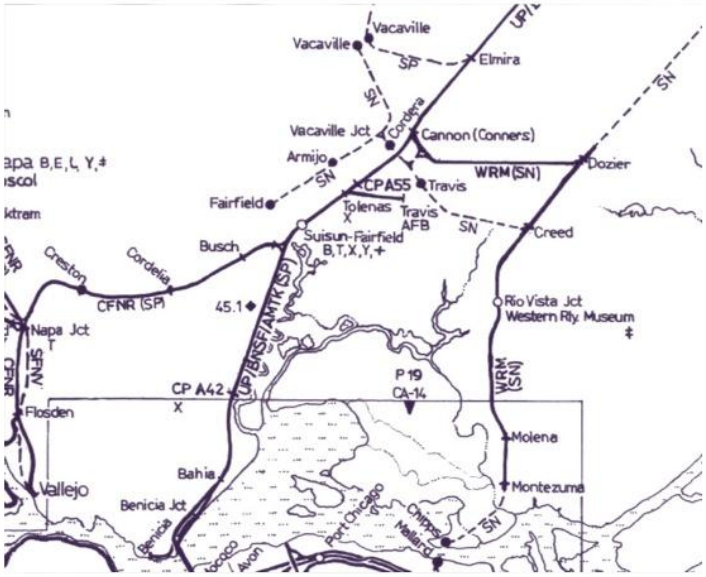
# Solano Rail Facilities Plan Update

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DRAFT

# FINAL PLAN

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# INTRODUCTION

The consultant team for the Solano Rail Facilities Plan Update 2015 were 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 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 ten-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 RSB's 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 (RSBs) 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**
Short line:
**California Northern Railroad**
**Mare Island Rail Service**
**Napa Valley Railroad**

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

### 1.2.1 Class I:

**Union Pacific Railroad**

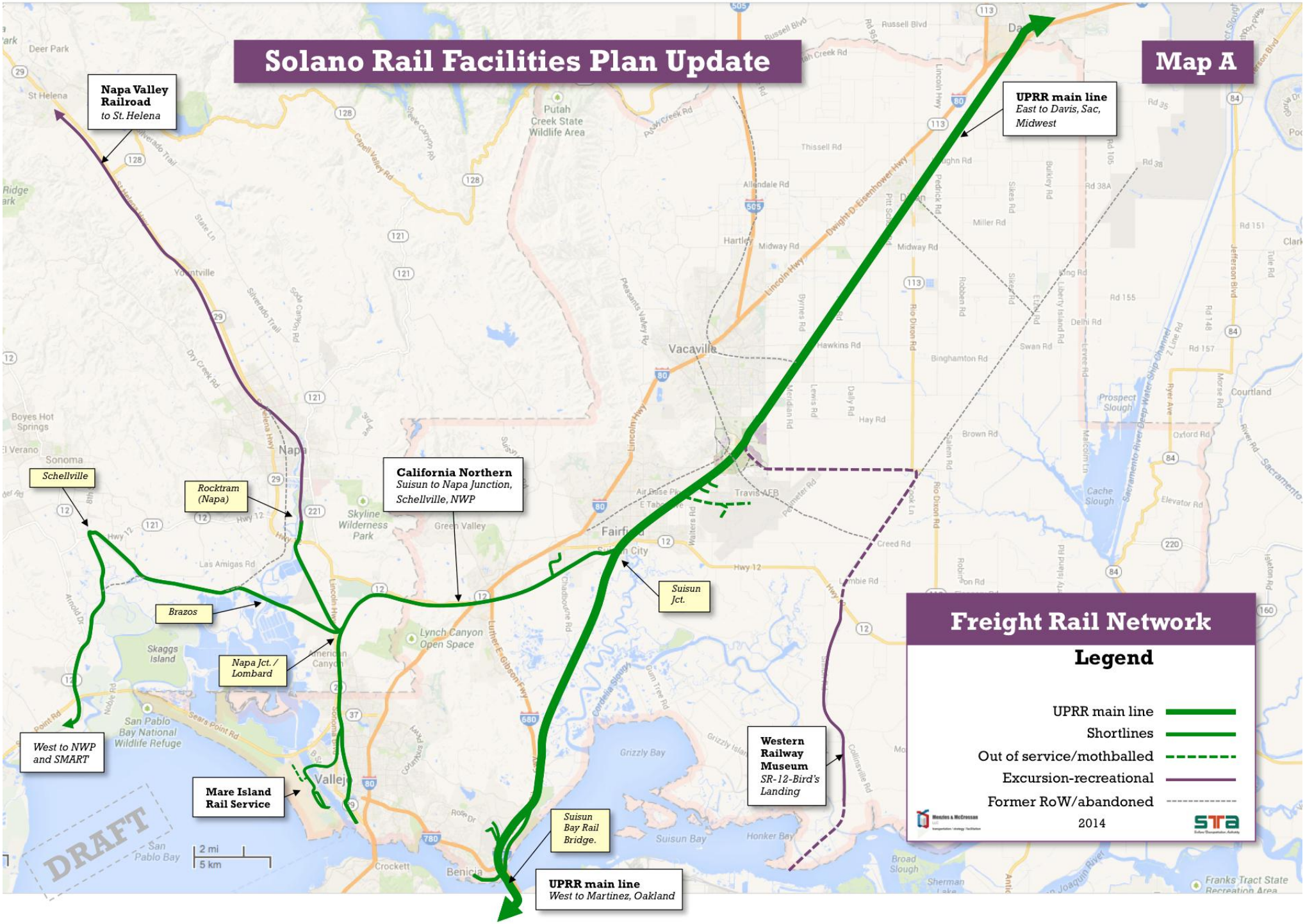
Union Pacific Railroad (UP) provides the majority of freight rail service in Solano County, both in terms of traffic volume and miles of rail line (41 out of 55 main line track miles). Headquartered in Omaha, Nebraska, UP's rail network extends to 23 states. Construction of today's route through Solano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

From the south, UP's route through Solano County begins, at the Solano/Contra Costa county line in the middle of the Carquinez Strait. UP 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 UP 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 descends from the bridge much more steeply and also provides access to the Benicia Industrial Park, AmPorts, and Valero refinery. The route extends along the eastern edge of Benicia and serves major industries at the Benicia Industrial Park, AmPorts automotive marine terminal, and the Valero refinery.

