choice will likely continue to drive unless the transit option is fast, reliable and reasonably priced.

In suburban areas, it is not uncommon for rail stations to be located in sparsely developed areas that are difficult to effectively or efficiently serve with fixed-route bus transit service. Often these areas undergo major land use changes over time; but, serving them prior to development is the challenge.

Does the transit operator initiate an attractive alternative to accessing the train station upon station opening, realizing that it may be inefficient and costly unless other land uses can support the service? Or, does the transit operator phase in fixed-route services over time as development patterns change? And, unless operating revenues for these services are directly tied to the station development, funds for service operation may be more effective in areas where development patterns render better ridership. These are the challenges facing rail station development and the bus operators serving the current Suisun-Fairfield and proposed Fairfield-Vacaville stations and any future stations.

2.9.2 Current Station Access

Currently, the Suisun-Fairfield station is served by two local Fairfield and Suisun Transit (FAST) routes that provide a connection to the station as well as to local route destinations in Fairfield and Suisun City: Route 5 operates on 30 minute frequency from 6am-7pm, and some Route 7 service is provided on school days. Additionally, SolanoExpress Route 90 connects the stations to destinations west, terminating at El Cerrito Del Norte BART.

Based on rider surveys conducted over the last several years, access to the Suisun-Fairfield station is predominantly by drive-alone vehicle. It represents the largest share of riders: 37% to 67% for both on/off activity. This is slightly lower than the countywide mode split estimates of 72%[5]. Another 14% to 30% of riders are dropped off or picked up at the station in private autos. Bus access to the Suisun-Fairfield station is currently between 2%-4% of the riders surveyed in July 2014. This is only slightly lower than the countywide multimodal split for transit (5%).

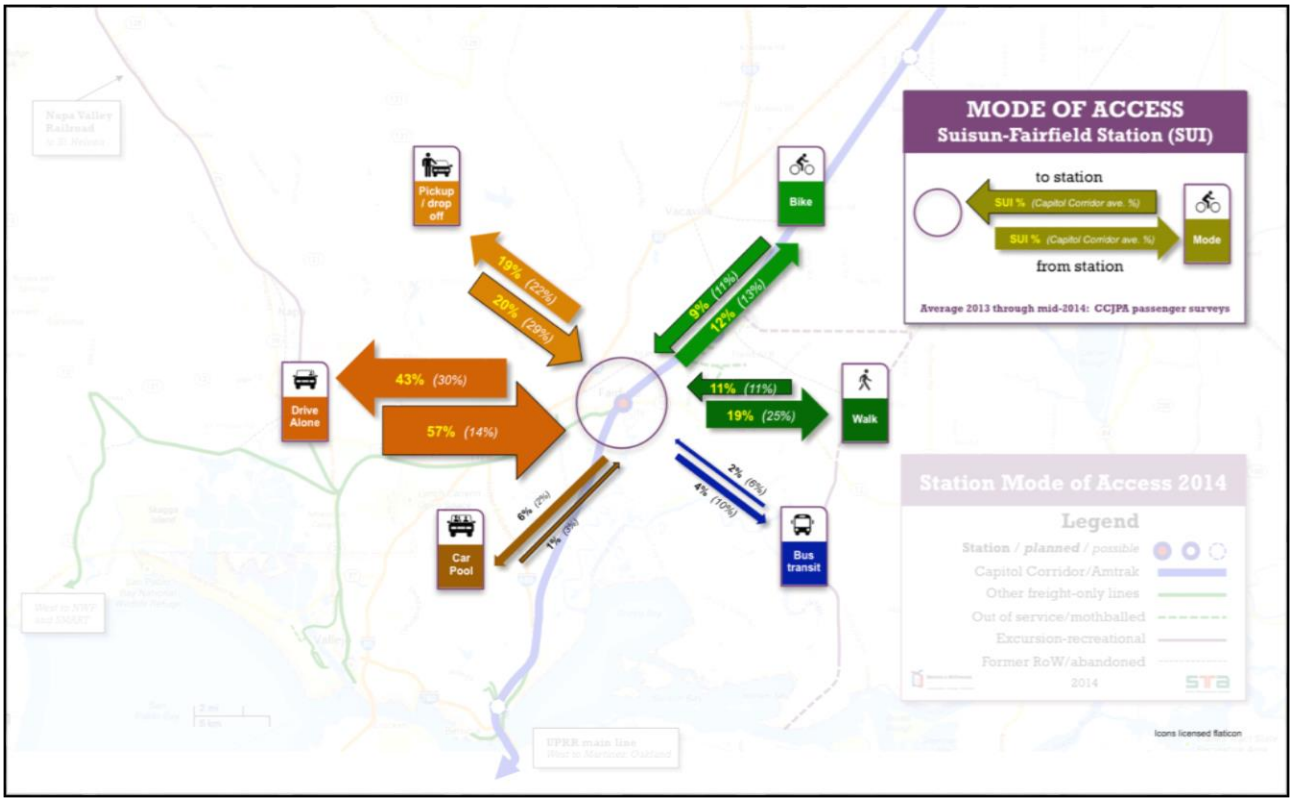
[5] Solano County Congestion Management Plan Dec. 2013 p. 42

However, bike access is significantly higher at this station than the county as a whole (7%-13% compared to 4% for the county). Walk access is almost three times higher than the countywide average (between 12% - 18% compared to 4% for the county). This is due to Suisun City's recent success in completing several bicycle and pedestrian access projects that connect the community to the station and downtown. Figure 17 presents the mode access for three years.

Figure 17 Mode of Access for Suisun-Fairfield Station (SUI)

Mode of access		Drive alone		Auto dropoff /		Carpool		Taxi		Bike		Walk		Bus transit	
		To train (ON)	From train (OFF)	To train (ON)	From train (OFF)	To train (ON)	From train (OFF)	To train (ON)	From train (OFF)	To train (ON)	From train (OFF)	To train (ON)	From train (OFF)	To train (ON)	From train (OFF)
Suisun-Fairfield, CA (SUI)	(Jan 2013)	*58%*	*46%*	*22%*	*13%*	*1%*	*7%*	*2%*	*0%*	*7%*	*11%*	*12%*	*20%*	*0%*	*5%*
	(Jul 2013)	*47%*	*46%*	*24%*	*13%*	*1%*	*8%*	*8%*		*13%*	*11%*	*8%*	*20%*	*2%*	*5%*
	(Jul 2014)	*67%*	*37%*	*14%*	*30%*	*2%*	*2%*	*3%*	*1%*	*7%*	*13%*	*12%*	*18%*	*4%*	*2%*

Source: CCJPA/Corey, Canapary & Galanis



2.9.3 Future 10-year Fairfield-Vacaville Station Connection Needs

Current train ridership at the Suisun-Fairfield station is approximately 200,000 boardings annually. Based on projections, it is assumed that additional system level boardings would be attributed to the new Fairfield-Vacaville station of between 86,000 and 190,000 annually. This increase, combined with existing rail ridership, includes approximately 900 to 1,300 total weekday boardings, and between 150 and 200 weekend boardings. These ridership figures assume that every train stops at both stations.

To support pedestrian and bike access, the Fairfield-Vacaville station is envisioned to have improvements that will assist in achieving mode split numbers that are already being achieved at the Suisun-Fairfield station (Fig.17). Additionally, it is anticipated that the parking supply at the FFV will be unconstrained with a 350 space near-term lot that is planned for expansion based on demand.

Fairfield and Vacaville have partnered together to support the FFV Intermodal Station. FAST staff is developing a plan for a new local bus route (Route 9) to serve the new transportation center. Currently in concept for possible implementation before the train station opens, the new route could start at the Intermodal Station, operate south along Walters Road serving anew Wal-Mart at Highway 12 and then travel west to the existing train station in Suisun City. The new Route 9 would connect to other local bus routes at Huntington transfer point (Routes 2 and 4), along Walters Road (Route 6), and at the Suisun-Fairfield Train Station (Route 5). The new Route 9, operating every 60 minutes Monday through Saturday, would add about 40,000 new riders and 4,000 vehicle revenue hours annually to the local bus system.

While the bus service could be initiated prior to the opening of the station, the full route cannot be contemplated before construction of the new Intermodal Station is complete. Additionally, operation of any new service is contingent upon additional operating funds and possibly the acquisition of two new buses if needed.

As shown in Figure 19, costs for this service would be approximately $400,000 per year in FY 2015-16, rising to approximately $500,000 per year in ten years. This annual operating cost does not include any increases to the ADA paratransit service costs, as the addition of Route 9 would not significantly expand FAST's geographic coverage. The operating cost does not include the cost of new buses. According to FAST's 2013 Short Range Transit Plan, FAST's existing local bus fleet "will likely be sufficient to support existing local services plus the planned local service expansion"[6] which includes Route 9.

In an attempt to determine other bus connectivity improvements that could be made at FFV, projections for bus ridership at the station in 2015 were developed assuming that every train operated to both SUI and FFV. Two bus ridership scenarios were modeled: bus ridership using the current mode share of 4% that is realized at the Suisun-Fairfield station; and bus ridership that doubles the current mode share to 8%. Figure 18 presents the weekday totals, which include an average annual and daily estimate using the Low and High projections.

[6] Short Range Transit Plan, Fairfield and Suisun Transit, August 20, 2013, p. 58.

Figure 18 2015 Bus Ridership Projections at FFV and SUI

RAIL RIDERSHIP (RANGE):

Solano Stations Ridership: 2024

SCENARIO 1: All Train Station Stops

STATION										Trains/headways		
		Monthly		*Daily*				Annual		Weekday		Weekends /Holidays
Ridership Range:		**Lower**	***Upper***	**Lower**	***Upper***	**Lower**	***Upper***	**Lower**	***Upper***	**Daily Total**	**Peak hrs (7:00-9:00)**	
				Weekday		***Weekend***						
	Mi									30 (15 R/t)	max 40 min h/w	22 (11r/t (h/w: n.a)
Suisun-Fairfield, CA (SUI)	**75**	10,200	17,200	**412**	**697**	**63**	**107**	121,800	*206,200*	30 (15 R/t)	max 40 min h/w	22 (11r/t (h/w: n.a)
Fairfield-Vacaville, CA (FFV)	**71**	12,100	15,600	**491**	**631**	**76**	**97**	145,300	*186,600*	30 (15 R/t)	max 40 min h/w	22 (11r/t (h/w: n.a)

BUS RIDERSHIP (RANGE):

	2025 Bus Ridership at Current Mode Share (4%)						**2025 Bus Ridership at Double Current Mode Share (8%)**					
Station	**Annual**		**Weekday**		**Weekend**		**Annual**		**Weekday**		**Weekend**	
	Low	***High***	***Low***	***High***	***Low***	***High***	***Low***	***High***	***Low***	***High***	***Low***	***High***
Suisun-Fairfield, CA (SUI)	*4,872*	*8,248*	*16*	*28*	*3*	*4*	*9,744*	*16,496*	*33*	*56*	*5*	*9*
Fairfield-Vacaville, CA (FFV)	4,720	7,440	16	25	2	8	9,440	14,880	32	50	5	8
Average (FFV)	6,638		23		5		13,276		45		7	

The analysis highlights potentially low transit ridership anticipated in 2025, even when doubling the mode share currently experienced at the SUI station.

The greatest challenge to initiating fixed-route bus service to serve rail stations located in sparsely populated areas is the anticipated daily ridership. Even when using a mode share of 8%—which is double the existing SUI station—service would only render 41 daily passengers in 2025. While the FAST Route 9 is intending on serving the station at completion if funds were made available, it is planned to operate in other corridors where ridership is anticipated such as the Wal-Mart and other areas along the route.

2.9.4 Financing And Implementation

2.9.4.1 Operating Costs: Connecting Transit Service

Figure 19 provides annual operating cost estimates for the connecting transportation services discussed in Section 2.9.

The key assumptions underlying these cost estimates are as follows:

- Hourly operating costs are based on the Solano County transit operators' 2013 Short Range Transit Plan financial projections, with 3 percent annual escalation for FY 2022-23 and FY 2023-24.
- The number of annual passenger trips was derived from the projected ridership for the new rail service and the current transit modal split at the Suisun-Fairfield station.

The costs per vehicle hour listed above are based on the agency's total operating costs. In some cases, the agency's marginal cost to add service to the rail stations may be less than the amounts shown above. However, we cannot accurately predict the marginal cost of future additional service at this time, as this calculation is dependent on the particular service profiles for each agency at the time of service delivery.

Specifics regarding providing connective transit service to the Fairfield/Vacaville Intermodal Station are recommended to be evaluated as part of FAST's Short Range Transit Plan (SRTP) update scheduled for 2015.

Figure 19 Annual Operating Cost Estimates for Connecting Transportation Services: SUI and FFV

Fixed Route Transit Service	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24
Route 9										
Annual Vehicle Revenue Hours	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
FAST Local Cost/Vehicle Hour	$ 96.14	$ 99.02	$ 101.99	$ 105.05	$ 108.20	$ 111.45	$ 114.79	$ 118.24	$ 121.79	$ 125.44
Estimated Annual Operating Cost	$ 384,560	$ 396,080	$ 407,960	$ 420,200	$ 432,800	$ 445,800	$ 459,160	$ 472,960	$ 487,149	$ 501,763

2.9.4.2 Capital Cost Potential Funding Sources

In order to undertake the full cost benefit analysis that would assist policymakers to make decisions on pursuit of projects, the improvements in this Plan Update would require both engineering validation and detailed rail operations modeling, both of which are outside the scope of this plan. There are relatively well-established sources for railroad infrastructure and passenger facility improvements.

A variety of local, regional, State and Federal funding sources may be available to fund the capital improvements included in this study. The following table summarizes the existing sources for which the different types of improvements may be eligible. The applicability of these funds to the recommended projects will depend upon numerous factors, including the local and regional funding priorities, as well as the timing of the project's construction and availability of the funding source.

In addition to the existing sources of funds, there may be opportunities to develop new funding streams for the longer-term projects. These may include a toll, a local sales tax measure and Cap and Trade funds.

Figure 20 provides a summary of these sources and their current availability.

Figure 20 Railroad Infrastructure Capital Improvements Potential Funding Sources

Source	Description	Comments
Passenger Rail Station Improvements		
California Transportation Development Act (TDA) / State Transit Assistance (STA)	Revenue generated by quarter-cent sales tax in each County (TDA) and sales tax on diesel fuel (STA). Funds are allocated by formula to transit operators for operating and capital uses.	
State Transportation Improvement Program (STIP) / Regional Transportation Improvement Program (RTIP)	The STIP is a multi-year capital improvement program of transportation projects on and off the State Highway System, funded with revenues from the State Highway Account and other funding sources. The STIP is composed of two sub-elements: the Regional Transportation Improvement Program (RTIP) (developed by MTC and County CMAs) and the Interregional Transportation Improvement Program (ITIP) (developed by Caltrans).	These funds are at historic lows and are generally fully programmed through the 5-year STIP horizon year.
California Cap and Trade: Transit and Intercity Rail Capital Program	The Transit and Intercity Rail Capital Program is a statewide competitive program to fund capital and operational improvements to modernize California's transit systems and reduce emissions of greenhouse gases. The California State Transportation Agency (CalSTA) is responsible for the overall administration of the program, including project evaluation and the development of a program of projects. MTC does not have a formal role with the program, but has provided guidance to focus the Bay Area's list of projects in line with adopted regional policy and funding commitments. MTC has indicated its preference to fund Core Capacity Challenge Grant projects in the initial funding cycle.	MTC has indicated support for future funding cycles to prioritize other large regional priority projects.

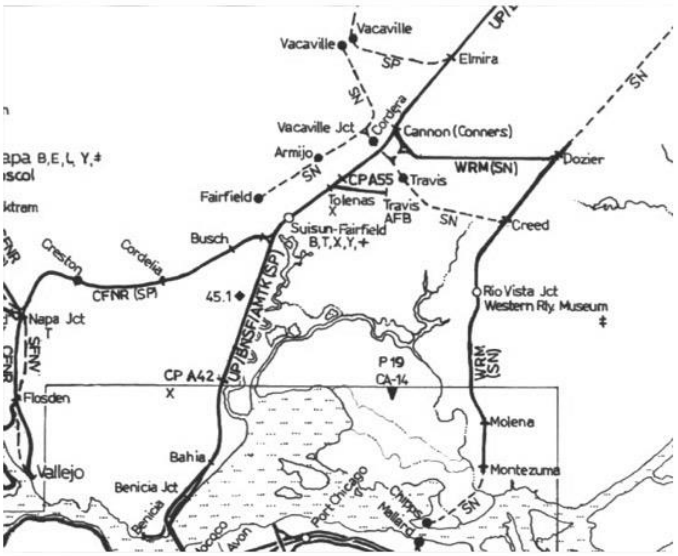
California Cap and Trade: Transit Operating and Efficiency Program	Funds are to be distributed by a formula that provides 40% to core capacity transit operators (AC Transit, BART, and SFMTA) and 60% to the remaining transit operators, based 50% on total ridership, 25% on low-income ridership and 25% on minority ridership. Funding is subject to each operator submitting qualifying projects for funding through a competitive selection process.	
California Active Transportation Program (ATP)	In September 2013, Governor Brown signed Senate Bill 99 and Assembly Bill 101 into law, creating the Active Transportation Program (ATP). The ATP consolidated federal and state funding sources including the Bicycle Transportation Account and Transportation Alternatives Program, into one program. It is anticipated that $125 million will be available annually for projects that promote active transportation. 60% of the revenues will be managed by the state (including the 10% for small urban and rural area competitive program) and 40% is administered by MTC.	Bike and/or pedestrian related improvements to or adjacent to the stations may be eligible for ATP funding. Pedestrian grade separation projects may also be eligible.
Regional OneBayArea Grant Program (OBAG)	MTC's OBAG Program was developed to address California's climate law. The program integrates multiple funding sources under one allocation approach. Each county CMA may program OBAG funds to projects that meet the eligibility requirements of any one of the following seven transportation improvement categories: Local Streets and Roads Preservation, Bicycle and Pedestrian Improvements, Transportation for Livable Communities, Safe Routes to School, Priority Conservation Areas, Regional Planning, and Bus and Rail Transit Rehabilitation. Rewards counties that plan for and produce affordable housing. MTC receives federal funding for local programming under the OBAG program through the State from federal surface transportation legislation. This includes Surface Transportation Program (STP), Congestion Mitigation and Air Quality Improvement (CMAQ) and Transportation Alternatives (TA) Program funds. Other funding sources include Cap and Trade, Regional Transportation Improvement Program (RTIP), and Transportation Fund for Clean Air (TFCA) funding.	

Regional Bridge Tolls	Revenue generated from tolls on Bay Area bridges funds capital and operating projects that mitigate and relieve traffic congestion on the bridges.	
Solano Regional Transportation Impact Fees (RTIF)	RTIF is a multi-jurisdiction fee intended to cover a portion of the costs for new transportation facilities required to serve new development within the County. Solano County began collecting the RTIF on February 3, 2014. Based on the RTIF Expenditure Plan developed by the STA, a total of 5% of the total RTIF revenue is to be dedicated towards transit projects under Package 6- Express Bus Transit Centers and Train Stations and 5% is dedicated to Unincorporated County Roads under Package 7. The remaining balance of the RTIF (90%) will be returned to each RTIF District from which it was generated.	
Grade Crossing Improvements		
California Grade Separation Program (Section 190)	The Section 190 Grade Separation Program is authorized by Section 190 of the Streets and Highways Code. This competitive grant program provides $15 million each year to local agencies for the construction of grade separation projects. The program is jointly administered by the California Public Utilities Commission (CPUC) and the California Department of Transportation (Caltrans). Local agencies submit project applications to the CPUC. The CPUC develops a priority list of projects. Projects must be on the priority list to receive funding.	Proposition 1B's Highway-Railroad Crossing Safety Account (HRCSA) included $250 million additional funding for the Section 190 grade separation program. As of June 2013, approximately $37 million had not yet been appropriated.

Federal Highway-Rail Grade Crossing Program (Section 130)	Under the Section 130 program, $220 million in annual funding is set-aside from the Highway Safety Improvement Program (HSIP) apportionment for the Highway-Rail Grade Crossing Program. The program provides funds for the elimination of hazards at railway-highway crossings. The funds are apportioned to States by formula. The Section 130 program funds are eligible for projects at all public crossings including roadways, bike trails and pedestrian paths. Fifty percent of a State's apportionment is dedicated for the installation of protective devices at crossings. The remainder of the funds apportionment can be used for any hazard elimination project, including protective devices.	Caltrans administers Section 130 funds. Projects must be on the California Public Utilities Commission (CPUC) Section 130 priority list to be eligible for funding under this program.
Federal Railroad Administration (FRA) Railroad Development Grant Opportunities	Notices of Funding Availability (NOFA) issued periodically to fund various FRA project focus areas. FY14 NOFA issued for intercity passenger rail grade crossing improvement projects, Positive Train Control (PTC) implementation projects, and Passenger Rail Corridor Investment Plan (PRCIP) projects, both state and multistate FRA-led corridor planning for passenger rail networks.	FY14 NOFA based on FY14 appropriation and unspent balances from other programs. Focused on smaller projects – although no formal cap, federal guidance in FY 14 suggests projects proposed under $3 million dollars.
Rail Infrastructure Capacity Enhancements		
California Cap and Trade: Goods Movement	Goods movement investments fall into two categories: (1) projects focused on improving the efficiency of the movement of goods within and through the region, and (2) mitigation projects that reduce the associated environmental impacts on local communities.	
Federal Railroad Rehabilitation & Improvement Financing Program (RRIF)	The RRIF program provides direct loans and loan guarantees to finance development of railroad infrastructure. The funding may be used to: • Acquire, improve, or rehabilitate intermodal or rail equipment or facilities, including track, components of track, bridges, yards, buildings and shops; • Refinance outstanding debt incurred for the purposes listed above; and • Develop or establish new intermodal or railroad facilities. Direct loans can fund up to 100% of a railroad project with repayment periods of up to 35 years and interest rates equal to the cost of borrowing to the government.	Eligible borrowers include railroads, state and local governments, government-sponsored authorities and corporations, joint ventures that include at least one railroad, and limited option freight shippers who intend to construct a new rail connection.

Federal Railroad Administration (FRA) Capital Assistance to States - Intercity Passenger Rail Service project grants	Financial assistance to fund capital improvements (and related planning activities) necessary to support improved or new intercity passenger rail service	Assistance to states (therefore would be channeled through state division of rail) can be used to develop projects, programs and planning, including Intercity Passenger Rail service, and will provide tangible and measurable benefits, such as on-time performance improvements, travel-time reductions and higher service frequencies resulting in increased ridership. Planning work for the Suisun-Fairfield island platform and track improvements project could potentially fit this program (focused on time performance and travel time benefits). However, obligations are relatively small annually - $3.2 million FY 13, $11 million in FY 14 and anticipated $6.2 million in FY 15.
Federal Transportation Infrastructure Finance and Innovation Act (TIFIA)	The TIFIA program provides credit assistance for qualified projects of regional and national significance. Eligible applicants include state and local governments, transit agencies, railroad companies, special authorities, special districts, and private entities. The TIFIA credit program is designed to fill market gaps and leverage substantial private co-investment by providing supplemental and subordinate capital. The TIFIA credit program offers three distinct types of financial assistance: **s**ecured (direct) loans, loan guarantees, and standby letters of credit.	Major requirements include a capital cost of at least $50 million (or 33.3 percent of a state's annual apportionment of Federal-aid funds, whichever is less) or $15 million in the case of ITS. TIFIA credit assistance is limited to a maximum of 33 percent of the total eligible project costs. Senior debt must be rated investment grade. The project also must be supported in whole or in part from user charges or other non-Federal dedicated funding sources and be included in the state's transportation plan.

Solano Rail Facilities Plan Update



Chapter 3

REPORT ON RAIL INFRASTRUCTURE AND SAFETY

3 REPORT ON RAIL INFRASTRUCTURE AND SAFETY

3.1 THROUGHPUT, CAPACITY, AND FUTURE NEEDS

3.1.1 Current Needs

In general, the capacity for freight trains (absent other traffic) in Solano County is adequate. However, to allow increased passenger service, to improve passenger train reliability, or to decrease passenger train travel times, infrastructure improvements would be necessary. The identification of specific improvements and the resulting benefits is a negotiated process between the passenger operators (i.e., CCJPA and Amtrak) and the host freight railroad (in this case, Union Pacific). The following discussion addresses the nature of capacity constraints and several conceptual improvements.

Most main line trackage in Solano County is suitable for relatively high speeds, on the order of 79 miles per hour (mph) for passenger trains and 60-70 mph for freight trains. In order to maximize throughput, the areas where trains slow down are thus the most likely candidates for capacity improvements. In these areas, all train – both freight and passenger – must reduce speeds if the train ahead slows or stops. Because of the federal requirements for the way railroad signal systems are configured, trains following one another must be spaced very far apart, and thus when a train slows down, the effects ripple through the system. This is compounded by the fact that trains require long distances to slow down and to accelerate.

It is important to note that although potential funding sources were identified in chapter 2, none are proposed for the throughput and capacity projects identified below. In addition, the total time savings for passenger rail service, and therefore impact on passenger rail ridership, have not been modeled using the standard statewide rail model. This precludes the development of full cost to benefit analysis that would help inform decision makers whether or not they should pursue these projects.

3.1.2 Potential Projects – Near Term Horizon

To maintain existing passenger train frequencies, little additional infrastructure is necessary. However, there are infrastructure improvements that could improve reliability. The near term horizon refers to projects which could be completed – or could have a sufficient portion of the work accomplished – within approximately 10 years.

One key area for delays is in the Suisun Marsh between Cordelia Road and Benicia. This area is subject to unstable ground and flooding. The unstable ground can cause “dips” in the track, at which trains must slow down, while flooding presents obvious obstacles to train movements, as well as expensive repairs. Potential improvements in this area include subgrade/ground improvements to reduce raising the track above the level of flooding.

The nature of ground improvements would need to be determined by geotechnical studies, but may include reinforcing and widening embankments with rocks, or possibly stabilizing soils with soil cement or lime injections. These approaches could require environmental analysis.

Raising the track would require widening the embankment, as well as modifications to existing bridges. Like subgrade improvements, such efforts would require environmental permitting. If the embankment were raised and widened, an access road should be added in order to allow

maintenance access with road vehicles, rather than from rail-mounted maintenance vehicles (the rail mounted vehicles consume capacity just as a slow or stopped train does).

Another project, which would result in significant reliability improvements, would be to reconfigure the narrow center platform at Suisun City station to match the configuration of the new Fairfield-Vacaville station. When trains stop at the narrow center platform at Suisun City, train traffic on the track between the center platform and the station is halted. This impacts capacity. The solution is a center platform with grade separated access.

Likewise, at Suisun City, some freight switching occurs along the main line; this could be moved off the main line by extending the freight tracks, or adding a freight bypass, possibly extending as far as the proposed freight bypass at the new Fairfield-Vacaville station.

To plan for future capacity expansion in conjunction with a larger suite of projects, a third main track may be necessary through parts of Solano County. Although this is likely beyond the 10-year horizon, early steps that can be taken to facilitate this would be to establish conceptual footprints and to acquire wetland mitigation credits ahead of time.

Near Benicia, three projects could improve reliability. The first would be to add a second track underneath the Suisun Bay Bridge, around the narrow spit of land, parallel to the road that leads to the AmPORTS facility. The second would be to add a siding off the main line (near the Sulphur Springs viaduct). The third would be to connect the existing Benicia siding to the Benicia Industrial Park.

By adding a second track under the Suisun Bay Bridge, a new, long track on which trains could arrive or depart from the main line without having to wait for switching operations to clear the existing single track would be created. This could also reduce the amount of time trains use the main line for switching trains between the Benicia Siding and the Industrial Park.

By adding a siding along the main line near the viaduct, additional capacity would be available for trains waiting when the bridge is raised, and it would offer dispatchers more flexibility to stage and sort trains if multiple trains were waiting when the bridge was raised.

By connecting the existing Benicia siding to the Benicia Industrial Park switching area, the number of trips switch engines would make on the mainline (to access cars stored on the siding) would be reduced.

Lastly, Solano County offers one of the longest stretches of straight track along the entire route between Sacramento and Oakland in the area between Vacaville and Dixon. Moreover, this section of track is in an area that appears to have relatively few environmental challenges. As such, there is an opportunity to construct a third track in this area: this 3rd track could increase overall capacity, and also serve as a place to “sort” higher speed trains from slower-speed trains without forcing any trains to stop. The actual benefits from this project would need to be identified: there is not an easy way to establish an exact performance improvement without analyzing a much larger portion of the railroad and talking with UPRR and CCJPA.

3.1.3 Potential Projects – Long Term Horizon

There are several key projects that would likely occur over a longer term (i.e., greater than 10 years) horizon. Several of these also involve cooperation with adjacent counties, since they are large enough to span multiple jurisdictions.

The first among the long-term projects would be realignment of the curve at Davis, which, although outside of Solano County, may require realignment of the tracks reaching into Solano County. This

could also be part of a project to upgrade the station and eliminate the existing narrow center platform, as well as projects to improve roadway connectivity across the railroad right of way with new bridges or tunnels.

Another major project would be replacement or upgrade of the Suisun Bay Bridge, half of which is located in Solano County. The bridge is a key constraint, since it opens on a schedule not controlled or generally known in advance by the rail operators to allow ship traffic to pass. During this time, all rail traffic is halted. Replacement of this bridge would be a major project, likely costing hundreds of millions of dollars.

Many of the projects identified as "near term projects" could also be expanded, or developed in a phased basis, such that they extend beyond the 10-year threshold. Examples include the ground improvements or track raises in the Suisun Marsh: for these projects, preliminary engineering and permitting could occur along with initial construction activities on the most critical sections, in the 10-year horizon, while full completion could linger beyond 10 years (or as funds are available).

CCJPA is also developing a long-term "Vision Plan" to guide long-term infrastructure investment in the corridor between Oakland and Sacramento/Roseville. This plan may evaluate at higher speeds or even dedicated passenger tracks. As details of this plan are developed, they can supplement the information herein.

3.1.4 Project Priorities

The following list identifies a possible prioritization strategy for near-term projects. Further discussion and confirmation of these priorities should occur in conjunction with the CCJPA and Union Pacific Railroad. Note that conceptual costs are not based upon any preliminary engineering; they are based on similar projects and the team's knowledge of the area.

1. Establish center platform at Suisun City and construct freight-switching track (preliminary engineering to develop an estimate, funding identification. and permitting could occur immediately; if funding were available, construction could commence within 10 years). Order of magnitude costs would be approximately $20-$40 million.
2. Suisun Marsh ground improvements, embankment widening (preliminary engineering and permitting could begin immediately; initial construction could begin as soon as funds were available and yield immediate results by remediating the least stable sections). Conceptual costs could be on the order of $15-$50 million.
3. Benicia improvements to reduce switching on the main line and allow additional dispatching flexibility (some of these projects could be designed, permitted, and completed within 10 years). Order of magnitude costs would be approximately $10-$25 million.
4. Solano County third main track. The benefits of this project would need to be confirmed. Order of magnitude costs would be approximately $40-$60 million.

Note that many of the safety improvement projects listed in the following section could also be undertaken in the 10-year time frame.

Prioritization of long-term projects is more challenging, since they involve entities and agencies outside Solano County and the priorities amongst agencies must align in order to progress these efforts.

1. The Davis curve realignment, extending into Solano County, would be a project yielding large benefits, but at high costs and being possibly disruptive to the City of Davis. In the absence of an engineering study, costs are difficult to estimate, since there are multiple alternatives, each of which would have distinctly different cost structure. It is conceivable that the order of magnitude cost could be up to $100 million.
2. The Suisun Bay Bridge upgrades to reduce bridge delays would be extremely expensive. Without understanding the various alternatives and the goals of each alternative, it is not advisable to provide order of magnitude costs.

3.2 SAFETY

3.2.1 Key Safety Findings of Previous Studies

Two studies were used to analyze previous safety concerns at rail crossings in Solano County: (1) 2003 Napa/Solano Passenger/Freight Rail Study Final Report which was prepared for the Solano Transportation Authority and the Napa County Transportation Planning Agency and (2) 2011 Final Rail Crossing Inventory and Improvement Plan which was prepared for the Solano Transportation Authority and the Capital Corridor Joint Powers Authority.

The 2003 Napa/Solano Passenger/Freight Rail Study Final Report concentrated on the required improvements to develop passenger rail transportation on several of the existing lines in Napa and Solano Counties. The report covers all elements of a comprehensive new-start public rail transportation plan, route and equipment selection, station characteristics, capital improvement costs, potential passenger and freight improvements, and environmental impacts. In terms of safety, the report covered the conditions of the current at-grade crossings, and potential improvements along four of the existing mainlines throughout Napa and Solano Counties (primarily Napa County).

The 2003 existing rail study area in Solano County consisted of the Vallejo Branch on the Martinez Subdivision rail line running from Mare Island towards the Napa Junction and the Schellville Branch on the Martinez Subdivision running out of the Napa Junction towards Suisun City/Fairfield through American Canyon. These two branches run in both Napa and Solano Counties, but 70% of the total track (roughly 20 miles) runs through Solano County. The tracks along these two branches were reported as having poor track conditions due to low track speeds, which allow the line to operate under Federal Railroad Administration (FRA) Class II Track Standards.

The upgrade to FRA Class III Standards, required for the proposed commuter rail service, would require the entire track structure including rail, ties, and ballast to be replaced along with turnouts and at-grade crossings along the line. It was also recommended that a signal system be installed for passenger rail to provide further safety improvements. In terms of crossings, the structures along the route were found to be in relatively good condition and would only need minor repairs to bring to the standard needed for passenger rail. One bridge was found to be in need of replacement (the Napa River bridge) and scheduled for replacement as part of an Army Corps of Engineers / flood control project. 35 Private and public at-grade crossings exist for the study area in Solano County. These crossings were determined to all need replacement of crossing surfaces, an upgrade (extending) of warning circuits for the higher commuter train speeds, and replacement of old and outdated crossing equipment.

The 2011 Final Rail Crossing Inventory and Improvement Plan concentrated on providing an inventory of all rail crossings in Solano County, identifying and listing which of those crossings are considered a priority due to impacts on vehicle and pedestrian safety and recommending improvements to increase safety. As part of the study, 221 crossings were identified throughout the county. Of these crossings 107 had Department of Transportation (DOT) Grade Crossings Inventory numbers, 50 were unidentified public crossings, 17 were unidentified private crossings, and 47 were non-road crossings (drainages, creeks, and pipelines). There were also 15 grade separated crossings, 5 pedestrian-only crossings, 39 crossings where there is no vehicular traffic (excluding pedestrian only and grade separated), and 15 crossings that currently have no railroad service, which left roughly 147 open at-grade crossings in the County of Solano. The report also listed accident data for all the crossings from Jan 1, 2000. 26 accidents were reported in this period, 5 of which had injuries and 10 of which had fatalities.

Using the data listed above, the report then listed 5 areas of concern and potential mitigations:

- The first area was the City of Dixon downtown, from North 1st Street/SR 113 to A Street where an underground pedestrian crossing was proposed to replace the B-street pedestrian crossing and a grade separation was proposed for A Street. The West B Street pedestrian under crossing was completed by STA and the City of Dixon in 2014.
- The second area was the Peabody Road crossing in the City of Fairfield, which has the highest peak traffic volume of all the crossings in the county with 5,600 peak hour trips. There is a plan to build a new grade-separation as part of the future Jepson Parkway Project that will take traffic off of Peabody road, also the Fairfield-Vacaville train station will include building a grade-separated crossing of Peabody road to carry both auto and bicycle/pedestrian traffic.
- The third area was City of Fairfield and City of Suisun City, from East Tabor Avenue to the SR 12 Overcrossing, where a pedestrian crossing is recommended at Blossom Drive.
- The fourth was the City of Vallejo, along Broadway Street north of Sereno Drive, which is in an area that may be developed. Improvements that may impact the rail crossing in that area will need to be monitored.
- The fifth was other locations of concern based on high levels of traffic congestion which included North 1st St in Dixon, East Tabor Ave in Fairfield, Sunset Avenue in Suisun City, and North Gate Road in the unincorporated county. The fifth area also included areas of concern if traffic were to increase in the coming years in Vallejo, which included Mini Drive, Tennessee Street, Solano Avenue, Curtola Parkway, 5th Street, Sonoma Blvd., Wilson Avenue, the Mare Island Causeway, and Railroad Avenue on Mare Island.

Both studies provide in-depth information regarding the existing track, structures, and at-grade crossings in the County of Solano.

3.2.2 Updated and Prioritized Safety Projects

To update the prioritized safety projects for the County of Solano, consultant team members RailPros started by doing an inventory of all crossings throughout the County of Solano. Using the 2003 Napa/Solano Passenger/ Freight Rail Study Final Report, the 2011 Final Rail Crossing Inventory, and current California Public Utility Commission (CPUC) Rail Crossing List, an updated list of public crossings for the County of Solano was developed. Inventory reports and Accident Data from the FRA database were gathered and relevant data was used to help prioritize the crossings. Much of the traffic data shown in the 2011 Final Rail Crossing Summary was outdated, so current traffic data was requested from the cities of Fairfield, Vacaville, Suisun City, and Vallejo, and the County of Solano. All inventories of equipment were verified as well and some additional crossing information was provided by the roadway authorities.

From this data, it was determined that crossings along the Montezuma and Vacaville Branches on the Feather River Subdivision operating in the County under the Western Railway Museum, which runs exhibition lines at most 4 times a day and a maximum speed of 20 mph, could be eliminated as priority crossings due to low rail volumes and train speeds. It was also determined that crossings operated by California Northern (CN) mainly in Vallejo were not considered priority as the

current train traffic along the line is only upwards of 10 trains per day and a maximum speed of 25 mph. These crossings, however, have potential to become high priority if the rail traffic increases, which is a possibility and should therefore be monitored and reevaluated if the traffic on these lines does increase. It was also determined that crossings with no accidents would not be included as a priority crossing.

Figure 21 lists 23 crossings that met the established priority criteria. Most of these crossings are located along the UPRR Mainline that runs NE-SW through the County. The remaining crossings are along the line from the old General Mills waterfront property, as this line has been identified as having potential for freight growth in the near future and should therefore be monitored closely.

To further prioritize the crossings, accident data, including year and type, traffic volumes, train volumes, and train speed were taken into account. Other specific data, such as pedestrian use and recent improvements as well as other concerns that are not normally tracked were considered based on information provided by the cities (and County, for unincorporated areas) that had jurisdiction over the crossings. Several crossings were high priority, but were not made a priority on this list as they are receiving or have recently received improvements. These crossings include Peabody Road and Sunset Avenue. Based on the analysis, the following 7 crossings are considered highest priority for future improvements. They are, from northeast to southwest: Pedrick Road in Dixon, 1st Street in Dixon, A Street in Dixon, Fry Road in Vacaville, Canon Road in Fairfield, and E. Tabor Avenue in Fairfield. The crossings are listed below from highest priority to lowest.

A. E. Tabor Avenue, Fairfield, CA

E. Tabor Avenue is a crossing with higher than average auto traffic, high train traffic and high train speeds. The crossing had many issues with autos driving around gates in the past, and had medians installed, which have mitigated that issue. Based on recent discussions with the City, there are current issues with students crossing the tracks to get to and from a middle and elementary school. The school district currently provides a crossing guard to assist the students traverse the crossing and stay clear of the motorist right of way, but no sidewalk or other pedestrian improvements have been implemented. It is recommended that sidewalks be extended to the crossing to allow students to safely move over the grade crossing. This basic improvement proposed would cost roughly $60,000.

This project is also identified in the STA's Safe Routes to School plan, with a wider range of sidewalk, grade crossing, bus stop and street improvements connecting to the schools, at a higher project cost ($600,000-$1 million).

B. 1st Street, Dixon, CA

1st Street is a skewed crossing with high auto traffic and moderate train volume where 2 of the 3 accidents that have occurred since 1976 have involved pedestrians. The grade crossing separates a nearby school from a mainly residential area and a school crossing exists just south of the crossing. 1st street grade crossing currently has no sidewalk or pedestrian improvements, which would be recommended at this crossing based on accident data and the speed of trains (70 mph) as they move over the crossing. To install the necessary mitigations would cost roughly $20,000.

C. Canon Road, Fairfield, CA

Canon Road is a crossing with high train traffic, high train speeds, moderate auto traffic and a short storage space. The adjacent 3-way intersection is stop controlled with roughly 40 feet of storage space. 4 of the 5 accidents that happened at this crossing since 1976 have involved vehicles stopped on the crossing. This crossing would be a candidate for either a pre-signal or at the very least, short storage signage to help prevent users from stopping on the tracks. To install a presignal and upgrade the intersection to be a signalized intersection would cost roughly $200,000. Short storage signage would cost roughly $500. Any increases to the railroad signal timing would be at an additional cost. This crossing is planned for elimination with the realignment of Canon Road as part of the implementation of the Fairfield Train Station Specific Plan.

D. Midway Road, Unincorporated County of Solano, CA

Midway Road crossing is a low auto traffic crossing with high speed and moderate levels of train traffic. It is also the crossing with the most recent accident (2014). The adjacent 3-way intersection is stop controlled in the west and north directions with roughly 100 feet of storage space that is on a curve. Of the 3 accidents that occurred, 2 involved vehicles stopped on the tracks. It is therefore recommended that a pre-signal, or at the very least short storage signage, be installed at the crossing. To install a presignal and upgrade the intersection to be a signalized intersection would cost roughly $150,000. Short storage signage would cost roughly $500. Any increases to the RR signal timing would be at an additional cost.

E. Fry Road, Vacaville, CA

Fry Road crossing is a low volume but high-speed auto traffic crossing with high-speed train traffic and moderate rail traffic. All 3 of the accidents at this crossing have been because of vehicle drive-arounds. It is therefore recommended that medians be installed at the crossing to help prevent vehicles driving around gates. Installing medians at this crossing would cost roughly $20,000.

F. A Street, Dixon, CA

A Street has been a crossing of concern since the 2011 Final Rail Crossing Inventory was written. While there are few recent accidents at the crossing, eastbound queuing is a significant issue and traffic counts are high enough that it is a good candidate for a queue cutter traffic signal. A Street has also been a candidate for a grade separation per the 2011 Final Rail Crossing Inventory. While a grade crossing would eliminate the queuing issue, until the grade separation is complete, queuing will still be an issue. The crossing may also be impacted such that the crossing will have lower peak traffic levels and therefore less queuing once the Parkway Boulevard Grade Separation is complete. Therefore, it is recommended that a queue cutter be installed until a grade separation is implemented. To install a queue cutter would cost roughly $150,000. Any increases to the RR signal timing would be at an additional cost.

G. Pedrick Road, Dixon, CA

Pedrick Road Crossing is a crossing that is recommended for monitoring. It is a skewed crossing with moderate daily auto traffic and fairly low train volume. It is used primarily by locals as a side street and is used heavily by trucks during the harvest months, which makes for a large seasonal peak in traffic that is not necessarily shown in the average daily

traffic (ADT) counts. Because of this, it is recommended that more current traffic data be determined including vehicle mix. The crossing has had past issues with drive-arounds and currently has no medians. If peak traffic levels and vehicle usage show that this crossing is a high risk crossing, the crossing should be reevaluated for further improvements, including the installation of medians.

H. Pierce Lane, Unincorporated County of Solano, CA

Pierce Lane Crossing is a crossing that is recommended for monitoring. Although there has only been one accident at the crossing in 2007, the accident involved a truck getting stuck on the crossing. The consultants were unable to get updated traffic counts for this crossing and the latest counts from 1988 show 200 vehicles using this crossing. The crossing has a significant hump and leads into a boat yard. The roadway approaching the crossing is posted with "flooded" signage with adjacent water levels close to the road elevation. It would be good to have more current traffic data, including vehicle mix. If trucks are regular crossing users, additional signage should be installed to warn motorists of the geometric constraints.