From Benicia, the UP 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 UP route passes by the Tolenas Industrial Park, site of 8 current and 2 former rail served businesses.


Solano Rail Facilities Plan Update
Map A
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 Rail Service
Western Railway Museum
SR-12-Bird's Landing
Suisun Bay Rail Bridge.
UPRR main line
West to Martinez, Oakland
DRAFT
2 mi
5 km
Freight Rail Network
Legend
UPRR main line
Shortlines
Out of service/mothballed
Excursion-recreational
Former RoW/abandoned
2014

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, the UP has 19 rural at-grade crossings, all equipped with active warning devices and gates.

### 1.2.2 Short lines

**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 the UP), 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 Vallejo across 20 at-grade crossings and through a residential area, to the former General Mills site, which is proposed for future industrial development. This line also includes the junction with Mare Island Rail Service.

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 UP.

**Mare Island Rail Service**

Mare Island Rail Service (MIRS) operates approximately 5 route miles from the City of Vallejo, across the Mare Island Strait on a lift bridge (shared with auto traffic) and on Mare Island itself, on 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 access various spur tracks.

Via agreements with other railroads, UP, CFNR, and MIRS are able to provide service 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 UP through Solano County.

**Note:** Via industry-standard protocols and agreements with other railroads, UP, CFNR, MIRS, and NVRR are able to provide service to nearly any rail-served shipper in the US, Canada, or Mexico.

## 1.3 RAIL SERVED BUSINESS (RSB) FACILITIES

### 1.3.1 How Rail Served Businesses (RSB) 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 ten-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 moves 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 in one location (a switching yard) into sufficiently large groups to 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.

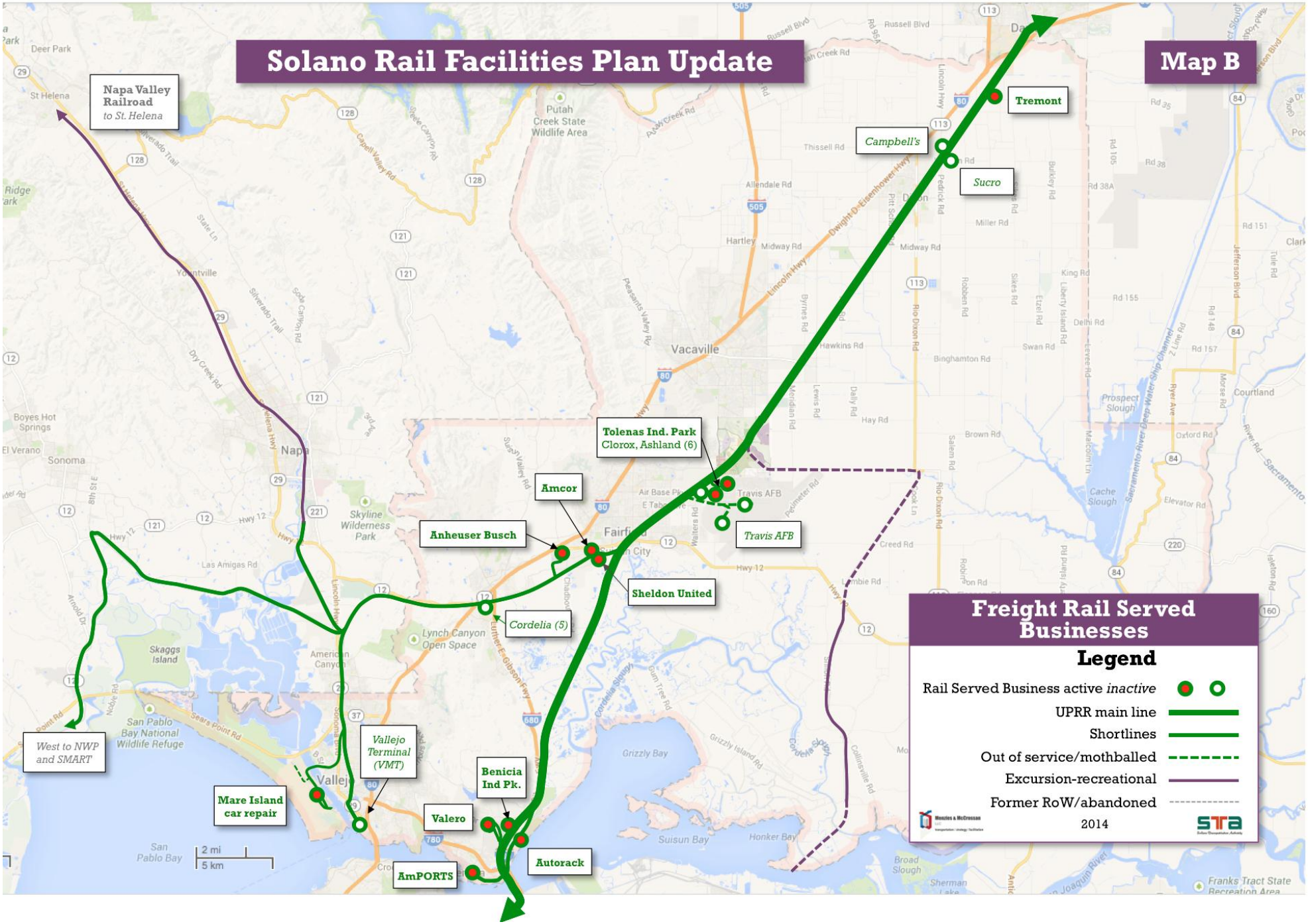

Solano Rail Facilities Plan Update
Map B
Napa Valley Railroad
to St. Helena
Tremont
Campbell's
Sucro
Tolenas Ind. Park
Clorox, Ashland (6)
Amcor
Anheuser Busch
Sheldon United
Travis AFB
Cordelia (5)
Vallejo Terminal (VMT)
Benicia Ind Pk.
Valero
Autorack
AmPORTS
Mare Island car repair
West to NWP and SMART
Freight Rail Served Businesses
Legend
Rail Served Business active inactive
UPRR main line
Shortlines
Out of service/mothballed
Excursion-recreational
Former RoW/abandoned
2014
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 at 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 5 below.