These recommendations are based on the most current data available and are subject to change based on changes in traffic that may come into effect due to the current Peabody Road grade separation, the future Parkway Boulevard grade crossing, and if freight rail increases are implemented along the line operated by CFNR leading to the old General Mills waterfront property.

Figure 21 (four pages): Solano County Railroad Public Grade Crossings Prioritization Summary

Solano County Railroad Public Grade Crossings Prioritization Summary[1]

(Crossings listed from North to South)

Crossing Number	Road Name	City	Total Accidents	Accident Date(s)	Most Recent Accident	ADT (year)	Trains per day	Train Speed (mph)	Owner	Recent Improvements	Notes	2015 Priority Ranking
751241L	Old Davis Road	Unincorporated County	2	2001 1978	Truck drove around/thru gate	462 (2003)	18	70	UPRR	-	Skewed crossing, no median.	-
751246V	Tremont Road	Unincorporated County	1	2005	Truck-Trailor drove around/thru gate	3121 (2000)	18	70	UPRR	-	Skewed crossing, no median.	-
751248J	**Pedrick Road**	**Dixon, CA**	**2**	**1987 1976**	**Car drove around/thru gate**	**3146 (2008) w/ seasonal peak**	**18**	**70**	**UPRR**	**-**	**Skewed crossing. Used primarily by locals as a side street with considerably more use during harvest seasons (June to October). No median.**	**F**
751250K	**First Street**	**Dixon, CA**	**3**	**2009 2001 1980**	**Pedestrian struck while on crossing**	**14247 (2007)**	**18**	**70**	**UPRR**	**Section 130 Nominated**	**Skewed Crossing. Sidewalk not continuous on either side of the street at crossing. School Zone nearby.**	**B**
751253F	**A Street**	**Dixon, CA**	**2**	**1990 1982**	**Pedestrian struck while stopped on tracks**	**5227 (2008)**	**18**	**70**	**UPRR**	**-**	**Signalized intersection 650' east (1st Street) and 325' west of crossing (Adams St). AM Peak Hour EB Queuing from 1st Street intersection to the crossing. Traffic expected to be reduced by 25% with completion of Parkway Boulevard Grade Separation Project in 2 years. City reported significant increase in traffic in last 5 years.**	**G**
751254M	Pitt School Road	Dixon, CA	3	2005 1980 1980	Abandonded car stopped on crossing was struck.	400 (2009)	18	70	UPRR	-	2-way stop controlled adjacent intersection. Short storage space for NB traffic. Traffic expected to decrease after completion of Parkway Boulevard Grade Separation Project (2 years). Note: 10 years since last accident and 400 ADT.	

[1]Crossings with no accident history (per FRA database) and crossings from the Western Railway Museum have been omitted from this summary
All Active Crossings

Solano County Railroad Public Grade Crossings Prioritization Summary[1]

(Crossings listed from North to South)

Crossing Number	Road Name	City	Total Accidents	Accident Date(s)	Most Recent Accident	ADT (year)	Trains per day	Train Speed (mph)	Owner	Recent Improvements	Notes	2015 Priority Ranking
751255U	**Midway Road**	**Unincorporated County**	**3**	**2014 2007 1992**	**Unoccupied car was struck.**	**2082 (2014)**	**18**	**70**	**UPRR**	**-**	**WB traffic Stop controlled 100' west of crossing. Possible queuing issues (past accidents have been vehicles stopped on tracks). Queuing expected to be reduced after completion of Parkway Boulevard Grade Separation Project (3 years).**	**D**
751256B	Batavia Road	Unincorporated County	1	1998	Car did not stop at crossing	200 (1988)	18	70	UPRR	-	Skewed Crossing	
751259W	Lewis Road	Unincorporated County	1	1988	Vehicle drove around gates	400 (1988)	18	70	UPRR	-	Skewed Crossing	
751260R	Hawkins Road	Unincorporated County	1	1977	Car stalled on crossing.	200 (1988)	18	70	UPRR	-	Skewed Crossing	
751288G	Elmira Road	Elmira, CA	1	2013	Unoccupied car struck. Car was stuck on crossing and driver abandoned car.	1270 (2012)	18	70	UPRR	-	California Pacific Road 40' to the west (CA Pacific Rd Stop Controlled) and A Street Crossing 200' to the east (4-way stop).	-
751289N	**Fry Road**	**Vacaville, CA**	**3**	**2008 2004 1993**	**Train was struck by truck that drove around/thru gate**	**2950 (2011)**	**18**	**60**	**UPRR**	**-**	**All accidents have involved vehicles going around gates.**	**E**
751291P	**Canon Road**	**Fairfield, CA**	**5**	**2011 2007 2002 2001 1992**	**Tractor-Trailer fouling the crossing was struck while stopped at crossing.**	**4472 (2013)**	**43**	**60**	**UPRR**	**-**	**Short staged crossing, with 40' of clear storage distance between tracks and intersection limit line. Crossing used by trucks that foul track when stopped at limit line.**	**C**
751292W	Peabody Road	Fairfield, CA	6	2014 2000 1990 1986 1986 1976	Train struck car that drove around/thru gate	21684 (2013)	41	60	UPRR	Grade Separation (Planned 2016 Completion)	Grade separation underway. School crossing 500 ft south of crossing for housing development north of crossing (about 2 miles away from school). Highest ADT of studied crossings.	-

[1]Crossings with no accident history (per FRA database) and crossings from the Western Railway Museum have been omitted from this summary
All Active Crossings

Solano County Railroad Public Grade Crossings Prioritization Summary[1]

(Crossings listed from North to South)

Crossing Number	Road Name	City	Total Accidents	Accident Date(s)	Most Recent Accident	ADT (year)	Trains per day	Train Speed (mph)	Owner	Recent Improvements	Notes	2015 Priority Ranking
751294K	**E Tabor Avenue**	**Fairfield, CA**	**7**	**2010 2006 2001 1999 1987 1982 1982**	**Train struck car that drove around/thru gate**	**8351 (2013)**	**41**	**60**	**UPRR**	**Median**	**Median now exists at crossing (built between 2011-2014). School children go into the street to traverse the crossing. Due to safety concerns, a crossing guard walks the school children across the tracks everyday.**	**A**
751295S	Sunset Avenue	Suisun City, CA	3	2007 2007 1986	Train struck pedestrian on bicycle.	14902 (2013)	41	60	UPRR	Median, Sidewalk	Skewed crossing. Medians and ped improvements installed (2009).	-
751298M	Cordelia Street	Suisun City, CA	1	1994	Car moved over crossing and struck train.	1200 (1988)	18	65	UPRR	-	Skewed Crossing. Spur track crossing 650' to the west.	-
751494U	**Pierce Lane**	**Unincorporated County**	**1**	**2007**	**Truck stuck on crossing.**	**200 (1988)**	**43**	**79**	**UPRR**	**-**	**Humped crossing leading into boat yard (dead end); roadway posted with flooded signage with adjacent water level close to road elevation.**	**Monitor**
751465J	Sereno Drive	Vallejo, CA	1	1976	Car struck by train while crossing .	7000 (1988)	8	20	CFNR	-	No median at crossing. Two-way left turn runs through middle of crossing . Signalized intersections 150' to the east and 425' to the west. RR Gate arms missing in Google Earth photos.	-
751466R	Redwood Street	Vallejo, CA	4	1999 1986 1986 1978	Van stopped while fouling the tracks and was struck by train.	17700 (1995)	8	20	CFNR	-	Signalized intersection 140' east of crossing.	-
751467X	Valle Vista Avenue	Vallejo, CA	3	1990 1979 1978	Car stopped on crossing and was struck by train.	6000 (1995)	8	20	CFNR	-	Crossing less than 20 ft from signalized intersection at Broadway. EB Vehicles Stop upstream of the crossing at RR Limit line.	-
751474H	Georgia Street	Vallejo, CA	1	1978	Car stalled on crossing and was struck by train.	9000 (1988)	8	15	CFNR	-	Signalized intersections 375' to the east and 475' to the west. Raised median stops well short of the median.	-

[1]Crossings with no accident history (per FRA database) and crossings from the Western Railway Museum have been omitted from this summary
All Active Crossings

Solano County Railroad Public Grade Crossings Prioritization Summary[1]

(Crossings listed from North to South)

Crossing Number	Road Name	City	Total Accidents	Accident Date(s)	Most Recent Accident	ADT (year)	Trains per day	Train Speed (mph)	Owner	Recent Improvements	Notes	2015 Priority Ranking
751476W	Solano Avenue	Vallejo, CA	1	1977	Car did not stop at crossing and was struck by train.	4100 (1988)	10	15	CFNR	-	5 Way Signalized intersection 250' west of crossing. Baseball field and large park directly east of Crossing and residential area directly west).	-

[1]Crossings with no accident history (per FRA database) and crossings from the Western Railway Museum have been omitted from this summary
All Active Crossings

3.3 SEA LEVEL RISE

3.3.1 Current Sea Level Rise Policy Background in Solano

The U.S Army Corps of Engineers in 2009 addressed sea level rise in the Engineer Circular (EC) 1165-2-211 (2009) "Incorporating Sea-Level Change (SLC) Considerations in Civil Works Programs," which requires that impacts to coastal and estuarine zones caused by sea-level change must be considered in all phases of Civil Works programs, including rail infrastructure improvements.

In October 2011, the San Francisco Bay Conservation and Development Commission (BCDC) amended the San Francisco Bay Plan to address sea level rise and to deal more broadly with climate change. The Solano Rail Facilities Plan Area is within Map 3 (Suisun Bay and Marsh Map) of the Bay Plan and the amendments and policies apply to the Solano Rail Facilities Rail Plan area. Update includes a review of BCDC new policies regarding any prioritized projects located in the Suisun Marsh Local Protection Plan and elsewhere that may be affected by sea level rise.

Water levels in San Francisco Bay have risen several inches over the past century and are expected to continue to rise (http://www.bcdc.ca.gov/proposed_bay_plan/faqs.shtml). The BCDC Bay Plan report contains maps showing that low-lying land around the Bay may be vulnerable to sea level rise over the next century.

The San Francisco Bay Plan contains the policies that the BCDC uses to determine whether permit applications can be approved for projects within the Commission's jurisdiction, which consists of the Bay, salt ponds, managed wetlands, certain waterways and land within 100 feet of the Bay. BCDC keeps the San Francisco Bay Plan up to date by amending it to deal with new information and new issues, including the new climate change and SLC information.

The new policies and amendments have been approved by the State Office of Administrative Law and the National Oceanic and Atmospheric Administration (NOAA) and are now being applied by BCDC. The new policies also call for the formulation of a regional sea level rise adaptation strategy to protect critical shoreline development and natural ecosystems.

BCDC Bay Plan amendments do not increase BCDC's regulatory jurisdiction or authority. The new climate change policies will be applied by the Commission within its existing jurisdiction using its current regulatory authority. State law explicitly states that the policies are advisory only beyond the Commission's regulatory jurisdiction.

Solano County's General Plan required development of Sea Level Rise Strategic Plan (SLRSP) (http://www.co.solano.ca.us/bosagenda/MG48143/AS48207/AS48236/AS48237/AI49605/DO49773/DO_49773.pdf) and Climate Action Plan for Solano County. These documents were prepared and adopted by the County in 2011. The SLRSP defines three primary objectives: (1) investigate the potential effects of SLR on Solano County, (2) identify properties and resources susceptible to SLR in order to prioritize management strategies, and (3) develop protection and adaptation strategies to meet the County's and region's goals. Adaptive measures for railways in the SLRSP include (page 4-5):

- Protection – Reinforce and raise levees, create buffers
- Adaptation – Design and upgrade rail lines to tolerate periodic flooding and possible long-term inundation (i.e., storm water drainage, elevation of railway, relocation to higher ground, into protected infrastructure corridor)

- Planning – Collaborate with the Union Pacific Railroad, Amtrak, and other applicable transportation agencies to upgrade/reroute the railway through Suisun Marsh.

3.3.2 Solano Rail Infrastructure and Sea Level Rise

The sea level rise is expected as a result of climate change affecting crucial passenger train features, such as railroad tracks and stations in Solano County. Even a small amount of sea level rise associated with storms, high winds, waves, and high tide has the potential to cause flooding in low lying areas along the route.

Current flooding risks occur in many areas along the Capitol Corridor route in Solano County and the frequency of storms is expected to increase in the future due to climate change. STA recognizes that planning for sea level rise needs to begin as part of the Solano Rail Facilities Plan Update, at the ten-year horizon of the Plan Update.

UPRR owns and maintains tracks and levees in Solano County. Solano passenger rail facilities infrastructure improvements will be implemented by the UPRR. CCJPA may want to develop and adopt a formal data sharing agreement with Union Pacific to fill in information gaps in railroad assets (tracks, signal system, bridges), in existing conditions, and in maintenance records. Knowledge of Union Pacific's infrastructure improvement plans would also be helpful in understanding the vulnerabilities of the railroad features to sea level rise.

3.3.3 Passenger Rail Operations and Sea Level Rise in Solano

Capitol Corridor passenger operations include railroad tracks at grade, railroad signal system, railroad bridges, stations, and a maintenance facility in West Oakland, which is outside of the STA area. The following passenger rail operations are vulnerable to sea level rise for the following reasons:

- The railroad system is fixed, interconnected, and lacks redundancy. If one section of rail in the region is compromised, the whole system will be compromised.
- The functionality of the railroad tracks depends upon the signal system; impacts of disruptions to the signal system range from train delays to entire shutdown of the route, depending on the number of disruptions to the signal system at one time.
- CCJPA Suisun-Fairfield station is physically vulnerable to sea level rise due to location and reliance upon external power.
- The complex ownership and management structure for CCJPA system may complicate planning processes.
- There is a lack of public information about railroad infrastructure owned by UPRR (tracks, signal system, and bridges), and there is currently no formal information sharing agreement between Union Pacific and CCJPA regarding infrastructure improvements associated with sea level rise.

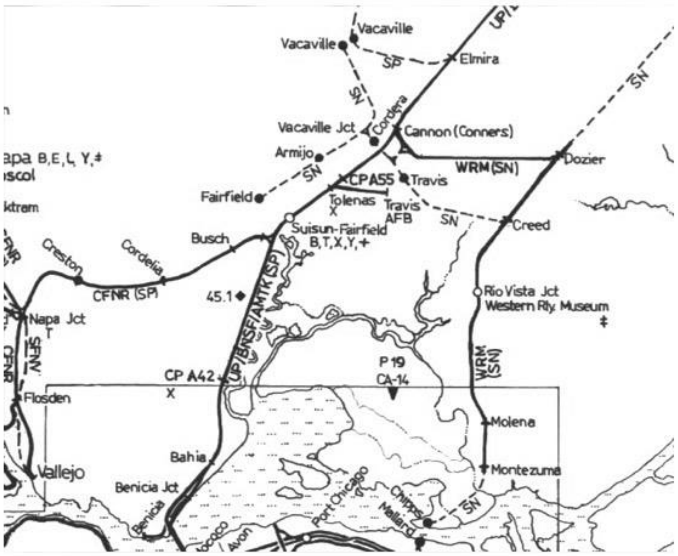
The majority of the rail tracks in Solano County are located in the northern portion of the Suisun Marsh. The area is primarily open and natural, and overall there is minimal human activity surrounding the tracks in the wetlands. As the rail tracks approach north toward Suisun-Fairfield station in Suisun City, land use becomes urban.

The rail tracks crossing Suisun Marsh wetlands area are likely to be impacted by sea level rise. Soil subsidence in the wetlands is an additional concern and is the cause for much of the current UPRR railroad track maintenance in the wetland area to maintain a level surface for the tracks. Inundation of the tracks is likely to occur with sea level rise, and temporary flooding of the tracks may occur with a storm tide.

The Suisun-Fairfield station may be vulnerable to disruption if road access from Suisun City is flooded by future sea level rise. Key station access roads have the potential to be impacted by sea level rise. The Suisun-Fairfield station is not situated adjacent to any surface bodies of water and is less than a half-mile north of the Suisun Slough in Suisun.

As discussed in the Sea Level Rise Vulnerability Assessment prepared by CCJPA (August 21, 2014), other environmental concerns associated with sea level rise in Solano County may include petroleum, currently being transferred in pipelines belonging to Kinder Morgan (the pipelines often located within the Union Pacific right-of-way), and destabilization of railroad embankments could cause distortion and rupture of the pipelines. Relocation and repair of the railroad infrastructure may need to take into account the presence of the pipelines and other underground utilities, potentially requiring relocation of the lines within the right-of-way. Increasing the height of the railroad embankment can cause additional forces on the underground pipelines, which could lead to rupture. Petroleum also has high mobilization potential in floodwater. Creosote is used to protect railroad ties. Creosote has medium mobilization potential in floodwater if exposed for an extended period of time. Air quality could decrease due to increased exhaust from cars during road congestion, which is expected to occur if CCJPA trains experience major disruptions and potential passengers are forced to drive rather than take the train.

Solano Rail Facilities Plan Update



Chapter 4

NAPA-SOLANO RAIL CONNECTIONS UPDATE

4 NAPA-SOLANO RAIL CONNECTIONS UPDATE

4.1 BACKGROUND NAPA-SOLANO 2003 STUDY

Figure 22 provides an overview of the routes that were explored for passenger and freight service potential in the original Napa-Solano connections study of 2003.

The three routes comprise the current operations of California Northern shortline in Solano County between Cordelia Junction, Napa Junction and Vallejo plus the Napa Valley Railroad (NVRR) wine train, which extends north from the former Napa pipe site (at Rocktram) to the Krug winery, north of St. Helena.

The original study concluded that passenger services on all three segments would be expensive to deliver with limited ridership, given the relatively small local population and trip volumes, especially by commuters. Financially, they did not compare well with other commuter rail startup projects which have been funded.

Highway 29 is the major travel artery serving the valley, with major seasonal peaks in congestion levels driven by visitor numbers. The ridership forecasts in the 2003 study, founded on industry best practice and knowledge of 1990s rail startups, showed limited potential for significant mode shift, or positive impact on the SR-29 congestion.

However, because of the assumptions that the service be resident/commute-driven with scope for some daytime visitor travel, the service concept was not focused on visitors rather than commuters as the core market: therefore the opportunity for significantly impacting the peak travel season by capturing significant numbers of visitor trips remained unrealized in the 2003 study. This is a very different rail service concept from the traditional publicly funded commuter rail startup.

Freight rail potential was also seen as somewhat limited (surveys of shippers showed some potential but that that would be well below even the historical levels of rail freight on the route) in spite of the growing wine industry located along the rail corridor.

Modern logistics operations have moved away from small carload-level of shipments, which historically would have moved by rail in the Napa Valley, and today require trucking to a consolidated rail distribution facility. Freight activity was also seen to be highly dependent to the fortunes of the Napa Pipe steel plant (which has since ceased operation).

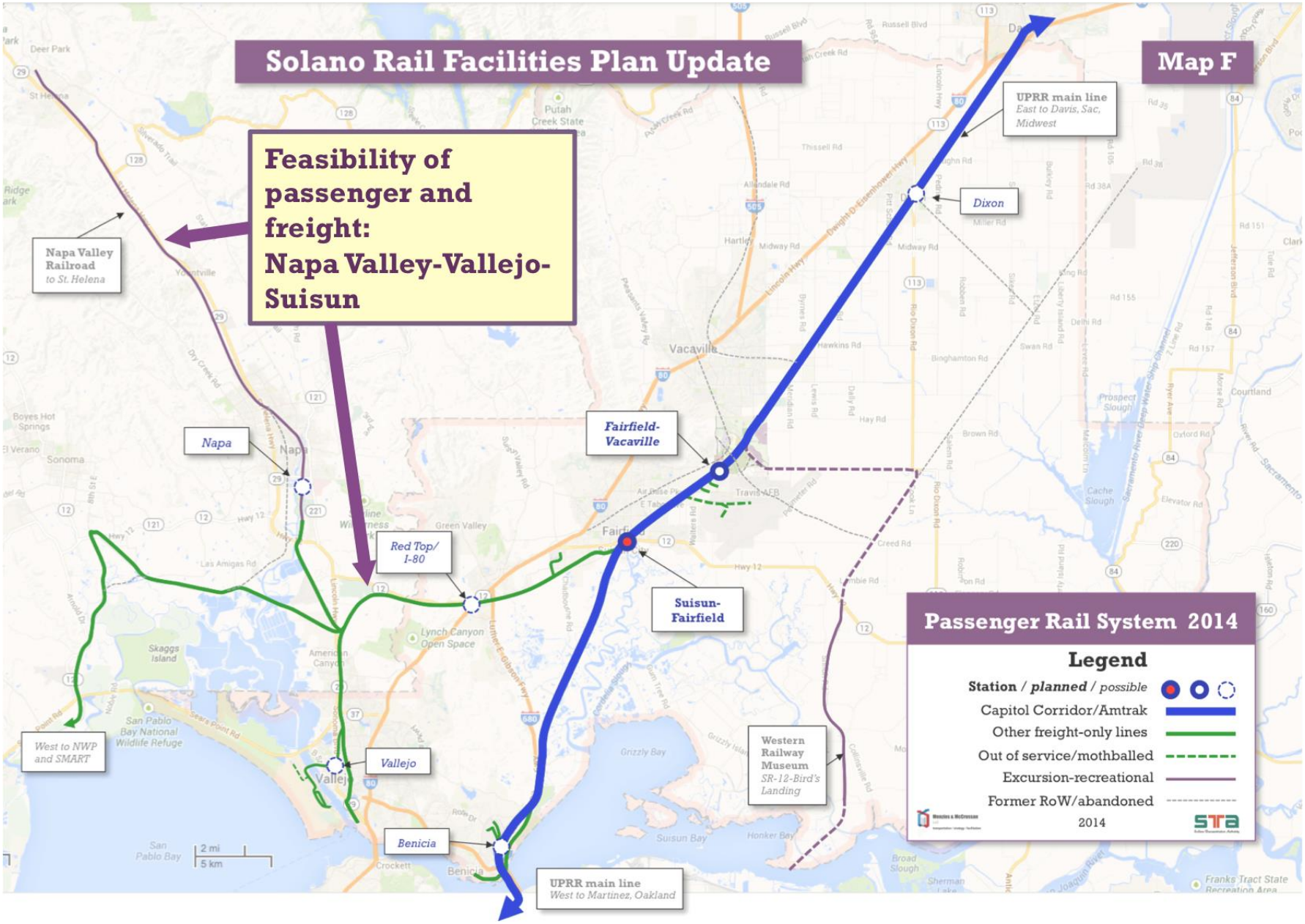
4.2 APPROACH TO THE UPDATE

This update to the 2003 study used available resources and data to revisit key elements of the study. Resources were not available to undertake primary engineering assessments or new ridership forecasts. Rather, the focus was to identify what has changed in:

- **Ridership**
- **Infrastructure**
- **Operations**

The goal was to answer the question: in the intervening 12 years, have the fundamentals changed enough to move the needle on feasibility?

Figure 22 2003 Napa-Solano Connections Study Rail Routes



4.3 RIDERSHIP DEMAND REVISITED

In reviewing ridership in the original 2003 study, the following were observed:

Original Findings

- Commuter ridership did not exceed 2,000 daily on any corridor
- Commute ridership was highly directional 80:20 (little reverse commute)
- Visitor ridership in Vallejo-Napa Valley had an estimated 139,000 annual trips (with visitor service off-peak focused)
- A reopening of the Calistoga extension generated <75 peak period trips (a significant finding, even before infrastructure is considered)

What's Changed

- Population and employment growth in corridor markets have not been revised upward significantly since 2003: there is barely a 5% variation in growth forecasts at the time of the original study and today
- The Napa Pipe Development will add 2,100+ new residents at a new transit oriented development (TOD): although significant, this still likely translates into <250 daily additional rail boardings
- Visitor numbers have continued to grow significantly, now just over 3 million annually[7]
- Ridership on NVRR already exceeds the forecast level of the 2003 study, (with only 2 daily trains), even though it does not directly connect visitors with the major tourist destination of 81% of visitors[8], the wineries
- Traffic conditions on parallel SR-29 and I-80 corridors have not improved
- Although commute ridership would be supported by stronger regional goals (through Plan Bay Area efforts) for integration of land use and transportation than 12 years ago, low-growth policies put an effective ceiling on local commute potential in the corridor

Have changes moved the needle on feasibility?

- Commuter ridership findings from original study are still sound
- Limited rail service frequency likely constrained forecast slightly but not to a significant degree
- Visitor potential was based around utilizing off-peak commute service capacity rather than truly integrated visitor travel needs

The low level of ridership combined with relatively high costs contributed to generally poor levels of financial performance. Both operating costs and growth rates were updated to present-day levels to ensure that some of these original assumptions on operating costs and potential ceilings to ridership where still valid.

Figure 23 summarizes ridership on the three main service segments in the original study, with costs

[7] Napa CVVB

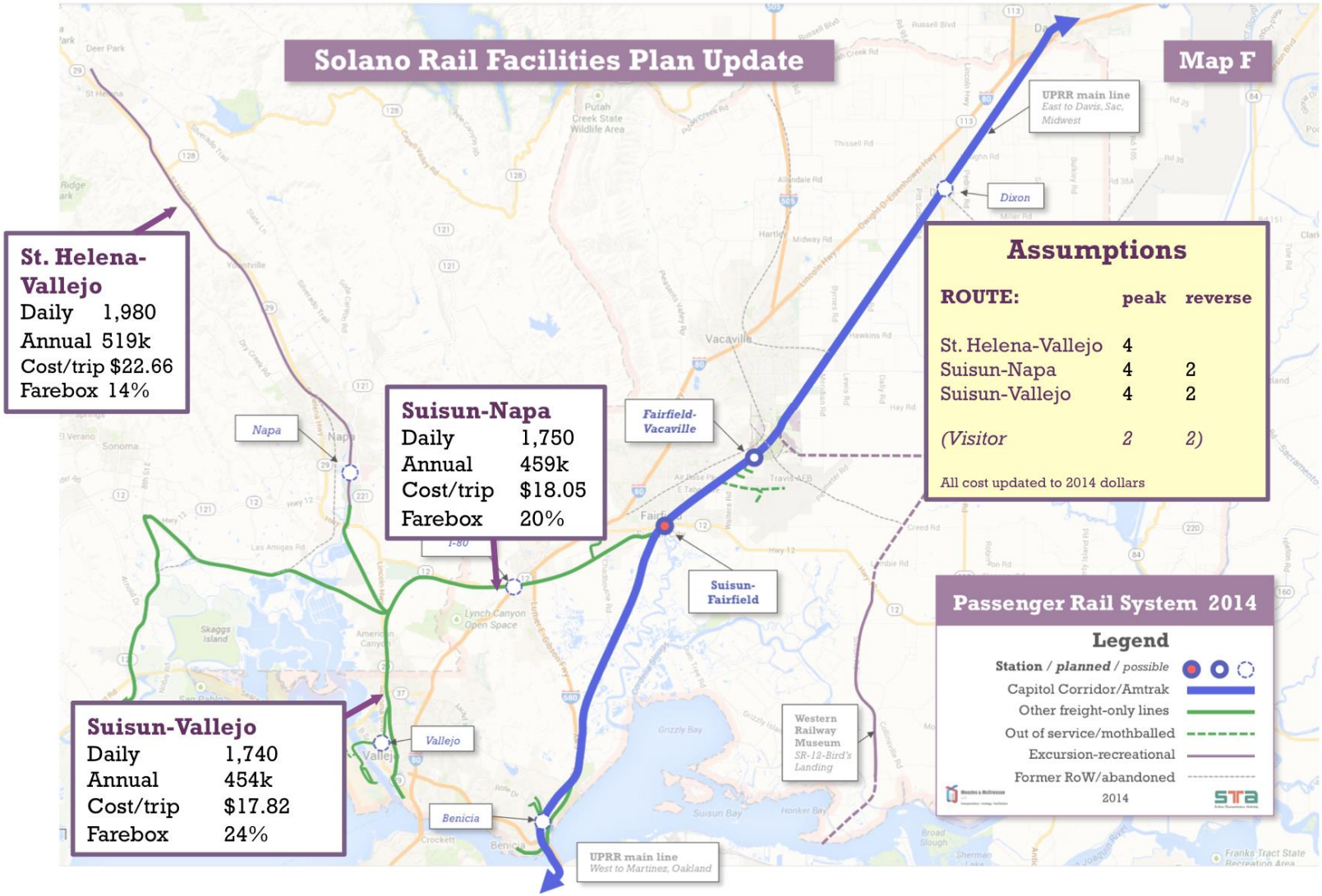
[8] VNV 2012-13 Survey

in updated (2014) operating dollars. Operating cost escalation in the transit industry has been significantly outpacing general inflation since 2003, especially in the Bay Area. The reasons for this cost escalation have been the subject of extensive research elsewhere, and there are differences of interpretation on the causes.

Nevertheless the updating of costs reinforces the original findings in relation to passenger operations: the relatively low farebox recovery of all three services in the 2003 study (Figure 23) would render these uncompetitive candidates for regional funding of new public rail service (by comparison, the three services' farebox recovery was found to be one third to a half of current Capitol Corridor service, for example).

Figure 23 Napa-Solano 2003 Ridership Projections and Updated Costs

Recap: Commute Ridership/Cost per trip (2003 Study)



4.4 RAILROAD INFRASTRUCTURE REVISITED

Original Findings

- All routes and both services are technically feasible, with no rail engineering flaws to delivering service.
- Rail capital costs $120 million for routes (incl. $25 million to Suisun) in 2014 dollars
- Bypass around Napa Pipe alone was required: $29 million
- Restoring abandoned segment to Calistoga: up to $140 million
- 12 stations totaled $21 million: intermodal and basic options were considered
- Vallejo Ferry terminal connection from north via Mare Island Causeway approach

Figure 25 summarizes the original capital cost improvements, updated to 2014 dollars. Although the average cost per mile was not high, the cost of dedicated rolling stock and major structures generated a significant cost burden for the three proposed service segments, given the small level of operating revenue (itself a function of low commute ridership and limited growth, as discussed in section 4.3).

What's Changed

- Major rail improvement projects have been constructed since 2003: Trancas Bridge over Hwy 29, Oxbow Bridge, Napa Station improvements (see Fig 26)
- There is now no need to bypass the Napa Pipe site: with the new TOD project, this location is now a destination and future generator of rail trips.
- Any Krug-Calistoga reopening is even less likely with current land ownership
- Operating and maintenance inflation has outpaced even construction costs growth
- Station costs for basic startup have grown (for conventional project delivery), and given the potential Vallejo Marine terminal freight project, a southern passenger terminus on existing tracks would likely be at the Badge and Pass location
- South approach to Vallejo Ferry terminal is a possibility to be considered with reverse approach from the Vallejo Marine Terminal

The most significant change: In 2002-3, UPRR was in early stages of new ownership/operation. During the course of this update, it was apparent that the owner is highly unlikely now to support Suisun-Vallejo services on CFNR that impacts its main line. No physical connection for passenger service is therefore likely to be approved at Cordelia-Suisun.

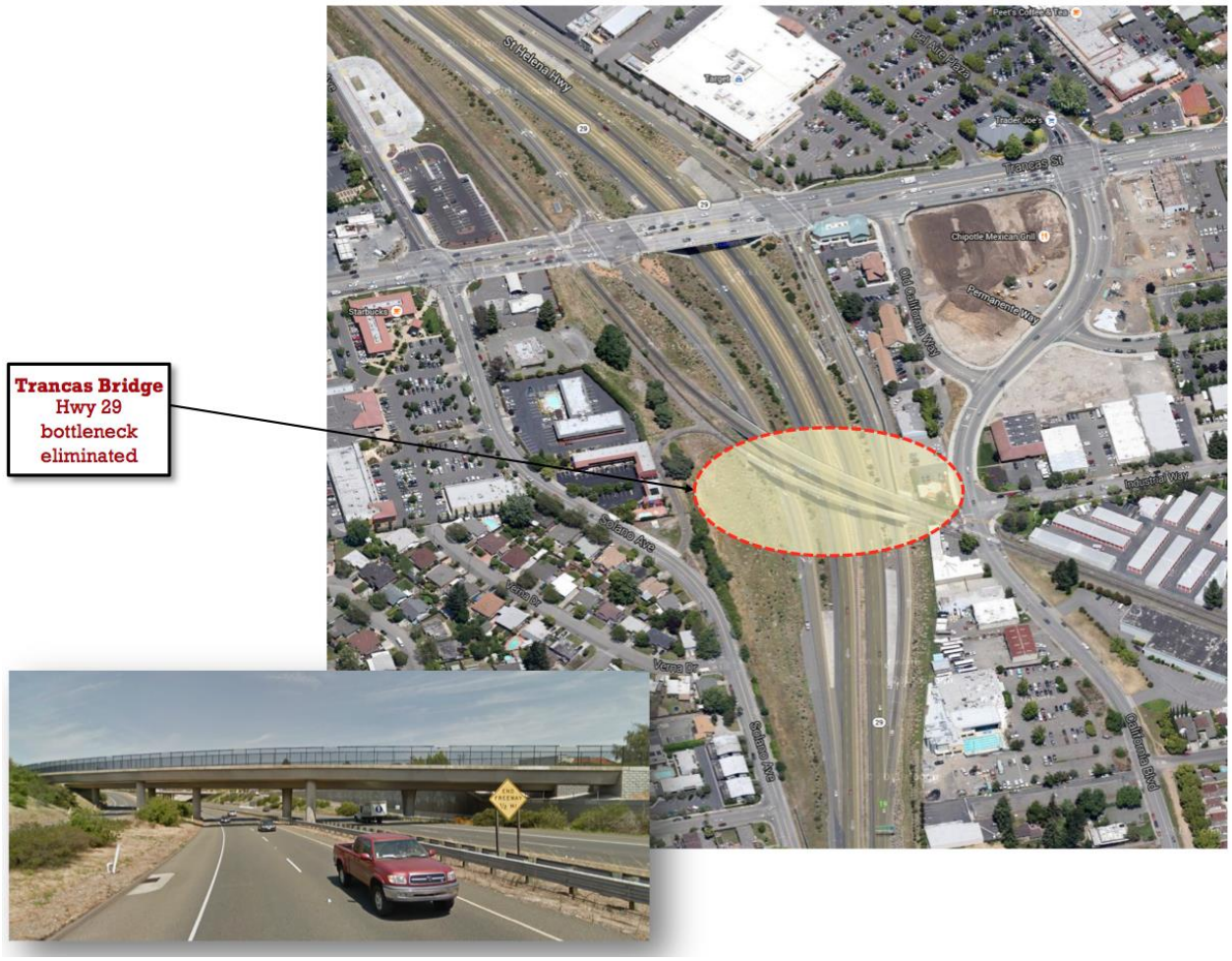
Figure 26 summarizes the major infrastructure changes on the rail corridor that have occurred since 2003 study.

Have changes moved the needle on feasibility?

- Major projects completed have removed $30+ million of costs
- Napa Pipe Development moves from a negative to a positive overall

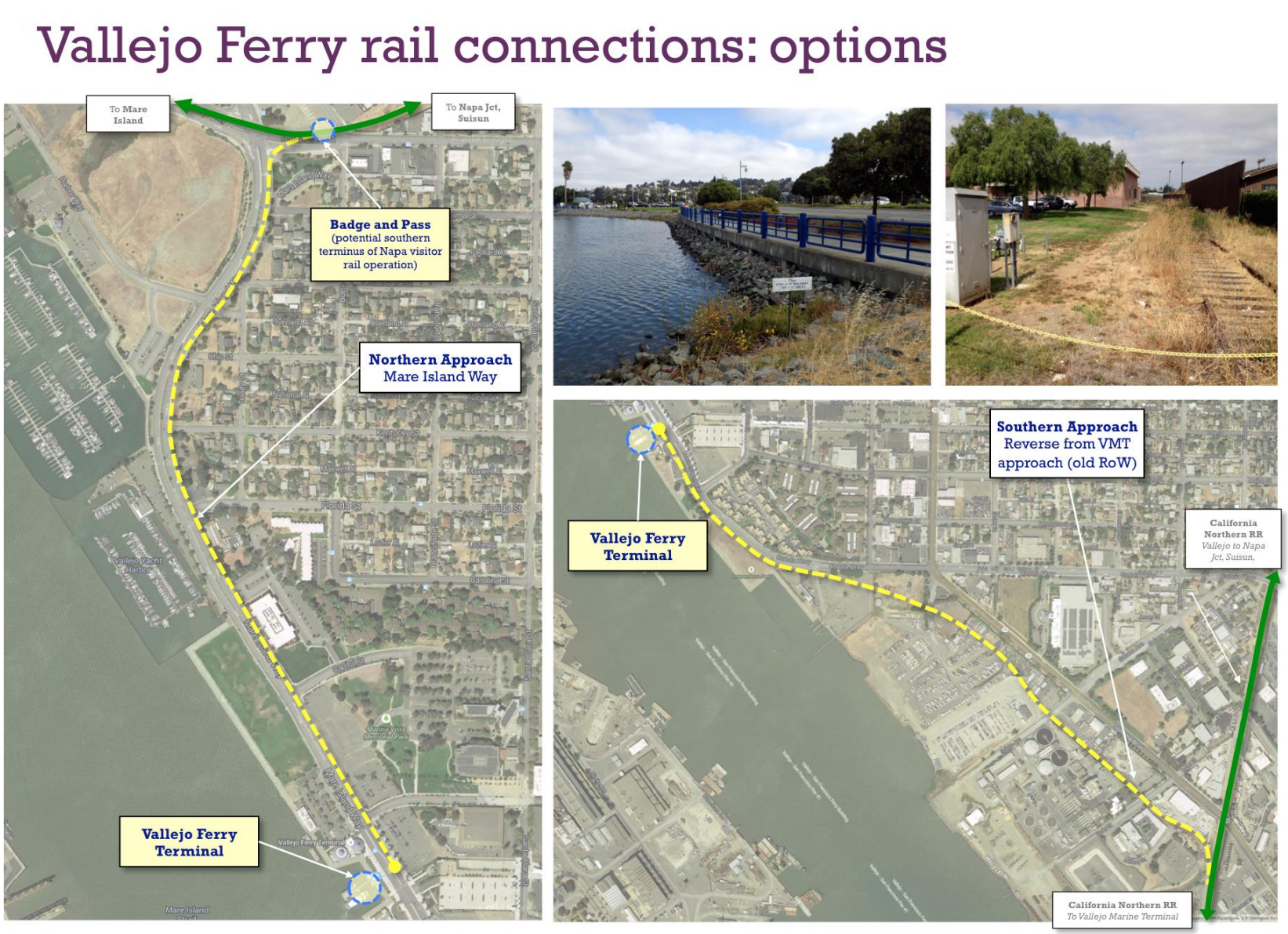
- Cost burdens still require significantly more ridership than original study assumptions

Major Napa Rail Infrastructure Changes (since 2002)



Oxbow Bridge
New structure and station facility

Figure 24 Vallejo Ferry Rail Connection Options



Recap: Napa-Solano Rail Costs (2003 Study)

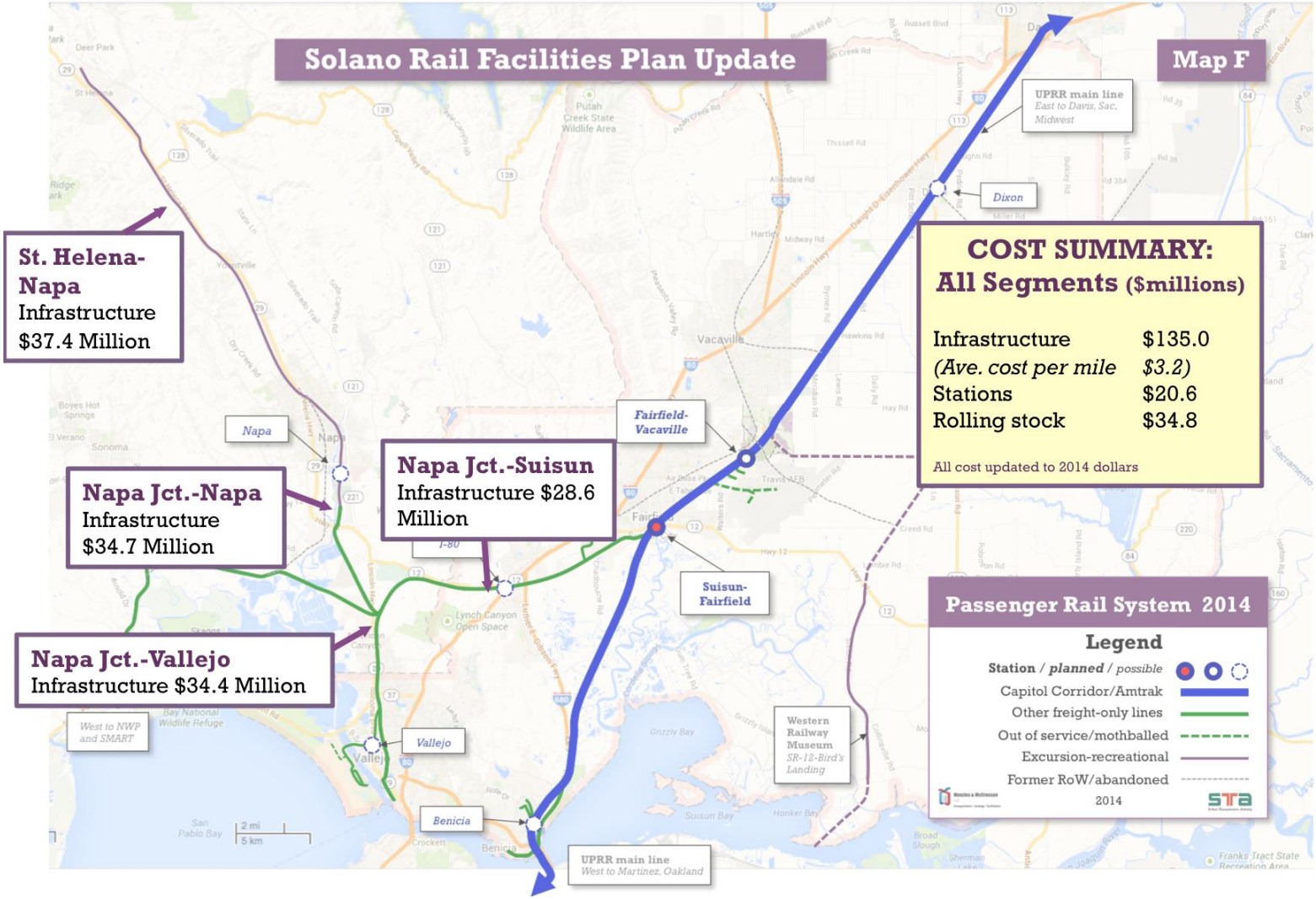


Figure 25 Napa-Solano Capital Costs Updated

Major Napa Rail Infrastructure Changes (since 2002)