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.

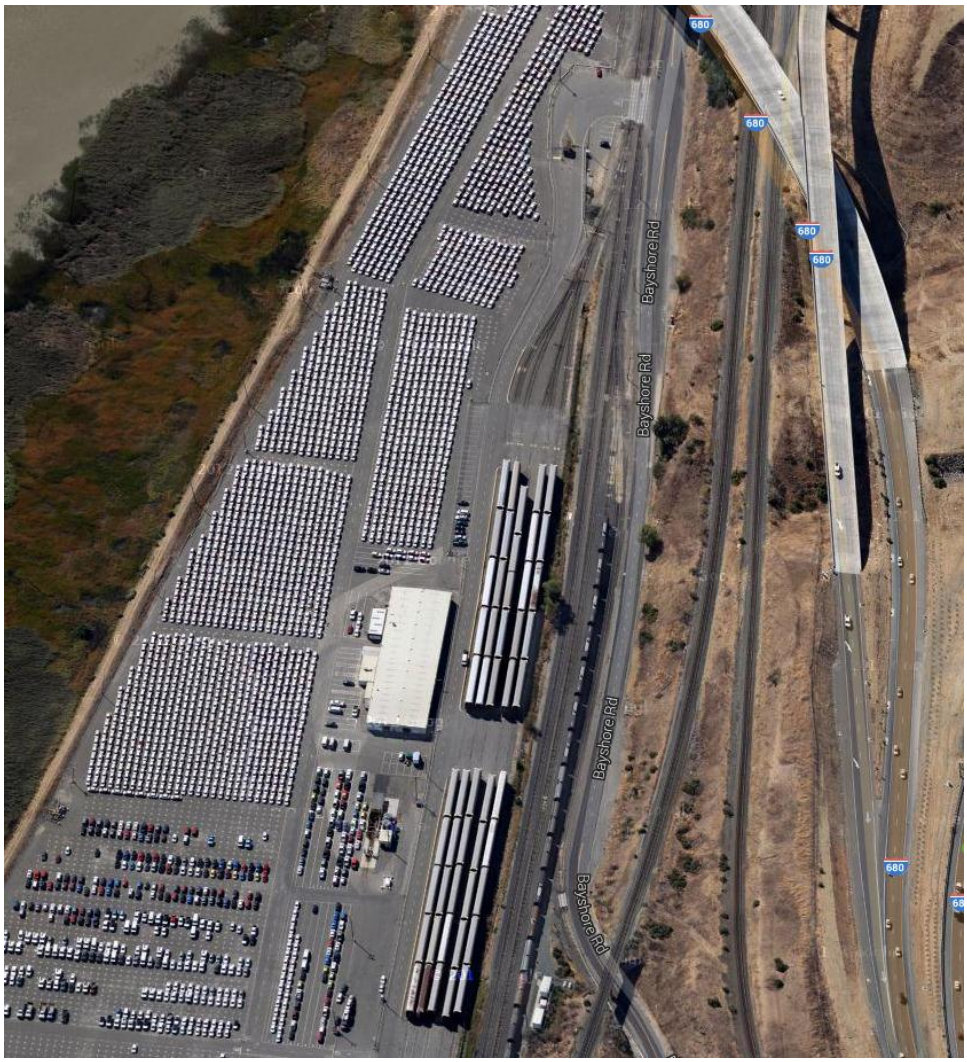
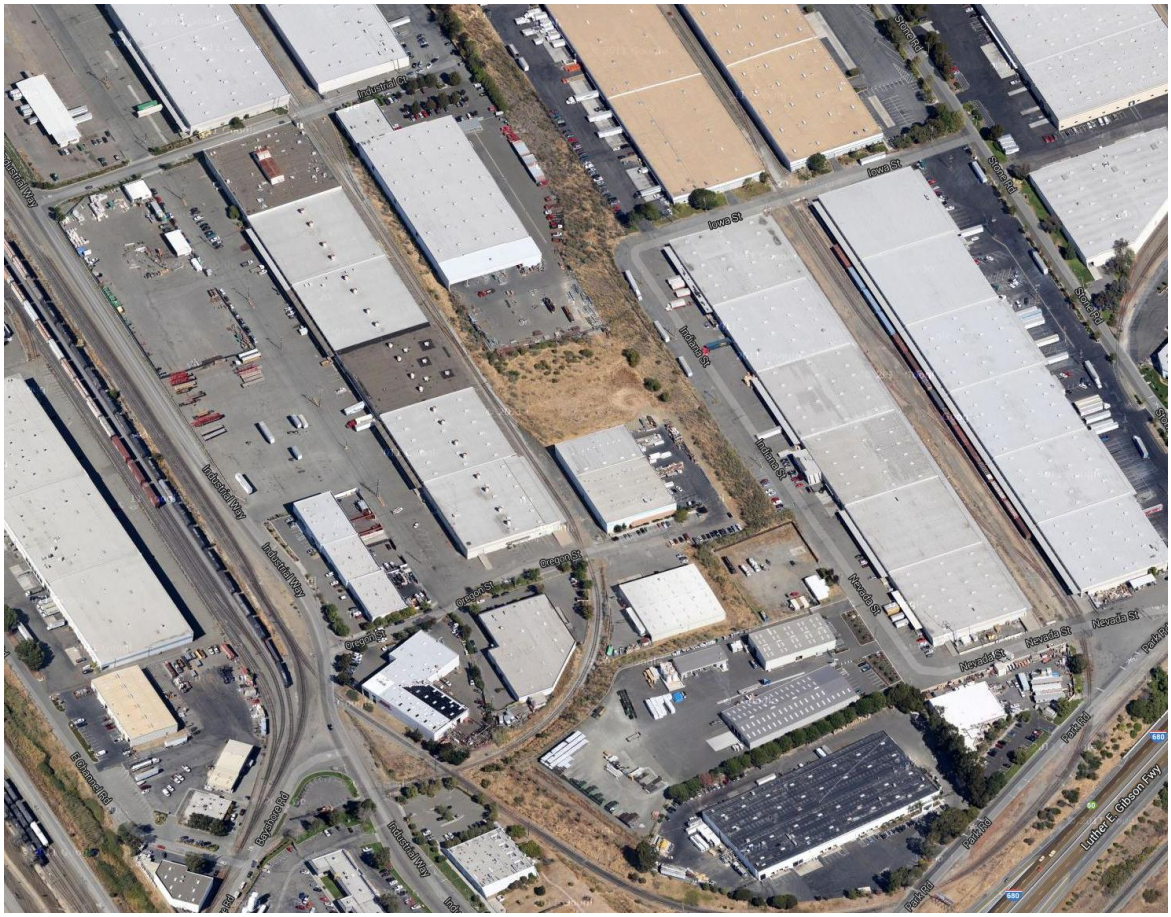



Image: Google 2014

**Benicia Industrial Park**

Benicia Industrial Park caters for distribution and transloading needs for several firms, mainly in 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.


Industrial Way
Industrial Way
Industrial Way

**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.

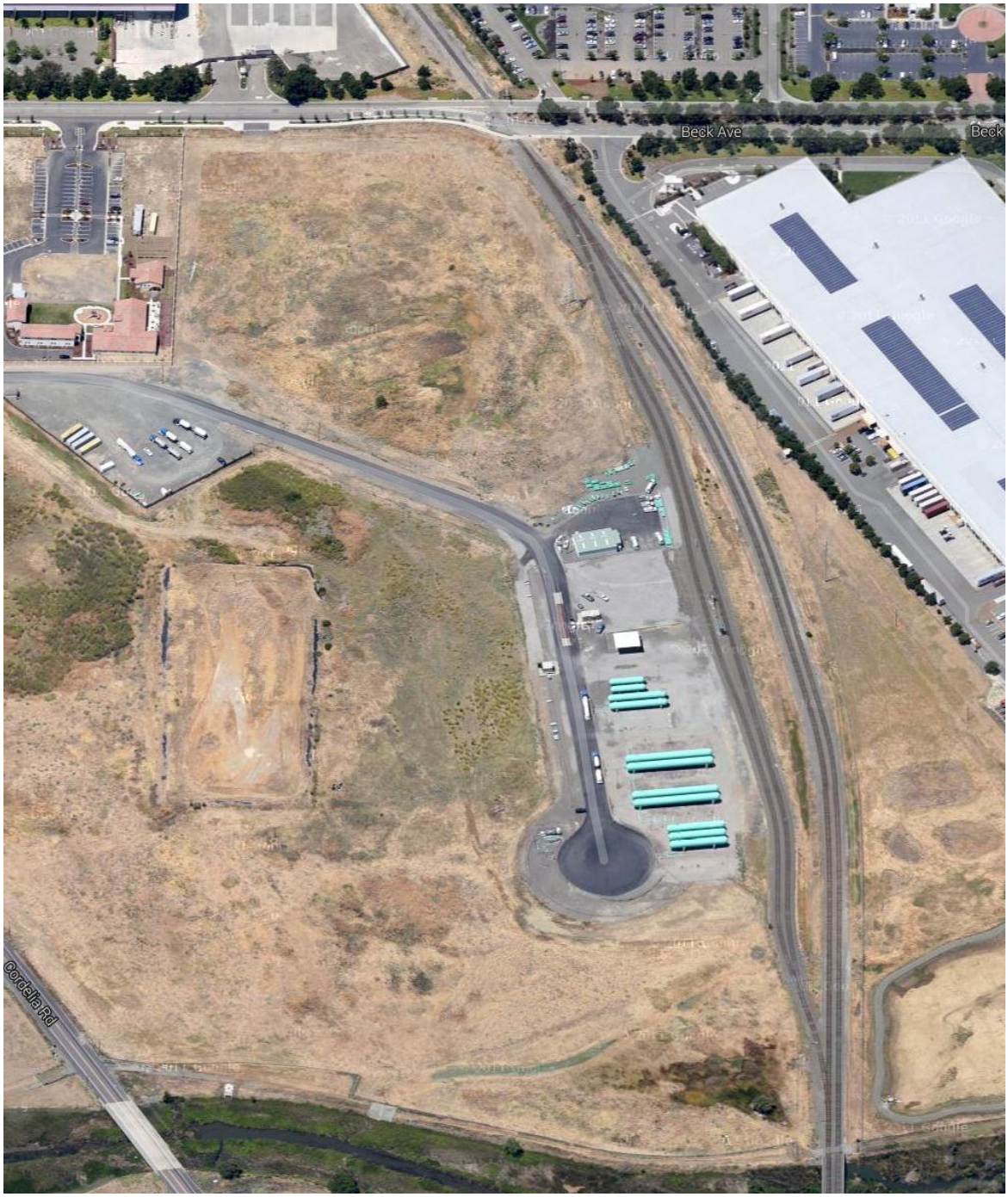



Image: Google 2014

**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, and
- 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 via boxcar 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.