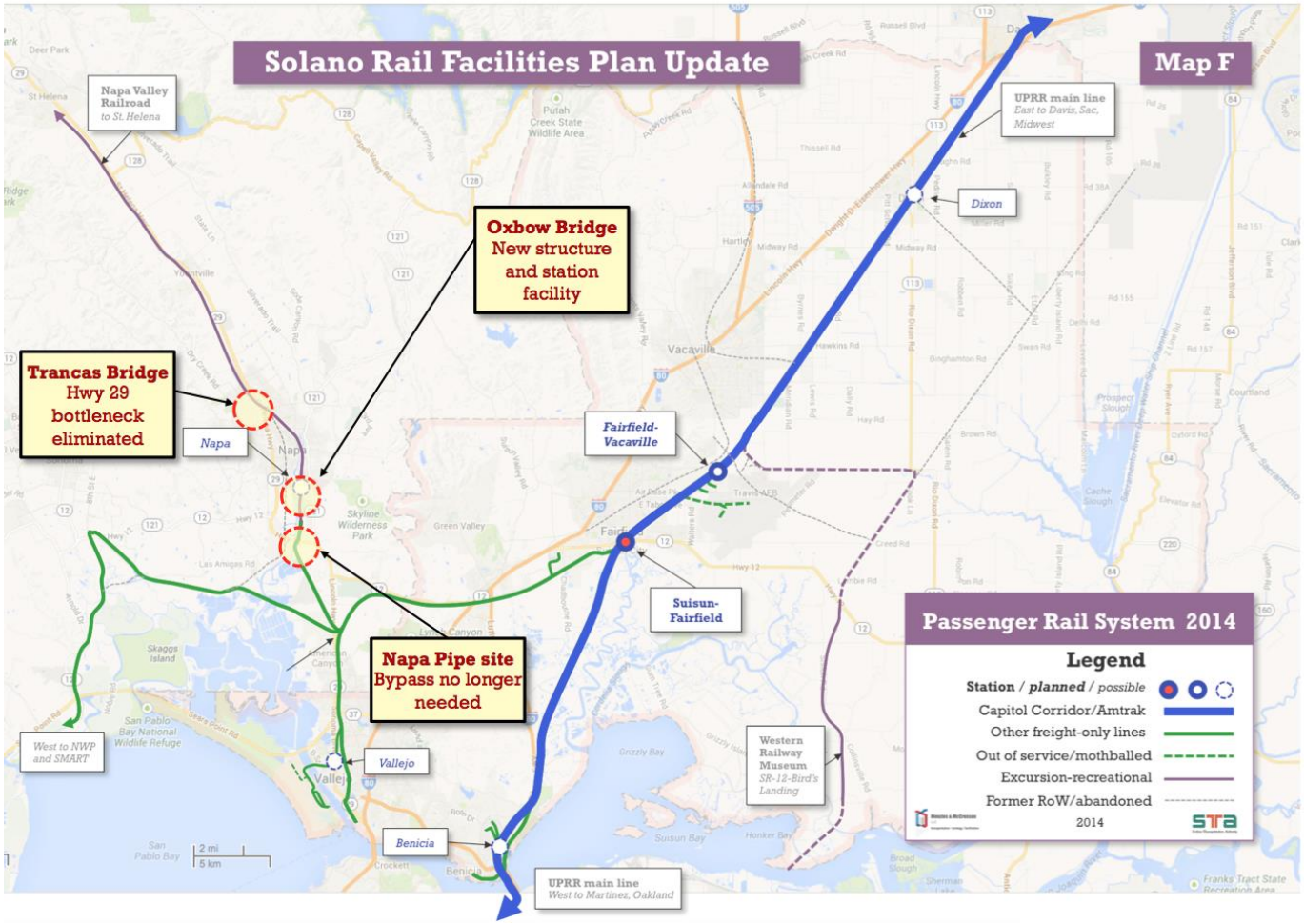


Figure 26 Napa-Solano Major Infrastructure Changes

4.5 PASSENGER OPERATIONS REVISITED

Original Assumptions

- Limited Service with peak-period 60-minute frequency on some routes.
- Off-peak had minimal or no service
- Two daily visitor-oriented services
- 45 mph average speeds
- Passenger station potential ranged for:
    - Key stations at Napa/Vallejo/St Helena
    - Frequently spaced (12+) small stations at every activity node
- Equipment based on heavy diesel multiple unit (DMU) railcars to meet the need for FRA-approved interoperability with freight operations
- The rail service was at a level that would make support transit shuttles a challenge to sustain

What's Changed

- Napa Valley freight rail potential remains limited, given current distribution practices. Freight operations are not a major impediment to 2003 and current passenger rail potential
- The minimal level of freight movements means that the FRA-compliant DMU equipment is less likely to be prerequisite for a future passenger rail service: freight/passenger temporal separation, even with a reestablished freight facility at the Vallejo Marine terminal, appears possible
- Concepts of delivering frequent service levels on startup are more commonplace than in the early 2000's and can promote more immediate ridership growth and mode shift
- Rail startups in region have created more competition for funding: compared with 2002-3, metropolitan planning authority (MPO) and federally routed funds for new rail projects bring even stronger accountability and an expectation of high utilization of expensive rail assets. In this environment, a project with minimal or no public funding requirement has a greater chance of success than a conventional publicly funded startup.
- Passenger (excursion) service has been run over Napa Junction route for first time in decades: during 2013 and 2014, Capitol Corridor excursion trains ran to the Sears Point Raceway on two weekends, in a highly successful trial
- The private sector has recently expressed interest in an expanded visitor train operation along the entire Napa Vallejo corridor which incorporates:
    - Self-propelled DMU trains, lighter and less expensive than those considered during the 2002-03 study (operating bidirectional rather than locomotive-hauled

cars as in the current wine train operation)

- Temporal separation of passenger and freight operations to ensure that light DMUs can be used
- Station stops with a small footprint like those considered in the 2002-03 study, at a minimum serving St. Helena, Napa, Napa Pipe TOD/College and Vallejo

Have changes moved the needle on feasibility?

- Shift to more accountability and operational efficiency makes original assumptions less feasible
- Newer DMU equipment offers more cost effective options (with freight separation)
- Private sector sponsorship of passenger rail in the Napa Valley, with their alternative delivery options, now offers greater cost effectiveness and control of service

4.6 CONCLUSIONS

This update supports the conclusions previously reached, that conventional commuter rail service, using public delivery and funding for startup would face viability challenges on all three routes.

However, as of 2015, there are potential private sector ventures underway to expand recreational trains to more of the corridor, with more frequent service, that may offer general public passenger service in the long-term. These would be purely private ventures without the direct financial support of the local public agencies.

Given the current interest by private sector parties to develop a Napa Valley passenger operation service, this update describes conclusions and potential next steps for the local public agencies rather than specific recommendations for the Solano component of the plan.

Conclusions and next steps under the three components of the update are as follows:

RIDERSHIP DEMAND:

- Commuter market: remains marginal (Napa Pipe TOD development adds some, beyond the 2003 study base) in a conventional operation
- Future commuter growth will be constrained by slow growth policies on the corridor
- The short and long-term visitor market is very healthy, and barely tapped by the current Wine Train operation
- The visitor rail market is the primary foundation of the rail corridor's viability, and the commuter market can be served concurrently with appropriate service

Next Steps for local jurisdictions:

- Consider the rail corridor as integral part of PDA concept, even without active passenger service
- Support passenger service development with flexibility in VINE service mission and delivery
- Vallejo Ferry connection: stay active in determining future service flexibility with WETA (for example, small vessels allow more frequent sailing and support denser rail service)

- Support (via Napa CVB) private efforts to coordinate visitor packages with expanded visitor rail service
- Support seasonal excursion rail to Sears Point (precedent-setting, and opens the possibility of future Sonoma-Marin connection in the long-term)

RAILROAD INFRASTRUCTURE:

- Major structures have been delivered since 2003 – a very favorable foundation for future service, all delivered at public expense
- Track upgrades for 50 mph passenger operation relatively inexpensive
- Choice of rail equipment drives passenger and freight separation/integration
- Vallejo Ferry Terminal connection requires shared RoW if from the northern approach on Mare Island Way: street running trains are less common than in the past and often perceived to generate conflicts with traffic.
- Funding and Implementation: if privately led, needs for local public funds may be minimal or zero.

Next Steps for local jurisdictions:

Local agencies' role dependent on whether a service would be public (unlikely) or (more likely) privately led:

- Future Vine Trail and local improvements should facilitate restart of passenger rail
- Approval of freight rail projects (Marine Terminal) would not likely prejudice future passenger rail
    - Consider fast-track approvals for private sector-led development of the Napa Valley corridor rail service
- Support safe routing and operation of downtown Vallejo rail connection to ferry terminal (an alternative shuttle connection for the mile between the ferry terminal and the northern connection at the Causeway could impose a significant transfer penalty and handicap a passenger operation)

PASSENGER OPERATION:

The conventional commuter rail startup model will remain infeasible and have low regional funding competitiveness

- Current NVRR specialized operation leaves major visitor volumes untapped
- At 300 trips/day, potential benefit of relieving Hwy 29 visitor traffic volumes and congestion remain unrealized
- Commuter rail service needs are limited and shouldn't drive or shape a passenger operation
- Frequent all-day service key to serving visitors, and as a benefit, commuters
- A lower-cost service model is key to feasibility

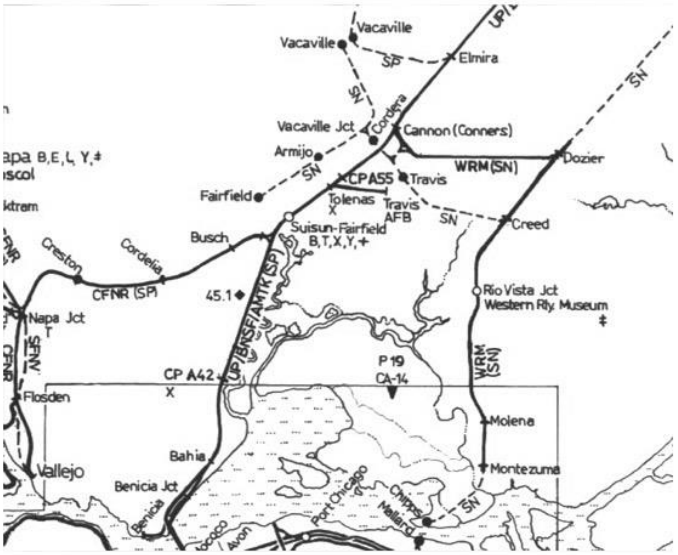
Public and Private rail interests intersect uniquely in the Napa Valley

Next Steps

Local Jurisdictions should:

- Support integrated approach to the entire Napa-Vallejo rail corridor, regardless of ownership
- Support passenger rail service development with flexibility in future VINE transit mission and delivery
- Continue to support freight rail in Vallejo, including Mare Island: freight can be accommodated, can coexist with passenger rail, assures basic maintenance of the rail infrastructure

Solano Rail Facilities Plan Update



Chapter 5

CONCLUSIONS AND RECOMMENDATIONS

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 DRAFT CONCLUSIONS

5.1.1 Freight Demand Needs: Future 10-year

- Freight train numbers may have not recovered to pre-recession levels, and it is unclear when or even if they will within the 10-year horizon.
- Depending on shippers' schedule needs, there are potentially slots available for *all* of the anticipated major growth on mainline-served freight demand in Solano i.e.
    - A daily full crude by rail (CBR) train serving Valero
    - Several Busch-scale production facilities in the three potential Fairfield sites (unlikely even to total a daily trainload)
    - Several large production facilities to be designated in the unincorporated County east of Dixon

5.1.2 Passenger Service Development: Future 10-year

Service levels:

- Within the 10-year horizon, service levels will remain broadly the same, at 30 trains daily.
- However, expansion of CCJPA service beyond the current Oakland-Sacramento core of the corridor will mean that significant additional regional trips will be available from Solano stations within the Plan's 10-year horizon to destinations on the western Oakland-San Jose segment and the Sacramento-Roseville eastern segment.
- Previous concepts of additional regional overlay service in the county (such as Dixon to Auburn) that had been considered in previous plans during the past 20 years are unlikely to be feasible within the 10 year horizon: the current agreement precludes expansion beyond the current ceiling of 30 daily trains and headways of more than 40 minutes within peak periods.
- The CCJPA will continue as the primary forum for Solano jurisdictions to advocate for passenger rail service to their communities. As service levels and station concepts evolve beyond the 10-year horizon, Solano communities should actively prioritize their future investments at a county level, in order to gain most from the competitive funding and policy environment. This is especially important after new service commences at the second (FFV) station, likely in 2018, while communities in other counties may advocate for reduction in station stops in the Corridor overall.
- The four daily long distance Amtrak services connecting the Bay Area with destinations north to Seattle, south to Los Angeles and east to Reno and Chicago do not currently serve Solano communities directly. As one of the largest service areas (by population) on those routes without a station stop, Solano should consider advocating for a Solano stop at SUI or FFV by these trains: these services that are less schedule-critical than Capitol Corridor, and may be accommodated. They have ridership potential for leisure travelers (including Solano's gateway role to the Napa Valley), Travis personnel and their families, and

business travelers using business class product on the Coast Starlight service. Because long distance trains may have longer dwell times at station stops at some locations than a Capitol Corridor train, additional main line capacity may be necessary if these trains were to stop in Solano County.

Travel time improvements:

- Speed and Reliability improvements will be the primary gains in service quality envisaged within the Plan 10-year horizon.
- Overall, improvements in end-to-end corridor travel times (Auburn/Roseville and San Jose end points) can be expected in the order of 10-15 minutes.
- Travel time improvements within Solano County will be in the order of 5 minutes eastbound and westbound from both SUI and FFV stations.

Station provision:

- Within the 10-year horizon of the plan, two stations will serve the county – the existing SUI station and the new FFV station, likely to commence service around 2018.
- Both stations will be conventional CCJPA facilities, with parking to meet forecast demand within the 10-year horizon, opportunities for local transit connections and improved bike and pedestrian access.
- Neither station facility will be staffed by Amtrak (although SUI currently has STA commute consultant customer service representatives during the morning commute). Checked baggage service will not be provided, even if long-distance Amtrak service does make calls in future at the stations in the 10-year horizon.

Local station connections:

- Reliable and seamless local connections for transferring transit passengers, bike users and pedestrians will remain essential to the success for growth in utilization of both SUI and the future FFV stations.
- However, based on no one mode of access data, the majority of trips to and from the station are still likely to occur by automobile.
- Both the SUI and FFV will have parking provision that appears relatively unconstrained during the 10-year plan horizon.
- SUI station provision parking will likely remain shared with the parking lot for commuters on the SR-12 corridor. FFV parking provision in the first phase appears adequate to meet demand within the plan horizon.
- Both parking facilities serving the stations are proposed to remain free for users. The absence of user charge or any demand management system will likely limit the potential for mode of access to shift significantly to alternative modes (although the bike access mode has grown significantly in recent years).
- Without constraints on capacity management of parking demand at the stations, substantial costs may be incurred in serving a relatively small proportion of riders with dedicated

connecting local transit service. Should the local station sponsors wish to actively manage modal shift in access to the stations, some capacity and demand management would likely be required.

- The significant growth in a long-term mixed-use development around the FFV and SUI stations will, however, generate more pedestrian and bicycle trips to the station even above the currently substantial levels.

Policies for future stations:

The Plan has articulated a Solano County-level enhancement of existing adopted CCJPA policies governing the requirements for new stations to be served by Capitol Corridor trains.

The Solano-specific station policy was adopted by the STA Board during the course of the plan development and included in Appendix 3.

In summary, the Solano stations policy:

- Matches the physical design and minimum ridership standards set by the CCJPA Board

- Refines the requirements to tie future approval of stations to completed PDA/station area plans, complete funding packages and approval in principle with the infrastructure owners (primarily Union Pacific Railroad) and CCJPA, via a memorandum of understanding, prior to any substantive design effort being expended by the sponsoring city.

- Only one of the two additional locations identified in the original 1995 Solano rail plan, Dixon (downtown), is proposed to be carried forward within the current plan, although its ability to meet the Solano station criteria means that their development is likely to be beyond the current plan 10-year horizon. Because of concerns about potential ridership, location and ability to meet CCJPA and Solano station criteria, the Benicia (Lake Herman) location is not recommended for future re-evaluation.

Growing Ridership

- Overall ridership growth in the order of 10-20% can be expected within the 10-year horizon.
- The opening of an additional station at Fairfield-Vacaville will likely add up to 15-20% to the total ridership within the county.
- Although the new FFV station may initially share some of the catchment of the current SUI station, growing mixed-use development in the immediate vicinity of both stations will lift ridership levels overall beyond their current totals at each location.
- Depending on the final assumptions in the priority development area (PDA) plan effort for both Suisun (SUI) and the Fairfield-Vacaville (FFV) station area, growth could be at the upper end of this range.
- Full buildout to the FFV station will likely enhance ridership significantly beyond this level, including a substantial walk-shed. Most of this growth will likely be beyond the 10-year horizon

Infrastructure requirements: 10-year horizon

Improvements to corridor infrastructure required to achieve both the eastern and western extensions to intercity service and travel time improvements will mainly be located outside Solano County and include:

3rd Main Track between Sacramento and Roseville

Additional capacity and running time reductions between Oakland and San Jose.

Ongoing capitalized maintenance to maintain reliability to CCJPA's high standards.

CCJPA is investigating the potential effects of sea level rise on its operations (considered in a separate chapter of the plan). An internal CCJPA study is underway to determine the scope of the issue. Once complete, the scope of potential mitigations can be better identified.

Within the county, minor improvements required to maintain these faster schedules will include:

Ongoing Capitalized Maintenance – approx. $1-3 million/year

Positive Train Control (PTC) – installed as part of a larger, system wide program on most Union Pacific main lines to improve overall operations safety

This project is underway, with the majority of the costs borne by UPRR. The PTC project may set the stage, in the future, for discussion with the railroad and regulatory agencies about higher top speeds along the corridor. If realized, these higher speeds could result in 1-2 minute running time reductions within Solano County alone.

Improvements in the vicinity of Bahia to promote fluid freight switching

Depending upon the suite of improvements, the order of magnitude costs could range from $1 million to $20 million (not currently programmed by CCJPA).

Ground improvements in the Suisun Marsh area

Depending upon the geotechnical remediation approach, scope contemplated, and permitting constraints, this could be a $20-$100 million project, possibly performed in conjunction with a program addressing sea level rise.

Infrastructure needs and opportunities: beyond the 10-year Plan horizon

Although beyond the horizon year of the Rail Plan Update, significant infrastructure enhancement concepts are currently being considered as part of vision efforts for the Capitol Corridor. These could reconfigure CCJPA service in the long-term, increasing the total daily trains beyond the current 30 weekday trains and the 40-minute peak period headways. Some may have implications for Solano's very long-term (25+ years ahead) service levels and station locations. These may include:

- Purchase of new right of way
- Partially new alignments potentially revitalizing the former Sacramento Northern line that may ease the service constraints currently imposed by UPRR trackage agreements
- Benicia Narrows high-level rail crossing by-passing downtown Benicia

5.2 DRAFT RECOMMENDATIONS

Service levels:

Solano jurisdictions, coordinated by STA, should establish a passenger rail service and stations priority program to determine the county's focus in station openings and future infrastructure investment on Capitol Corridor.

The cities served by the Suisun-Fairfield and Fairfield-Vacaville stations should determine the benefits and costs of establishing a station stop for the four daily Amtrak long distance services, and when agreed, advocate the appropriate station stop via STA, with Amtrak for the additional daily trains.

Travel time improvements:

Upgrades to the Bahia viaduct could result in increased speeds and a reduction in travel time.

Additional infrastructure to allow freight trains to conduct switching operation off the main line at Benicia Industrial Park could improve reliability and possibly result in a modest reduction in scheduled running time.

Ground improvements in the vicinity of the Suisun Marsh to stabilize the soils and possibly reduce the frequency of temporary speed restrictions and improve reliability. The feasibility and extent of such work would need to be investigated, possibly in conjunction with infrastructure considerations of sea level rise.

Station improvements

Within the 10-year horizon, station capacity is adequate for forecast growth. Towards the end of the 10-year horizon and beyond, two enhancement projects should be revisited:

Suisun-Fairfield station: center island platform, related track improvements and grade separated pedestrian access to eliminate current hold-out arrangements and improve service reliability.

Fairfield-Vacaville station: replacement of planned surface lot with future parking structure to enable station adjacent development to proceed (it should be noted that the current surface lot proposed is adequate for 10-year needs).

Future Dixon station: grade separation of A street crossing (assumes that other CCJPA/Solano policy station policy criteria are met, including MOU/intent with railroad). A major project, which would be a precursor to future station opening, beyond the 10-year horizon of the plan.

Policies for future stations

Future stations will be guided by, and adhere to, the CCJPA stations policy and the Solano specific station policy adopted October 2014. Based on the criteria, after the future Fairfield-Vacaville station is open, Dixon will be the next prioritized station for Solano County.

Local station connections

Station transit connections to rail service will remain the responsibility CCJPA's local transit partners in the County. Although the goal will be to provide seamless transfer for all trains that stop in the county, local providers will determine the level of service, transfer policy based on their priorities and measures of cost effectiveness.

Accommodating Growing Ridership

The second station in the county at Fairfield-Vacaville will meet the near-term growth potential: its early opening is key to the success of growing rail ridership and delivery of a successful station area development program. There is not a currently committed date for opening. Additional passenger equipment may be necessary to accommodate increased ridership; in conjunction with other agencies, the state has already begun the process of acquiring additional rolling stock. Strengthening train length is the most cost-effective way of delivering capacity quickly, in the absence of the ability to increase the frequency of trains.

Infrastructure safety enhancements: 10-year horizon:

Based on the safety analysis undertaken, multiple crossing improvements are recommended, prioritized as follows:

A. E. Tabor Avenue, Fairfield, CA

B. 1st Street, Dixon, CA

C. Canon Road, Fairfield, CA

D. Midway Road, Unincorporated County of Solano, CA

E. Fry Road, Vacaville, CA

F. A Street, Dixon, CA

G. Pedrick Road, Dixon, CA

H. Pierce Lane, Unincorporated County of Solano, CA

Rail Infrastructure capacity enhancements: 10-year horizon:

Ongoing Capitalized Maintenance (approx. $1-3 million/year)

Positive Train Control (PTC) – installed as part of a larger, system-wide program on most Union Pacific main lines to improve overall operations safety.

This project is underway, with the majority of the costs borne by UPRR. The PTC project may set the stage, in the future, for discussion with Union Pacific and regulatory agencies about higher top speeds along the corridor. If realized, these higher speeds could result in 1-2 minute running time reductions within Solano County alone.

Improvements in the vicinity of Bahia to promote fluid freight switching.