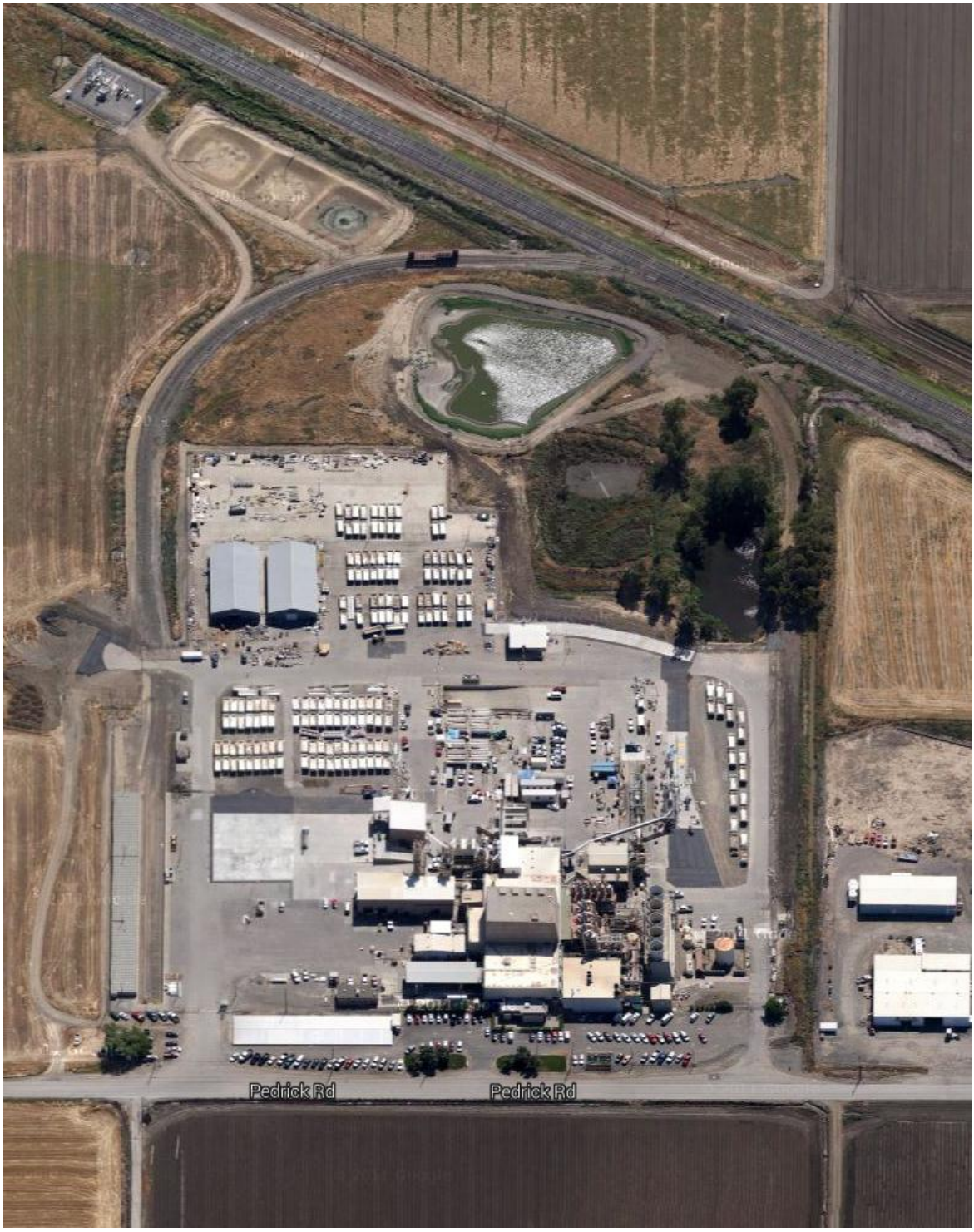



Image: Google 2014

**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. Updated data from California Northern will also be included in the final document.

### 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 UP 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 Short lines

**California Northern Railroad**

California Northern railroad (CFNR) serves a host of industries west of Fairfield, including connections with other carriers: the Northwestern Pacific Railroad, 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; UP receives from the originating shippers or forwards them to their destinations.

**Mare Island Rail Service: Alstom**

While not a major shipper, Alstom is one of the few customers 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). They are served by Mare Island Rail Service, which 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.

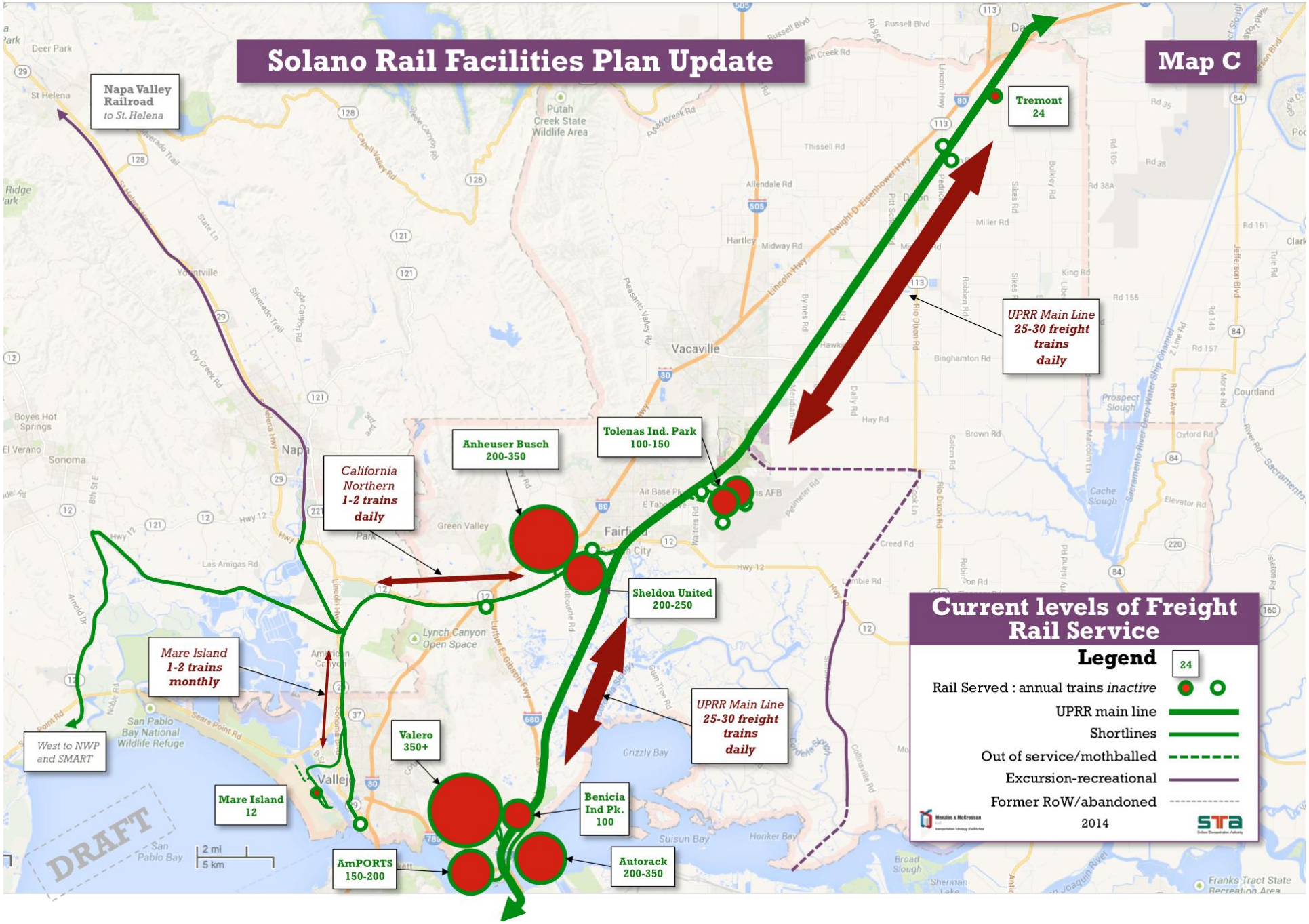
**Figure 2 Estimated Current Level Of Regular Freight Service to RSBs**

| 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** |

(Note these have been aggregated up from daily/weekly/several times per week service to produce annual totals).

# Solano Rail Facilities Plan Update

## Map C



## 1.6 FUTURE DEMAND FOR RAIL SERVICE

### 1.6.1 Key Rail Commodities in Solano and Trends

#### *1.6.1.1 Existing RSBs*

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 ten-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. As of summer 2014 there was no CBR being transported within the County*.

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.

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 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 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 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 be to perform a routing analysis for CBR that would consider 27 safety and security factors and select a route based on findings

[2] Data in the plan update as of March 2015
[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

*Note:*

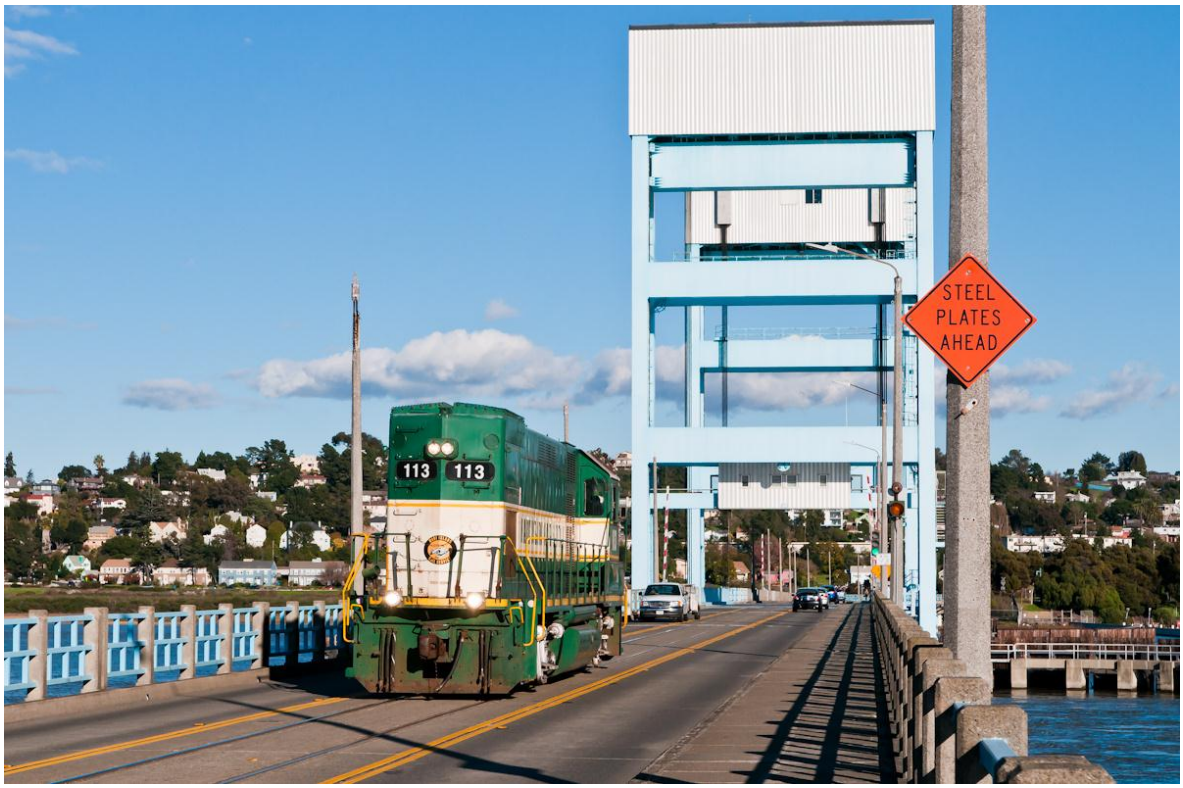
*For commercial confidentiality and practical reasons, the final Solano Rail Facilities Plan Update does not include specific carload counts or operational patterns to specific customers. Both are considered proprietary information, can change at short notice and are subject to the vagaries of the shipper's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

### 1.6.2 Former Rail Served Business (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.



***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 side western side of the base, crossing at Walters Rd., but the connection with the 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 liquids (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.