Depending upon the suite of improvements, the order of magnitude costs could range from $1 million to $20 million (not currently programmed by CCJPA).

Ground improvements in the Suisun Marsh area.

Depending upon the geotechnical remediation approach, scope contemplated, and permitting constraints, this could be a $20-$100 million project, possibly performed in conjunction with a program addressing sea level rise.

The Plan Recommendations are summarized in Figure 27. Indicative costs are allocated to each, and a lead agency for the project. Secondary agencies are not shown, but each project is likely to have several funding partners.

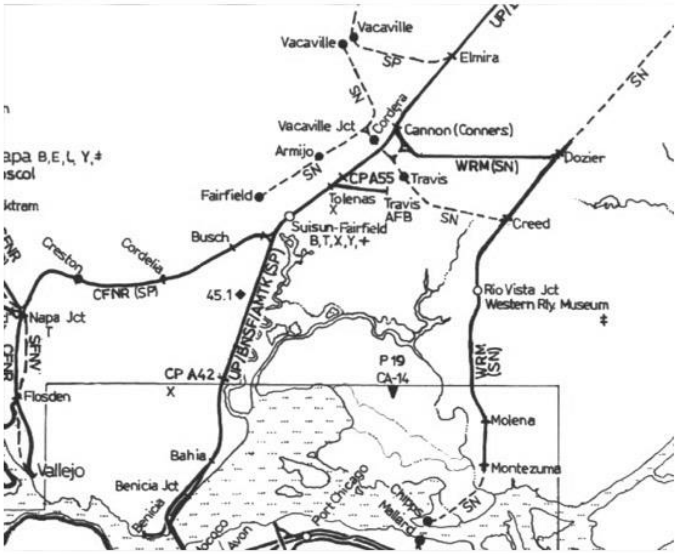
Figure 27 Solano Rail Facilities Plan Recommendations Summary Table

Solano Rail Facilities Plan Update 2015

Plan Recommendations Summary

Topic	Recommendation	Benefit	Cost ($000)	Target Year	Lead Agency
Station improvements	**Suisun-Fairfield station: center island platform, related track improvements and grade separated pedestrian access to eliminate current hold out arrangements**	Eliminate current hold out arrangements and improve passenger safety service reliability.	$ 20,000	2020	City of Suisun City/STA
	Fairfield-Vacaville station: replacement of planned 300 space surface lot with future parking structure	Enable station adjacent development to proceed, supporting use of station	$ 12,000	2025	Cities of Fairfield & Vacaville
	Future Dixon station: grade separation of A street crossing (assumes that other CCJPA/Solano station policy criteria are met, including MOU/intent with railroad).	Precursor to future station opening, beyond the 10-year horizon of the plan	$ 25,000	2025+	City of Dixon/STA
Local station connections	**Local providers will determine the level of service, transfer policy based on their priorities and measures of cost effectiveness**	Provides clarity in level of connecting service to both SUI and FFV stations	$ -	2018	Cities, FAST, CityCoach
Passenger service levels	**Establish a passenger rail service and stations priority program to determine the county's focus in station openings and future infrastructure investment**	Provides clear framework for directing investment in the county on rail service / stations	-	2016	STA
	Determine the benefits and costs of establishing a station stop for the four daily Amtrak long distance services	Serves growing leisure, base personnel and business travelers. Reinforces Solano gateway role to Napa Valley	$ 10	2018	Cities of Fairfield/ Suisun City
Accommodating growing ridership	**Establish target date for near term Fairfield-Vacaville station opening**	Key to the success of growing rail ridership and delivery of a successful station area development program	$ -	2015	City of Fairfield/STA
	Additional passenger equipment to strengthen train length, deliver passenger capacity	The most cost-effective way of delivering capacity quickly	$ -	2017	CCJPA/State
Infrastructure safety enhancements	***Crossing improvements prioritized as follows:***				
	A. E. Tabor Avenue, Fairfield, CA	Safer crossing for peds/vehicles	$ 600	2016	Fairfield
	B. 1st Street, Dixon	Safer crossing for peds/vehicles	$ 20	2016	Dixon
	C.Canon Road, Fairfield	Safer crossing for peds/vehicles	$ 200	2017	Fairfield
	D. Midway Road, Solano Co.	Safer crossing for peds/vehicles	$ 150	2018	Solano Co.
	E. Fry Road, Vacaville, CA	Safer crossing for peds/vehicles	$ 20	2018	Vacaville
	F. A Street, Dixon	Safer crossing for peds/vehicles	$ 150	2018	Dixon
	G.Pedrick Road, Dixon, CA (monitor only)	Safer crossing for peds/vehicles	$ -	annual	Dixon
	H. Pierce Lane, Solano Co., CA (monitor)	Safer crossing for peds/vehicles	$ -	annual	Solano Co.
Rail infrastructure capacity enhancements	**Positive Train Control (PTC)**	Higher top speeds on corridor that could result in 1-2 minute running time reductions within Solano	TBD	2015 (mandate)	UPRR/CCJPA
	Upgrades to the Bahia viaduct	Increased speeds and a reduction in travel time within Solano	TBD	2025	UPRR/CCJPA
	Additional infrastructure to allow freight trains to conduct switching operation off the main line at Benicia Industrial Park /Bahia	Promotes fluid freight switching, improves reliability and possible reduction in scheduled running time	$ 20,000	2020	UPRR/CCJPA
	Ground improvements in the vicinity of the Suisun Marsh to stabilize the soils	Reduces the frequency of temporary speed restrictions and improves reliability	$ 50,000	2020	UPRR/CCJPA
	Ongoing Capitalized Maintenance (annual)	Maintains state of good repair	$ 3,000	annual	CCJPA/STA

Solano Rail Facilities Plan Update



APPENDICES

1 APPENDIX: COMMUNITY IMPACTS SUMMARY

With additional data available from potential rail-served businesses (RSBs) returning to rail and future RSB site development assumptions, a 10-year growth in traffic on the rail network in Solano was developed, broken out by the individual jurisdictions.

Key commodity annual growth factors were applied to current rail served business, to produce a growth in rail movements by site for 2025. Based on the work of the consultant team and knowledge of the industries is concerned, this is regarded the most likely growth scenario (Scenario A).

Freight rail and truck equivalents

The secondary "high growth" alternative (scenario B) was developed, as shown in Figure 28. in this scenario an optimistic set of assumptions was applied: in addition to the commodity-based growth factors applied to the conventional scenario, all of the current mothballed facilities were assumed to revert to appropriate uses (manufacturing/distribution as appropriate), with typical levels of freight rail activity for plants of their size. In addition, all the current and prospective development locations in the Fairfield and Dixon/unincorporated county areas were assumed to accommodate RSB's with a similar scale and profile to those currently in the county. The resultant high-growth scenario would see freight rail traffic back at the levels last seen in the early 1970s.

The high growth scenario did not assume the location of a single large rail-served new heavy manufacturing facility that could push this level of traffic well above even the high-growth scenario shown.

These indicators were reviewed to produce a community impacts summary, covering the following indicators:

- ***Change in overall train movements within each jurisdiction***
- ***Truck equivalent movements that the current and 10-year growth in rail traffic would translate to if they were to travel by road in Solano[9] .***

It should also be noted that some or all of the future growth in rail would most likely *only* be conveyed by that mode, such as crude oil by rail and related petroleum products currently shipped by rail at the port of Benicia: the consultant team therefore did not include any those movements in the truck equivalent calculations.

Nevertheless, the truck equivalent data provide some measure all the benefit of having an adequate rail infrastructure in Solano County to accommodate future traffic growth by these commodities and to these locations.

Conclusions:

- With the exception of crude oil by rail, currently rail traffic movements for existing rail-served businesses are expected to be relatively slow growing in the 10-year horizon.
- Major unknowns which could significantly change this picture positively would include:

[9] Expressed as truck movement numbers, rather than vehicle-miles-traveled on individual routings, since data on site-level commodity origins and destinations was not available.

- Reestablishing rail connections to Travis AFB
- Establishment of rail served businesses is at the five rail connected locations (currently mothballed) in the West Cordelia area on California Northern
- Development of the major rail linked opportunity locations east of Dixon
- Development of the major industry sites identified in the City of Fairfield
- Combined, new rail served site development/reconnections could increase rail traffic in the county movements back to their level historically (1970s) or approximately double their current volume, a significant potential reduction in truck movements

- Even without factoring in 10-year growth rules or new development sites, existing rail services contribute significantly to reducing both truck movements on the county and state highway network as quantified in Figure 28.

Employment benefits

Another measure of the value of freight rail to Solano communities is the level of employment generated by rail served businesses (RSBs). The consultant team used data from the Solano Economic Development Corporation (EDC) to develop a picture of the total employment at rail served businesses (RSBs) in the County[10].

The results show almost 2,300 employees in Solano County working in these locations. This is not to assume that these jobs are all entirely dependent on available freight rail service: nevertheless, the availability of rail service is a factor in business decisions to locate and maintain their presence in Solano County.

These results are summarized in Figure 29.

[10] Businesses recently served/with mothballed rail facilities also in this total. Travis AFB, with 14,000+ employees, is excluded.

Figure 28 Community Impacts Summary by jurisdiction, Solano County: truck equivalent movements

RSB Name	Active/ *inactive / future*	RSB Rail Facility Jurisdiction	Truck equivalents 2015	Truck equivalents 2015 by jurisdiction		Truck equivalents 2025	Truck equivalents 2025 by jurisdiction		Truck equivalents 2025 (high growth)	Truck equivalents 2025 by jurisdiction (high growth)	
Tremont Supply Co (Dixon)	✓ active	Solano Co	730	Solano Co	730	981	Solano Co	981	1,081	Solano Co	13,241
Potential Development Area East	*future*	*Solano Co/Dixon*	-			-			*12,160*		
Campbell Soup Supply Co	*inactive*	*Dixon/Solano Co*	-	*Dixon/Solano Co*	-	-	*Dixon/Solano Co*	-	*547*	*Dixon/Solano Co*	1,094
Sucro-Dixon	*inactive*	*Dixon/Solano Co*	-			-			*547*		
Tolenas Bus Park Clorox	✓ active	Fairfield	6,840	Fairfield	49,742	10,130	Fairfield	74,054	10,130	Fairfield	105,112
Tolenas Bus Park Ball Metal Beverage	✓ active	Fairfield	2,660			4,331			4,331		
Tolenas Bus Park Macro Plastics	✓ active	Fairfield	1,900			3,094			2,814		
Tolenas Bus Park Goodyear	✓ active	Fairfield	1,900			3,094			2,814		
Tolenas Bus Park Nexeo Solutions	✓ active	Fairfield	2,280			3,377			3,377		
Tolenas Bus Park Sunpol Resins	✓ active	Fairfield	3,040			4,502			4,503		
Tolenas Bus Park Compu-Tech Lumber	✓ active	Fairfield	570			695			695		
Tolenas Bus Park Frank-Lin Distillers	✓ active	Fairfield	4,560			6,753			6,753		
Travis AFB	*inactive*	*Fairfield*	-			-			*9,120*		
Anheuser Busch	✓ active	Fairfield	18,240			27,013			27,013		
Sheldon United Terminal	✓ active	Fairfield	5,472			7,355			8,104		
Amcor Rigid Plastics	✓ active	Fairfield	2,280			3,712			2,280		
Tolenas Bus Park Rexam	*inactive*	*Fairfield*	-			-			*2,280*		
Jensen Precast Building Systems (fmr Fibrebond)	*inactive*	*Fairfield*	-			-			*2,280*		
West Cordelia (North bay Auto Auction)	*inactive*	*Fairfield*	-			-			*1,140*		
West Cordelia (White Cap Construction Supply)	*inactive*	*Fairfield*	-			-			*1,520*		
West Cordelia (fmr. Glass Pak)	*inactive*	*Fairfield*	-			-			*2,280*		
West Cordelia (Dependable Plastics)	*inactive*	*Fairfield*	-			-			*1,520*		
Future Plan Area 6 A	*future*	*Fairfield*	-			-			*3,040*		
Future Plan Area 6 B	*future*	*Fairfield*	-			-			*9,120*		
Valero Benicia*	✓ active	Benicia	-	Benicia	32,680	-	Benicia	64,742	-	Benicia	64,742
Benicia Ind Park Terminal Biagi Bros	✓ active	Benicia	3,800			5,628			5,628		
Benicia Ind Park Coca-Cola Enterprises Inc.	✓ active	Benicia	1,520			2,251			2,251		
AmPORTS Auto rack	✓ active	Benicia	27,360			40,519			40,519		
AmPORTS Benicia Port Terminal	✓ active	Benicia	-			16,344			16,344		
Vallejo Mare Island Terminal	✓ active	Vallejo	182	Vallejo	182	222	Vallejo	4,782	760	Vallejo	5,320
Vallejo Marine Terminal	*inactive/ future*	*Vallejo*	-			*4,560*			*4,560*		

* note: petroleum products at Benicia refinery / port are not included in the truck equivalent movements as these have no practical alternative to rail at these volumes

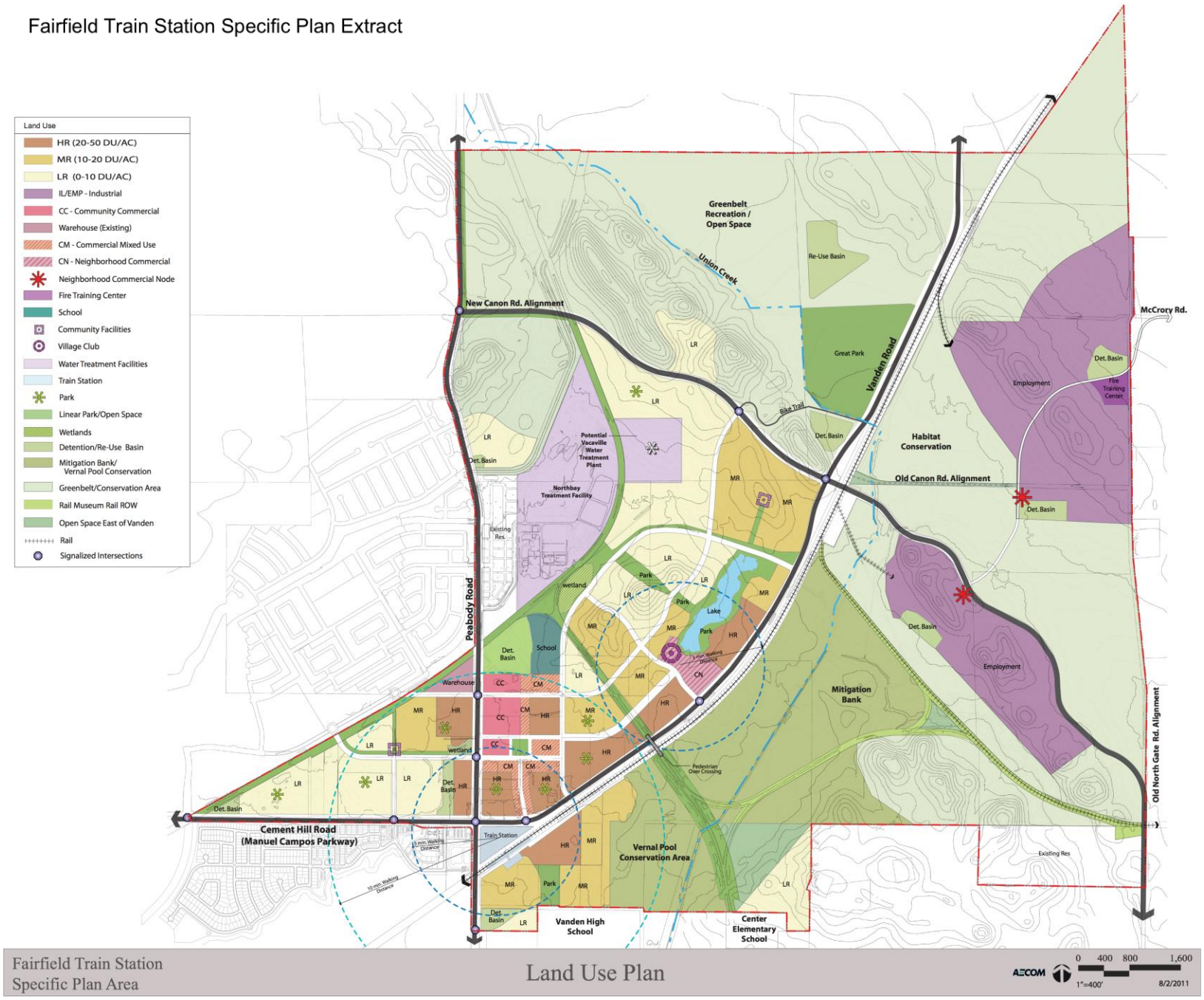
Annual growth rate assumptions (ave. 2015-2025)	
Beverage	4%
Food	3%
Petroleum	3%
Chemicals	4%
Plastics	5%
Lumber	2%
Cement	5%
Distrib	6%
Automotive	4%
Ag	2%

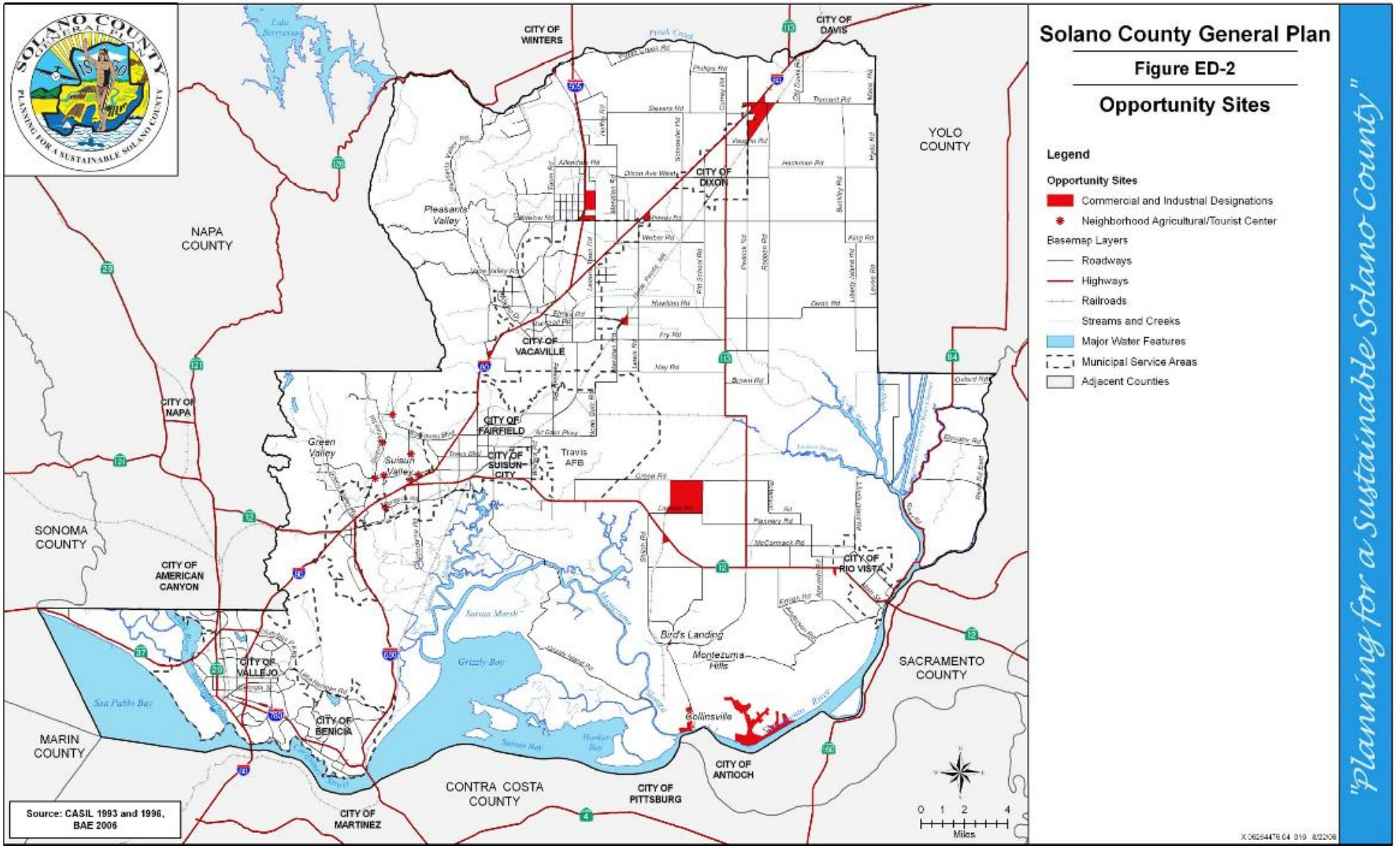
Figure 29 Community Impacts Summary by jurisdiction, Solano County: employment