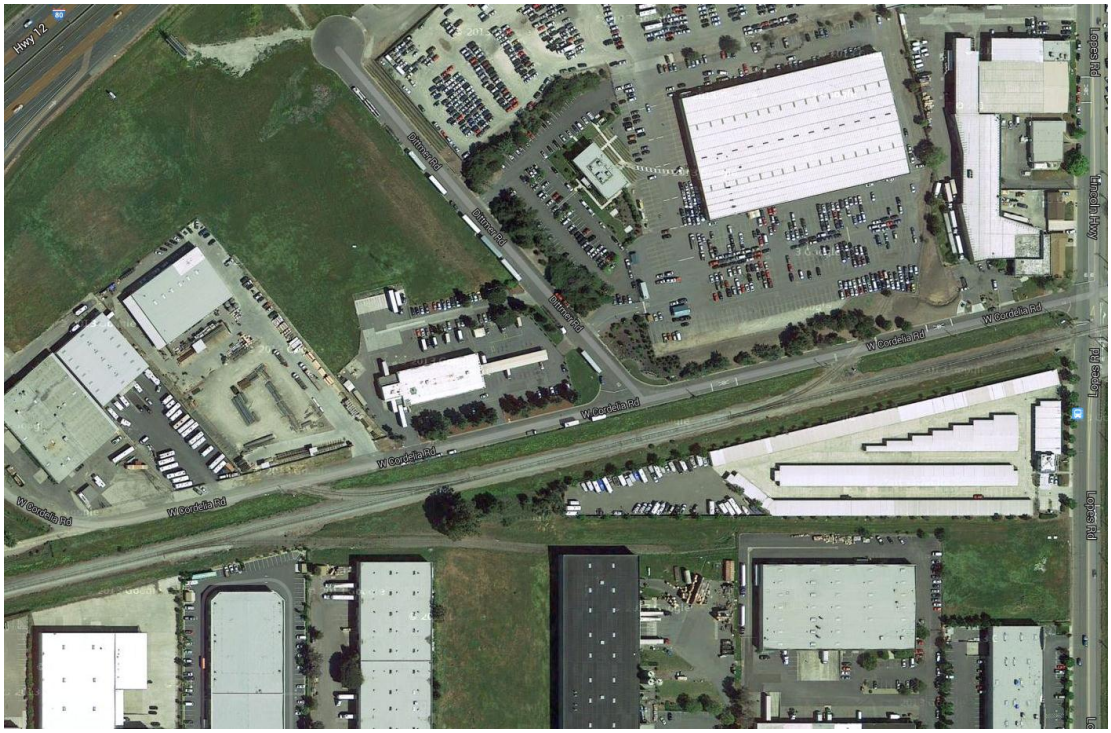
Several decades ago, additional rail service to the base was made via the former Sacramento Northern route (note on by the Western Railway Museum, as described in this report), crossing the North Gate road, which still has a live connection to the UP main line. The consultant is in ongoing discussions 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 rail served businesses.




***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 the property. 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 8,200 carloads annually. This would equate to at least twice weekly service depending on demand, a substantial boost to the viability of this segment of the local rail network, but 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.

### 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 UP 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 UP'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 or Mare Island Rail Service) 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 8,000 annual railcars outbound (inbound materials would arrive by ship). The project has not received discretionary approval from the City of Vallejo as of the date of this report.

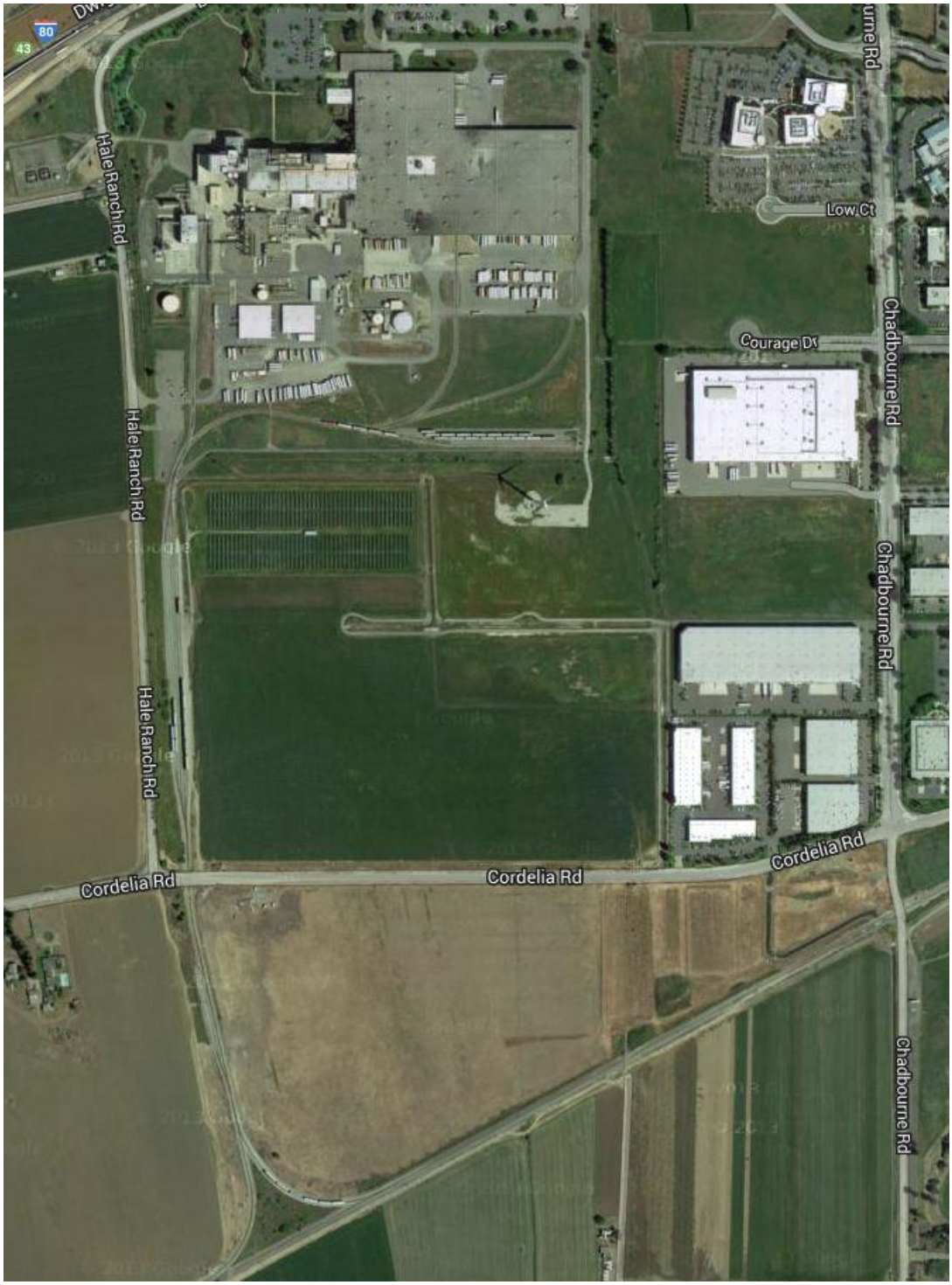
***2) Fairfield General Plan Areas 6 A and 6B***

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 6 A 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 supported industrial uses. Solano Economic Development Commission (EDC) has considered the potential for a 700-acre area (currently used for agriculture) northeast of Dixon being zoned to support agricultural-related industries. 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.