RSB Name	Active/ *inactive / future*	RSB Rail Facility Jurisdiction	Employment 2013	Employment 2014 by jurisdiction	
Tremont Supply Co (Dixon)	**✓ active**	Solano Co	**20**	**Solano Co**	**20**
Potential Development Area East	***future***	*Solano Co/Dixon*	**-**		
Campbell Soup Supply Co	*inactive*	*Dixon/Solano Co*	***225***	***Dixon/Solano Co***	**245**
Sucro-Dixon	*inactive*	*Dixon/Solano Co*	***20***		
Tolenas Bus Park Clorox	**✓ active**	Fairfield	**131**	**Fairfield (excl. Travis)**	**1,266**
Tolenas Bus Park Ball Metal Beverage	**✓ active**	Fairfield	**140**		
Tolenas Bus Park Macro Plastics	**✓ active**	Fairfield	**38**		
Tolenas Bus Park Goodyear	**✓ active**	Fairfield	**35**		
Tolenas Bus Park Nexeo Solutions	**✓ active**	Fairfield	**25**		
Tolenas Bus Park Sunpol Resins	**✓ active**	Fairfield	**20**		
Tolenas Bus Park Compu-Tech Lumber	**✓ active**	Fairfield	**-**		
Tolenas Bus Park Frank-Lin Distillers	**✓ active**	Fairfield	**160**		
Travis AFB	*inactive*	*Fairfield*	***14,353***		
Anheuser Busch	**✓ active**	Fairfield	**302**		
Sheldon United Terminal	**✓ active**	Fairfield	**12**		
Amcor Rigid Plastics	**✓ active**	Fairfield	**150**		
Tolenas Bus Park Rexam	*inactive*	*Fairfield*	***95***		
Jensen Precast Building Systems (fmr Fibrebond)	*inactive*	*Fairfield*	**-**		
West Cordelia (North bay Auto Auction)	*inactive*	*Fairfield*	***15***		
West Cordelia (White Cap Construction Supply)	*inactive*	*Fairfield*	***30***		
West Cordelia (fmr. Glass Pak)	*inactive*	*Fairfield*	***60***		
West Cordelia (Dependable Plastics)	*inactive*	*Fairfield*	***53***		
Future Plan Area 6 A	***future***	*Fairfield*	**-**		
Future Plan Area 6 B	***future***	*Fairfield*	**-**		
Valero Benicia*	**✓ active**	Benicia	**500**	**Benicia**	**765**
Benicia Ind Park Terminal Biagi Bros	**✓ active**	Benicia	**37**		
Benicia Ind Park Coca-Cola Enterprises Inc.	**✓ active**	Benicia	**120**		
AmPORTS Autorack	**✓ active**	Benicia	**86**		
AmPORTS Benicia Port Terminal	**✓ active**	Benicia	**22**		
Vallejo Mare Island Terminal	**✓ active**	Vallejo	**15**	**Vallejo**	**15**
Vallejo Marine Terminal	*inactive/ future*	*Vallejo*	**-**		

2 APPENDIX: EXISTING CONDITIONS, PLANS, AND POLICIES

Fairfield Train Station Specific Plan Extract




Solano County General Plan
Figure ED-2
Opportunity Sites
Legend
Opportunity Sites
Commercial and Industrial Designations
Neighborhood Agricultural/Tourist Center
Basemap Layers
Roadways
Highways
Railroads
Streams and Creeks
Major Water Features
Municipal Service Areas
Adjacent Counties
"Planning for a Sustainable Solano County"
CITY OF WINTERS
CITY OF DAVIS
YOLO COUNTY
CITY OF DIXON
Pleasants Valley
NAPA COUNTY
CITY OF VACAVILLE
CITY OF NAPA
CITY OF FAIRFIELD
Green Valley
Suisun Valley
CITY OF SUISUN CITY
Travis AFB
SONOMA COUNTY
CITY OF AMERICAN CANYON
CITY OF RIO VISTA
Bird's Landing
Montezuma Hills
SACRAMENTO COUNTY
CITY OF VALLEJO
CITY OF BENICIA
Collinsville
MARIN COUNTY
CONTRA COSTA COUNTY
CITY OF ANTIOCH
CITY OF PITTSBURG
CITY OF MARTINEZ
Source: CASIL 1993 and 1996, BAE 2006
0 1 2 4
Miles

3 APPENDIX: SOLANO STATIONS POLICY (STA Board Item October 2014)

Agenda Item 9.E
October 8, 2014

DATE: September 29, 2014
TO: STA Board
FROM: Sofia Recalde, Associate Planner
RE: Solano Rail Facilities Plan Update

Background:
In March 2014, the STA began work on the Solano Rail Facilities Plan update with assistance from a consultant team led by Menzies & McCrossan. The objectives of the plan are to:

- Evaluate the demand for freight facilities in Solano County;
- Update the 1995 Rail Facilities Plan and examine the potential for new rail stations on the Capitol Corridor line and for improving ridership and service at existing and planned rail stations;
- Consider investment opportunities to improve safety and throughput, and to combat the effects of sea-level rise; and
- Evaluate the potential for Napa-Solano passenger rail connections.

The purpose is to develop a plan that can assist STA and local jurisdictions in making policies and local land use decisions to support future passenger and freight rail activity. The Plan has a projected 10-year life horizon.

A Rail Technical Advisory Committee (RTAC) was established to provide input and feedback as elements of the Plan are developed. The RTAC consists of Planning and Public Works staff from cities whose boundaries contain rail facilities, as well as representatives from Napa County Transportation and Planning Agency (NCTPA), Capitol Corridor Joint Powers Authority (CCJPA) and Solano Economic Development Corporation (Solano EDC). Since the beginning of this Plan, the RTAC has met twice and intends to meet monthly starting in July until the conclusion of this Plan in December 2014.

Discussion:
Capitol Corridor Update
The potential for additional rail stops along the Capitol Corridor is the current task being addressed by this Plan. The DRAFT technical memo (Attachment A) describes the current CCJPA criteria for new rail stations and proposes Solano-specific criteria to help guide decision-making and funding for future passenger stations in Solano County.

CCJPA updated its policies for new train stations in 2006, well after the original Solano's 1995 Rail Facilities Plan was completed. These policies include minimum station standards for ridership, station platform length, accessibility, passenger amenities, and safety and security, as well as having the support of the UPRR and a funding plan. The memo acknowledges that even if a city's proposal meets CCJPA criteria, CCJPA may require additional measures in order to maintain total travel time, system-wide ridership, on-time performance, etc.

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The suggested Solano specific criteria incorporate CCJPA policies and establish requirements to ensure transit connectivity, accessibility, capital and operations/maintenance funding plan to support a new facility, and that the new rail stations are consistent with regional planning and funding requirements.

On September 24, 2014, the TAC forwarded a recommendation to the STA Board to adopt the Solano-Specific Station Criteria as described in Attachment A.

Fiscal Impact:
None.

Recommendation:
Adopt the proposed Solano-Specific Station Criteria as shown on Page 10 in Attachment A.

Attachment:
A. Memo: Potential Passenger Station Criteria in Solano County

CCJPA Current (2006) New Station Policy Criteria

3 Principles	Criteria	Item	Notes
Meet Station Standards	**Ridership**	Min daily average ridership projections of 10 boardings / alightings per train within the first 6 months of CCJPA train service	Several current stations served on the Corridor do not meet this requirement
	Design Criteria	Platforms will be a minimum of 700 ft. in length and 8 inches above top-of-rail (any deviations or exemptions require approval by host railroad and/or CCJPA/Amtrak)	Replaces previous policy of 400 ft. min length, with impacts on several projects planned prior to policy change (e.g. Dixon)
		Goal of having stations separated by a minimum of 5 miles	
		Design will provide access to platforms so that passengers never cross a mainline track (e.g., grade separated access to island platform, station-only track not used by freight trains)	Grade separation requirement brings major design safety improvements but significant costs
	Multi Modal Access	An intermodal transit connection plan must be developed by the station project sponsor that may include joint ticketing or transit transfer with the CCJPA trains	Current policy allows wide latitude for local connecting transit agencies
		Requirements for parking based upon a parking study prepared by project sponsor that will consider: ADA compliance, non-motorized vehicle access, current and future adjacent land uses, baseline (and future) ridership projections, transit and carpool/drop-off connectivity, transit-orientated development plans	Requirements will likely be influenced by priority development area (PDA) plans underway since policy was adopted
		Secure storage bike racks/lockers will be provided at platforms or inside station passenger waiting areas	CCJPA bike plan developed since 2006 has enhanced bike emphasis
	Passenger Amenities	Canopy shelters to provide seating for 12 people and accommodate 2 wheelchairs with capacity to add more shelters to meet future demand	Amtrak's station design guidelines also apply
		Ticket vending machines(s) and associated communication equipment provided at platforms (under canopy) or inside passenger waiting areas	Amtrak's station design guidelines also apply
		Passenger Information Display System (PIDS) provided at platforms and inside station passenger waiting areas, based on CCJPA design specs	Amtrak's station design guidelines also apply
	Safety & Security	Install security cameras on platforms, waiting areas, station facilities, and parking areas with the connecting communication system to be developed as part of design plans	Amtrak's station design guidelines also apply
		Emergency call boxes will be provided, at a minimum, at all unstaffed stations	Amtrak's station design guidelines also apply
		Local law enforcement agency will patrol and inspect station and parking facilities	Requires long-term local jurisdiction financial commitment
		Bomb-resistant trash receptacles will be provided at platforms and inside station passenger waiting areas	Amtrak's station design guidelines also apply
Have Support of Host Railroad	**Railroad Approval**	Coordination/approval of station design plans with "host" railroad	For Solano County this effectively means the support of Union Pacific Railroad at all stages of the process
Funding Plan	**Funding**	Project Sponsor has to provide a complete Funding Plan	

Solano-Specific Potential Station Criteria

Match and Refine CCJPA Criteria

Criteria	Item	Notes
Ridership	Min daily average ridership projections of 10 boardings / alightings per train for **weekday services** within the first 6 months of CCJPA train service	Better reflects the commute oriented trips made by Solano riders
	Any additional station projects will, if necessary, mitigate the schedule impacts of additional stops in order to maintain overall Capitol Corridor-wide travel times.	Ensures that riders at existing station stops are not adversely affected by new station stops on the Corridor.
Design Criteria	Platforms will be a minimum of 700 ft. in length and 8 inches above top-of-rail (any deviations or exemptions require approval by host railroad and/or CCJPA/Amtrak)	Matches CCJPA criteria
	Goal of having stations separated by a minimum of 5 miles	Potential Dixon and Lake Herman Benicia locations meet this criterion
	Design will provide access to platforms so that passengers never cross a mainline track for both side and island platforms. Station-only tracks not used by freight trains are exempt from this provision	Clarifies ambiguity in current policy and minimizes unnecessary large-scale capital costs
Multi Modal Access	Project Sponsors will develop Station Area or Priority Development Area Plans (PDAs) as appropriate, within a half-mile radius of the station, with a clear identification of the number of existing and planned housing units and jobs, market demand analysis, affordable housing, multi-modal connectivity including pedestrian-friendly design standards, strategies to ensure ADA accessibility, parking demand analysis, infrastructure development, implementation plan and financing strategies	Aligns Solano station planning efforts with current local and MPO standards
	Requirements for parking and non-motorized access will be established by the project sponsor undertaking a multimodal access study utilizing CCJPA-approved ridership forecasts and assumptions in the Station Area Plan or PDA as appropriate	Ensures consistency in ridership forecasts for a local station within the overall rail system.Gives project sponsor/local jurisdiction more control over multimodal access requirements for their station
	An intermodal transit connection service plan will be developed by the station project sponsor that will guarantee local transit connections or equivalent "last-mile" provision meeting all trains serving Solano stations	Refines current policy to guarantee local transit connectivity
	Secure storage bike racks/lockers will be provided at platforms or inside station passenger waiting areas	Matches CCJPA criteria
Passenger Amenities	Canopy shelters to provide seating for 12 people and accommodate 2 wheelchairs with capacity to add more shelters to meet future demand	Matches CCJPA criteria
	Ticket vending machines(s) and associated communication equipment provided at platforms (under canopy) or inside passenger waiting areas	Matches CCJPA criteria
	Passenger Information Display System (PIDS) provided at platforms and inside station passenger waiting areas, based on CCJPA design specs	Matches CCJPA criteria
Safety & Security	Install security cameras on platforms, waiting areas, station facilities, and parking areas with the connecting communication system to be developed as part of design plans	Matches CCJPA criteria
	Emergency call boxes will be provided, at a minimum, at all unstaffed stations	Matches CCJPA criteria
	Local law enforcement agency will patrol and inspect station and parking facilities	Matches CCJPA criteria
	Bomb-resistant trash receptacles will be provided at platforms and inside station passenger waiting areas	Matches CCJPA criteria
Railroad Approval	Coordination/approval of station design plans with “host” railroad	Matches CCJPA criteria
	Establish station location memorandum of understanding (MOU) with host railroad and CCJPA before proceeding to detailed design	Refines current criteria to establish station location in principle prior to commitment of substantial design or preconstruction resources
Funding	Project Sponsor has to provide a complete Funding Plan, identifying capital costs for initial operating facility, future long-term expansion cost and operating and maintenance plan, including mid-life upgrades for lifecycle of the facility	Refines the funding plan requirement to identify specifically out front and long-term capital costs, as well as commitment by the project sponsor to maintain the station facility.Note that the PDA/ Station area plans will clarify funding/financing strategies

PRINCIPLES FOR REVISED POLICIES ON STATIONS AND TRAIN SERVICE
CAPITOL CORRIDOR JOINT POWERS AUTHORITY
(January 2006)

POLICY FOR NEW STATION

- Update level of train service (24 weekday, 18 weekend) and number of stations served (16)
- Maintain current criteria and add/update the following new standards:
  - Minimum daily average ridership projections of ten (10) boarding or alightings per train within the first six (6) months of CCJPA train service to the new station.
  - Canopy shelters to provide seating for twelve (12) people (and accommodate two (2) wheelchairs) with capacity to add more shelters to meet future demand
  - Coordination/approval of station design plans with "host" railroad
  - Local law enforcement agency will patrol and inspect station and parking facilities
  - Install security cameras on platforms, waiting areas, station facilities, and parking areas with the connecting communication system to be developed as part of design plans
  - Design will provide access to platforms so that passengers never cross a mainline track (e.g., grade separated access to island platform, station-only track not used by freight trains)
  - Platforms will be a minimum of 700 feet in length and eight (8) inches top-of-rail (any deviations or exemptions will require approval by host railroad and/or CCJPA/Amtrak)
  - Emergency call boxes will be provided, at a minimum, at all unstaffed stations
  - Passenger Information Display System (PIDS) real time electronic message signs will be provided at platforms and inside station passenger waiting areas, based on CCJPA design specifications
  - Bomb-resistant trash receptacles will be provided at platforms and inside station passenger waiting areas
  - Ticket vending machines(s) and associated communication equipment will be provided at either platforms (under the canopy) or inside station passenger waiting areas
  - An intermodal transit connection plan must be developed by the station project sponsor that may include joint ticketing or transit transfer with the CCJPA trains
  - Requirements for parking spaces will be based upon a parking study prepared by the project sponsor that will consider ADA compliance, non-motorized vehicle access, current and future adjacent land uses, baseline (and future) ridership projections, transit and carpool/drop-off connectivity, transit-orientated development plans
  - Secure storage bike racks/lockers will be provided at platforms or inside station passenger waiting areas

POLICY FOR RETENTION OF TRAIN SERVICE TO STATIONS

- Update the minimal ridership standards for continued CCJPA train service to station as follows:
  - Minimum daily average of ten (10) boarding or alightings per train within the first six (6) months of CCJPA train service to the new station
  - Minimum daily average of twelve (12) boarding or alightings per train within two years of CCJPA train service
  - Minimum daily average of fifteen (15) boarding or alightings per train within third year of CCJPA train service
- Develop marketing and operating plans to bring trains back to a station where service had been discontinued

EXPANSION OF SERVICE WITHIN CORRIDOR

- Update standards for trains that are managed by CCJPA for service within corridor (i.e., Regional Rail):
  - Ridership and revenues must be reviewed and approved by CCJPA
  - Any financial operating costs (expenses net of revenues) including any CCJPA management or administrative costs and additional rail equipment must be provided by service sponsor(s)
  - Net cost per train-mile (TM) must be equal to/lower than the current CCJPA train service net costs per TM
  - System operating (or farebox) ratio must be equal to/greater than the current CCJPA train system operating ratio

EXTENSION OF TRAIN SERVICE

- Any extension of CCJPA train service outside the Auburn-Sacramento-Oakland-San Jose corridor shall not drain resources that would prevent the CCJPA from implementing its core service expansion goals for the corridor pursuant to the *Vision Plan*
- Extensions of CCJPA train service outside the corridor shall not denigrate the core CCJPA train service, including but not limited to on-time performance and financial performance (e.g., operating costs, farebox ratio)
- Any financial operating costs (expenses net of revenues) including any CCJPA management or administrative costs and additional rail equipment must be provided by service extension sponsor(s)

ADOPTED FEBRUARY 15, 2006

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4 APPENDIX: STATION RIDERSHIP FORECAST ASSUMPTIONS

Solano Stations Ridership Growth Assumptions

Plan Bay Area Growth Factors

Year	Suisun		Fairfield		Vacaville	
	Households	Employment	Households	Employment	Households	Employment
2014	9,077	3,224	35,673	40,701	31,567	30,932
2018	9,630	3,730	39,850	45,600	33,240	34,890
2024	10,180	4,230	44,020	50,510	34,910	38,860
2040	10,490	4,520	46,410	53,310	35,860	41,120
2010-40	18%	47%	35%	36%	15%	38%

Solano Stations Ridership Growth Assumptions

Growth Factors (Plan Bay Area)

Year	Suisun PDA		Fairfield PDA		Vacaville	
	Households	Employment	Households	Employment	Households	Employment
2014	1,176	1,114	388	456	31,567	30,932
2018	1,460	1,360	980	690	33,240	34,890
2024	2,050	1,870	1,880	1,030	34,910	38,860
2040	2,160	1,960	6,050	2,650	35,860	41,120

Forecast: Upper Range growth+ Fairfield SAP/PDA, Suisun PDA

PDA:	Suisun PDA		Fairfield PDA	
Year	Households	Employment	Households	Employment
	Net New	Net New	Net New	Net New
2024	963	828	1,490	693

Market Analysis Purpose

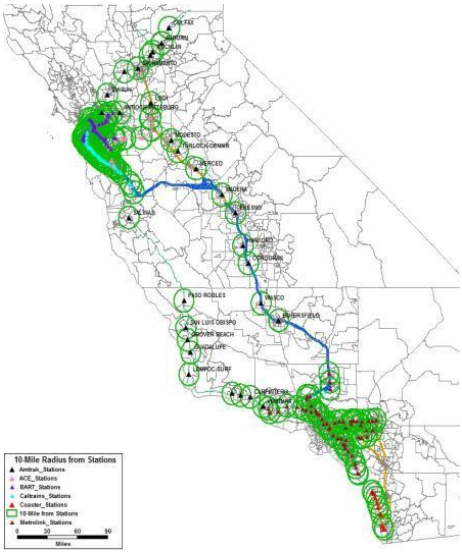
- Identify growth opportunities for increasing rail market share and corresponding rail services
  - Total travel demand (across all modes between origins and destinations)
  - Existing travel patterns for intercity and commuter rail riders
- Design conceptual networks, including identification of options for connecting corridors and service level targets to address potential markets
- Utilize market-based network alternatives to analyze infrastructure constraints

Data Sources

- **California State Travel Demand Model (CSTDM)**
  - 2010 Base Year
  - 2012/13 California Household Travel Survey
  - Auto trips
  - External auto trips
  - Transit, bike and walk trips
- **FRA 2010 CONNECT tool**
  - Local Air Trips to capture internal and external air market
- **Existing Rail Ridership**
  - Amtrak - San Joaquins, Capitol Corridor, Surfliner (includes thruway bus connections)
  - ACE
  - Caltrain
  - COASTER
  - Metrolink
  - Does not include Metrolink transfers or transfers between services

Methodology

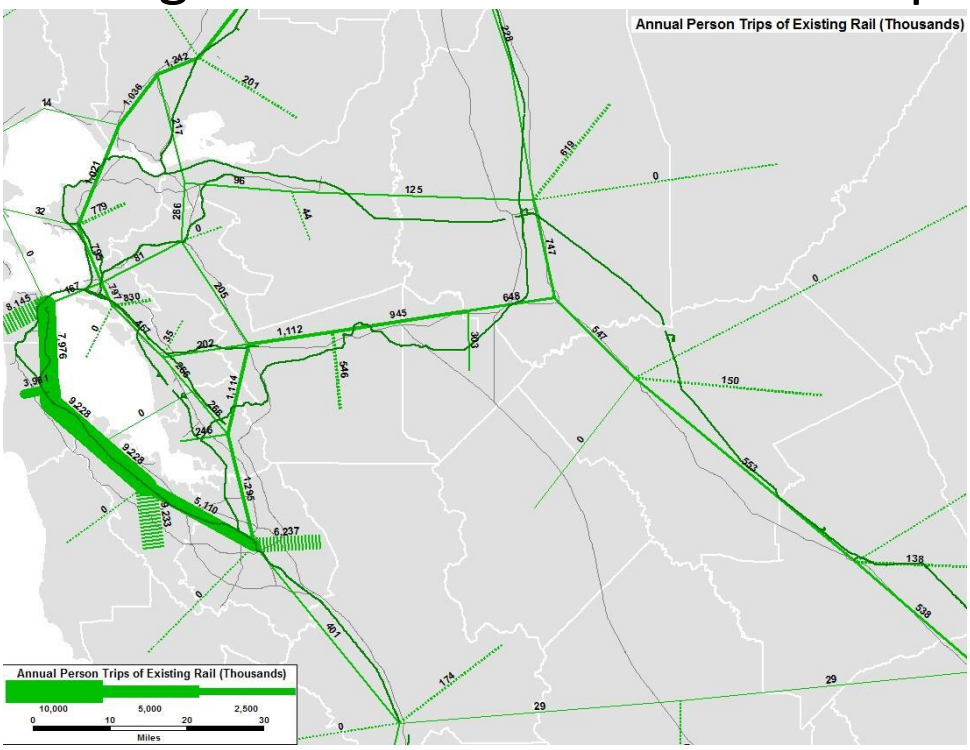
- Aggregate TAZs to Districts
  - Centered around rail station groupings
  - Additional zones to divide non-rail served areas of the state
- O-D matrices by districts for all trips and rail trips



Rail Stations by District

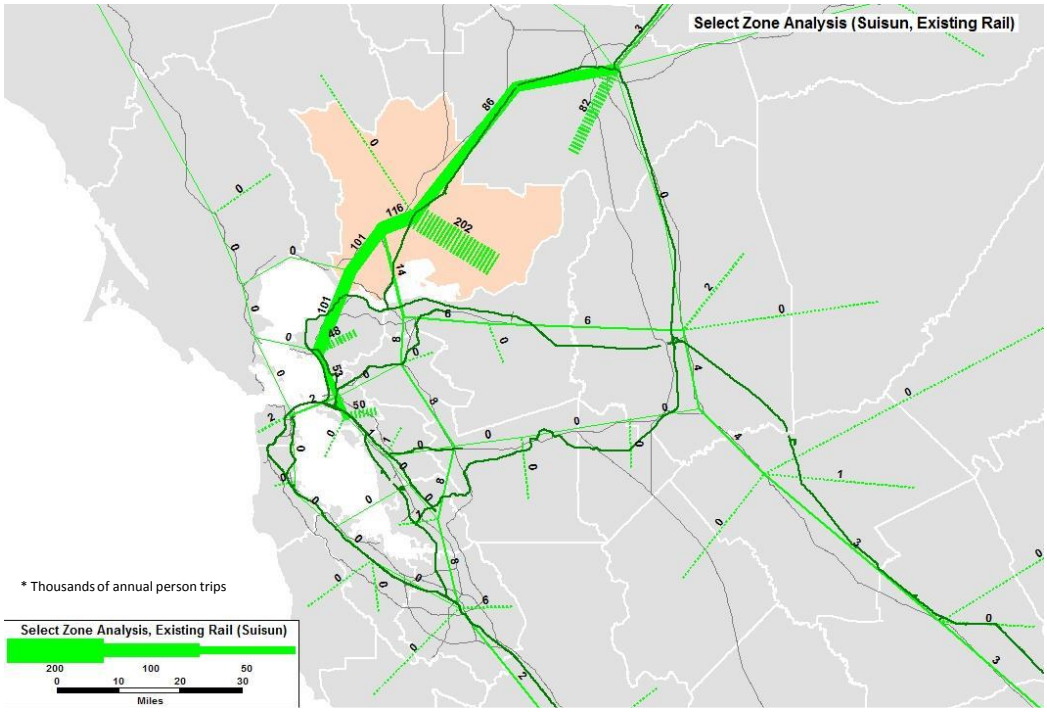
District Name	Existing Rail Stations
San Francisco	San Francisco, 22nd St., Bayshore
San Mateo	South San Francisco, San Bruno, Milbrae, Broadway, Burlingame, San Mateo
Palo Alto	Mountain View, Hayward Park, Hillsdale, Belmont, San Carlos, Redwood City, Atherton, Menlo Park, Palo Alto, California Ave, San Antonio
San Jose	San Jose, Santa Clara/Great America, Sunnyvale, Santa Clara, Lawrence, Tamien, Capitol, Blossom Hill
Fremont	Fremont/Centerville
Hayward	Hayward
Alameda	Oakland, Emeryville
Richmond	Berkeley, Martinez, Richmond
Delta	Antioch
Suisun	Suisun/Fairfield
Sacramento	Davis, Sacramento
Shasta	Redding, Dunsmuir, Marysville, Chico
Placer	Auburn, Roseville, Rocklin
Colfax	Colfax, Truckee
Stockton	Lodi, Stockton, Lathrop
Tracy	Tracy
Livermore	Livermore, Pleasanton, Vasco Rd
Gilroy	Morgan Hill, Gilroy, San Martin
Salinas	Salinas
Modesto	Modesto, Turlock/Denair

Existing Interdistrict Rail Travel - Trips

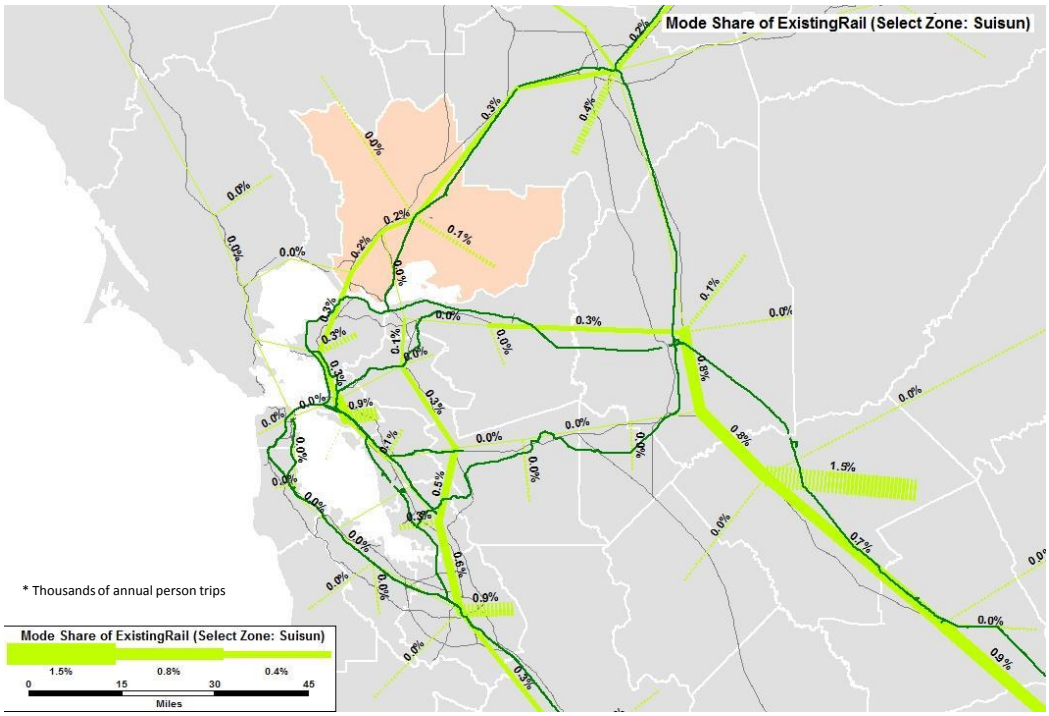


Existing Rail Travel – Mode Share

Suisun District – Rail Trips



Suisun District – Rail Mode Share



6 APPENDIX: CURRENT (MARCH 2015) CAPITOL CORRIDOR SCHEDULE

WEEKDAYS: Westbound — Auburn-Sacramento-Emeryville/San Francisco-Oakland-San Jose

CODE		TRAIN:	521	523	525	527	529	531	711	533	535	537	541	713	543	545	715	547	549	717	551
									SAN JOAQUIN			🚌		SAN JOAQUIN	🚌		SAN JOAQUIN		🚌	SAN JOAQUIN	
COX	**Colfax**	Depart										10:00a			1:25p				4:45p		
ARN	**Auburn/Conheim**	Depart					6:30a					10:30a			1:55p				5:10p		
RLN	**Rocklin**	Depart		🚌	🚌		6:53a					10:45a			2:10p				5:15p		
RSV	**Roseville**	Depart		4:35a	5:25a		7:03a					11:00a			2:25p				5:40p		
SAC	**Sacramento** Ⓐ	Arrive		5:20a	6:05a		7:32a					11:55a			3:20p				6:15p		
		Depart	4:30a	5:30a	6:20a	7:00a	7:40a	8:20a	▼	9:20a	10:10a	12:10p	2:10p	▼	3:35p	4:40p	▼	5:40p	6:50p	▼	9:10p
DAV	**Davis**	Depart	4:45a	5:45a	6:35a	7:15a	7:55a	8:35a	Through Train from Bakersfield	9:35a	10:25a	12:25p	2:25p	Through Train from Bakersfield	3:50p	4:55p	Through Train from Bakersfield	5:55p	7:05p	Through Train from Bakersfield	9:25p
SUI	**Suisun/Fairfield**	Depart	5:09a	6:09a	6:59a	7:39a	8:19a	8:59a		9:59a	10:49a	12:49p	2:49p		4:14p	5:19p		6:19p	7:29p		9:49p
MTZ	**Martinez** Ⓑ	Depart	5:30a	6:30a	7:20a	8:00a	8:40a	9:20a	10:03a	10:20a	11:10a	1:10p	3:10p	3:19p	4:35p	5:40p	6:28p	6:40p	7:50p	8:56p	10:10p
RIC	**Richmond–BART** 2	Depart	5:55a	6:55a	7:45a	8:25a	9:05a	9:45a	10:28a	10:45a	11:35a	1:35p	3:35p	3:44p	5:00p	6:05p	6:53p	7:05p	8:15p	9:22p	10:35p
BKY	**Berkeley**	Depart	6:02a	7:02a	7:52a	8:32a	9:12a	9:52a	No Stop	10:52a	11:42a	1:42p	3:42p	No Stop	5:07p	6:12p	No Stop	7:12p	8:22p	No Stop	10:42p
EMY	**Emeryville**	Depart	6:10a	7:10a	8:00a	8:40a	9:20a	10:00a	Ⓓ10:48a	11:00a	11:50a	1:50p	3:50p	Ⓓ4:03p	5:15p	6:20p	Ⓓ7:13p	7:20p	8:30p	Ⓓ9:43p	10:50p
OKJ	**Oakland Jack London**	Arrive	6:21a	7:21a	Ⓓ8:18a	8:51a	9:38a	Ⓓ10:18a	11:00a	Ⓓ11:18a	12:01p	2:01p	4:08p	4:15p	5:26p	6:38p	7:25p	7:31p	Ⓓ8:48p	9:55p	11:08p
		Depart	6:23a	7:23a		8:53a					12:03p	2:03p			5:28p			7:33p			
OAC	**Oakland Coliseum–BART** 2	Depart	6:32a	7:32a	8:25a	9:02a		10:25a		11:25a	12:12p	2:12p			5:40p			7:44p	8:55p		
HAY	**Hayward**	Depart	6:43a	7:43a		9:13a					12:23p	2:23p			5:52p			7:59p	No Stop		
FMT	**Fremont/Centerville**	Depart	6:59a	7:59a		9:29a					12:39p	2:39p			6:09p			8:17p	No Stop		
GAC	**Santa Clara/Great America**	Depart	7:16a	8:16a		9:46a					12:56p	2:56p			6:27p			8:34p	No Stop		
SCC	**Santa Clara/University**	Depart	7:24a	8:24a		9:54a					1:04p	3:04p			6:35p			8:42p	No Stop		
SJC	**San Jose** 1 Ⓒ	Arrive	7:38a	8:38a		10:13a					1:18p	3:18p			6:48p			8:58p	11:55p	🚌	Connect from 549 to bus at Emeryville

WEEKDAYS: Eastbound

San Jose-Oakland-Emeryville/San Francisco-Sacramento-Auburn

CODE	STATION	TRAIN:	BUS # 3802*	520	522	712	524	526	714	528	530	716	532	534	536	538	540	542	718	544	546	548
SJC	**San Jose** 1 C	Depart	THIS IS A BUS-ONLY ROUTE*			SAN JOAQUIN	6:40a		SAN JOAQUIN	9:05a			12:20p			3:10p		4:20p	SAN JOAQUIN	5:50p	7:15p	
SCC	**Santa Clara University**	Depart					6:46a			9:11a			12:26p			3:16p		4:26p		5:56p	7:21p	
GAC	**Santa Clara-Great America**	Depart					6:54a			9:19a			12:34p			3:24p		4:34p		6:04p	7:29p	
FMT	**Fremont-Centerville**	Depart					7:11a			9:38a			12:51p			3:43p		4:51p		6:21p	7:46p	
HAY	**Hayward**	Depart					7:26a			9:54a			1:06p			3:59p		5:06p		6:36p	8:01p	
OAC	**Oakland Coliseum–BART** 2	Depart					7:36a	8:55a		10:04a			1:16p			4:09p		5:16p		6:46p	8:11p	9:55p
OKJ	**Oakland Jack London**	Arrive					7:43a	9:03a		10:13a			1:23p			4:18p		5:23p		6:53p	8:18p	10:03p
		Depart		5:25a	6:25a	7:30a	7:45a	9:15a	10:05a	10:15a	12:15p	1:15p	1:25p	2:50p	3:30p	4:20p	4:50p	5:30p	5:50p	6:55p	8:20p	10:05p
EMY	**Emeryville**	Depart		5:35a	6:35a	7:40a	7:55a	9:25a	10:15a	10:25a	12:25p	1:25p	1:35p	3:00p	3:40p	4:30p	5:00p	5:45p	6:00p	7:05p	8:30p	10:15p
BKY	**Berkeley**	Depart		5:39a	6:39a	No Stop	7:59a	9:29a	No Stop	10:29a	12:29p	No Stop	1:39p	3:04p	3:44p	4:34p	5:04p	5:49p	No Stop	7:09p	8:34p	10:19p
RIC	**Richmond–BART** 2	Depart		5:47a	6:47a	7:49a	8:07a	9:37a	10:24a	10:37a	12:37p	1:34p	1:47p	3:12p	3:52p	4:42p	5:12p	5:57p	6:09p	7:17p	8:42p	10:27p
MTZ	**Martinez** B	Depart	4:45a	6:14a	7:14a	8:19a	8:34a	10:04a	10:54a	11:04a	1:04p	2:04p	2:14p	3:39p	4:19p	5:09p	5:39p	6:24p	6:39p	7:44p	9:09p	10:54p
SUI	**Suisun/Fairfield**	Depart	5:15a	6:33a	7:33a	Through Train to Bakersfield	8:53a	10:23a	Through Train to Bakersfield	11:23a	1:23p	Through Train to Bakersfield	2:33p	3:58p	4:38p	5:28p	5:58p	6:43p	Through Train to Bakersfield	8:03p	9:27p	11:13p
DAV	**Davis**	Depart	5:55a	6:57a	7:57a	▼	9:17a	10:47a	▼	11:47a	1:47p	▼	2:57p	4:22p	5:02p	5:52p	6:22p	7:07p	▼	8:27p	9:52p	11:37p
SAC	**Sacramento** A	Arrive	6:25a	7:23a	8:23a		9:48a	11:13a		12:18p	2:13p		3:28p	4:48p	5:22p	6:23p	6:48p	7:38p		8:58p	10:28p	12:03a
		Depart					10:15a			1:00p			4:00p		5:25p		L7:00p	L7:50p		L9:10p		
RSV	**Roseville**	Depart					D10:45a			D1:30p			D4:30p		5:48p		D7:30p	D8:20p		D9:40p		
RLN	**Rocklin**	Depart					D11:00a			D1:45p			D4:45p		5:56p		D7:45p	D8:35p		D9:55p		
ARN	**Auburn/Conheim**	Depart					D11:25a			D2:00p			D5:10p		6:30p		D8:00p	D8:50p		D10:10p		
COX	**Colfax**	Arrive					D11:40a			D2:15p			D5:25p									

WEEKENDS/HOLIDAYS: Westbound — Auburn-Sacramento-Emeryville/SF-Oakland-San Jose

CODE	STATION	TRAIN:	723	727	711	729	733	737	741	713	743	745	715	747	749	717	751
					SAN JOAQUIN					SAN JOAQUIN			SAN JOAQUIN			SAN JOAQUIN	
COX	**Colfax**	Depart						10:00a			1:25p				4:20p		
ARN	**Auburn/Conheim**	Depart				**8:10a**		10:30a			1:55p				4:50p		
RLN	**Rocklin**	Depart				**8:33a**		10:45a			2:10p				5:05p		
RSV	**Roseville**	Depart		5:25a		**8:43a**		11:00a			2:25p				5:20p		
SAC	**Sacramento** A	Arrive		6:05a		**9:12a**		11:55a			3:20p				6:15p		
		Depart	**5:50a**	**8:10a**	▼ Through Train from Bakersfield	**9:15a**	**10:40a**	**12:10p**	**2:10p**	▼ Through Train from Bakersfield	**3:55p**	**4:40p**	▼ Through Train from Bakersfield	**5:40p**	**7:10p**	▼ Through Train from Bakersfield	**9:10p**
DAV	**Davis**	Depart	**6:05a**	**8:25a**		**9:30a**	**10:55a**	**12:25p**	**2:25p**		**4:10p**	**4:55p**		**5:55p**	**7:25p**		**9:25p**
SUI	**Suisun/Fairfield**	Depart	**6:29a**	**8:49a**		**9:54a**	**11:19a**	**12:49p**	**2:49p**		**4:34p**	**5:19p**		**6:19p**	**7:49p**		**9:49p**
MTZ	**Martinez** B	Depart	**6:50a**	**9:10a**	**10:03a**	**10:15a**	**11:40a**	**1:10p**	**3:10p**	**3:19p**	**4:55p**	**5:40p**	**6:28p**	**6:40p**	**8:10p**	**8:56p**	**10:10p**
RIC	**Richmond–BART** 2	Depart	**7:15a**	**9:35a**	**10:28a**	**10:40a**	**12:05p**	**1:35p**	**3:35p**	**3:44p**	**5:20p**	**6:05p**	**6:53p**	**7:05p**	**8:35p**	**9:22p**	**10:35p**
BKY	**Berkeley**	Depart	**7:22a**	**9:42a**	No Stop	**10:47a**	**12:12p**	**1:42p**	**3:42p**	No Stop	**5:27p**	**6:12p**	No Stop	**7:12p**	**8:42p**	No Stop	**10:42p**
EMY	**Emeryville**	Depart	**7:30a**	**9:50a**	ⓓ**10:48a**	**10:55a**	**12:20p**	**1:50p**	**3:50p**	ⓓ**4:03p**	**5:35p**	**6:20p**	ⓓ**7:13p**	**7:20p**	**8:50p**	ⓓ**9:43p**	**10:50p**
OKJ	**Oakland Jack London**	Arrive	**7:41a**	**10:01a**	**11:00a**	**11:06a**	ⓓ**12:38p**	**2:01p**	**4:01p**	**4:15p**	**5:46p**	**6:38p**	**7:25p**	**7:31p**	**9:08p**	**9:55p**	**11:08p**
		Depart	**7:43a**	**10:03a**		**11:08a**		**2:03p**	**4:03p**		**5:48p**			**7:33p**	10:00p		
OAC	**Oakland Coliseum–BART** 2	Depart	**7:52a**	**10:12a**		**11:17a**	**12:45p**	**2:12p**	**4:12p**		**6:00p**			**7:42p**	No Stop		
HAY	**Hayward**	Depart	**8:03a**	**10:23a**		**11:28a**		**2:23p**	**4:23p**		**6:12p**			**7:53p**	No Stop		
FMT	**Fremont/Centerville**	Depart	**8:19a**	**10:39a**		**11:44a**		**2:39p**	**4:39p**		**6:27p**			**8:09p**	No Stop		
GAC	**Santa Clara/Great America**	Depart	**8:36a**	**10:56a**		**12:01p**		**2:56p**	**4:56p**		**6:47p**			**8:26p**	No Stop		
SCC	**Santa Clara/University**	Depart	**8:44a**	**11:04a**		**12:09p**		**3:04p**	**5:04p**		**6:55p**			**8:34p**	No Stop		
SJC	**San Jose** 1 C	Arrive	**8:58a**	**11:18a**		**12:23p**		**3:18p**	**5:18p**		**7:08p**			**8:48p**	11:55p		

WEEKENDS/HOLIDAYS: Eastbound — San Jose-Oakland-Emeryville/SF-Sacramento-Auburn

CODE	STATION	TRAIN:	720	712	724	714	728	732	716	734	736	738	742	718	744	746	748
SJC	San Jose 1 C	Depart		SAN JOAQUIN	7:50a	SAN JOAQUIN	10:10a		SAN JOAQUIN	12:50p		3:40p	5:10p	SAN JOAQUIN	6:05p		9:10p
SCC	Santa Clara/University	Depart			7:56a		10:16a			12:56p		3:46p	5:16p		6:11p		9:16p
GAC	Santa Clara/Great America	Depart			8:04a		10:24a			1:04p		3:54p	5:24p		6:19p		9:24p
FMT	Fremont/Centerville	Depart			8:21a		10:41a			1:21p		4:11p	5:41p		6:36p		9:41p
HAY	Hayward	Depart			8:36a		10:56a			1:36p		4:26p	5:56p		6:51p		9:56p
OAC	Oakland Coliseum-BART 2	Depart			8:46a		11:06a			1:46p		4:36p	6:06p		7:01p		10:06p
OKJ	Oakland Jack London	Arrive			8:53a		11:13a			1:53p		4:43p	6:13p		7:08p		10:13p
		Depart	7:50a	7:30a	8:55a	10:05a	11:15a	12:25p	1:15p	1:55p	3:25p	4:45p	6:20p	5:50p	7:10p	7:55p	10:15p
EMY	Emeryville	Depart	8:00a	7:40a	9:05a	10:15a	11:25a	12:35p	1:25p	2:05p	3:35p	4:55p	6:30p	6:00p	7:20p	8:05p	10:25p
BKY	Berkeley	Depart	8:04a	No Stop	9:09a	No Stop	11:29a	12:39p	No Stop	2:09p	3:39p	4:59p	6:34p	No Stop	7:24p	8:09p	10:29p
RIC	Richmond-BART 2	Depart	8:12a	7:49a	9:17a	10:24a	11:37a	12:47p	1:34p	2:17p	3:47p	5:07p	6:42p	6:09p	7:32p	8:17p	10:37p
MTZ	Martinez B	Depart	8:39a	8:19a	9:44a	10:54a	12:04p	1:14p	2:04p	2:44p	4:14p	5:34p	7:09p	6:39p	7:59p	8:44p	11:04p
SUI	Suisun/Fairfield	Depart	8:58a	Through Train to Bakersfield	10:03a	Through Train to Bakersfield	12:23p	1:33p	Through Train to Bakersfield	3:03p	4:33p	5:53p	7:28p	Through Train to Bakersfield	8:18p	9:03p	11:23p
DAV	Davis	Depart	9:22a		10:27a		12:47p	1:57p		3:27p	4:57p	6:17p	7:52p		8:42p	9:27p	11:47p
SAC	Sacramento A	Arrive	9:48a	▼	10:58a	▼	1:18p	2:23p	▼	3:58p	5:23p	6:48p	8:12p	▼	9:13p	9:53p	12:18a
		Depart	10:15a				1:30p			4:10p			8:15p				
RSV	Roseville	Depart	@10:45a				@2:00p			@4:40p			8:38p				
RLN	Rocklin	Depart	@11:00a				@2:15p			@4:55p			8:46p				
ARN	Auburn/Conheim	Depart	@11:25a				@2:30p			@5:20p			9:23p				
COX	Colfax	Arrive	@11:40a				@2:45p			@5:35p							