# Solano Rail Facilities Plan Update

## Map D

## 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 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 Short-Line Facilities:

California Northern currently interchanges around 24,000 cars annually* with UP: this is less than half of the level of the mid-1990s 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 project, which is forecasting 30,000 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:

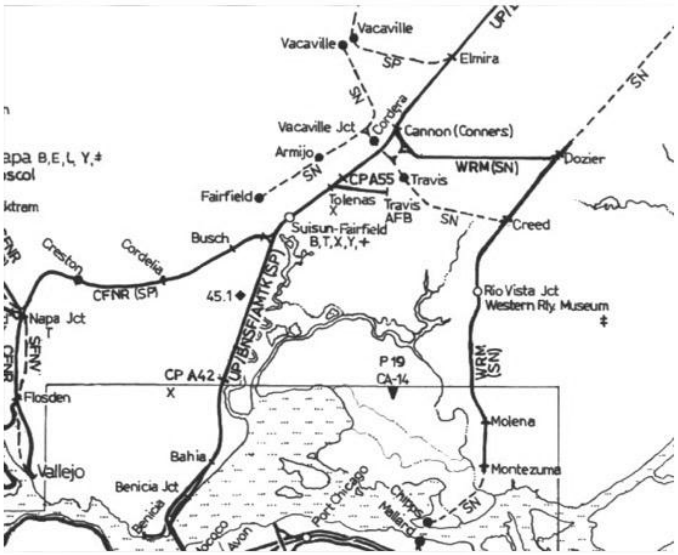
Our review of current capacity of the RSB-level and utilization based on multiple 2014 local observation/site visits shows the current utilization of private sidings is generally in the 30- 60% range). The former RSBs identified in this document who become rail shippers again are unlikely to generate 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
Benicia Ind Pk.
Mare Island car repair
Valero
Autorack
Vallejo
VMT project: grade crossing congestion
AmPORTS
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
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 ten-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 Appendix B.

## 2.3 STATION LOCATIONS

### 2.3.1 Current Solano Passenger Rail Service

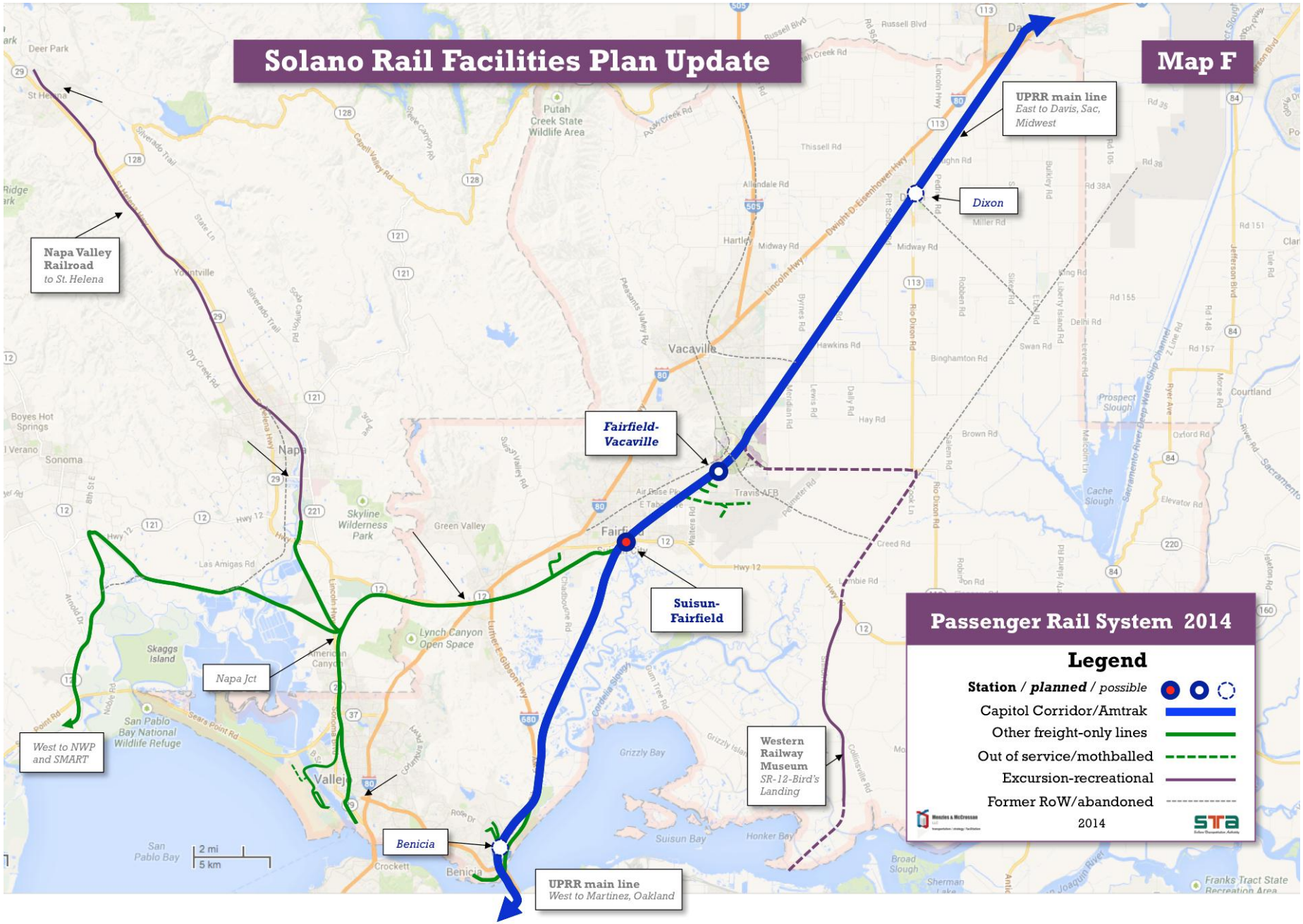
(Exhibit A Map F)

#### *2.3.1.1 Capitol Corridor Service*

Currently there is one station with regular passenger service in the county (see Exhibit A), 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, with service as follows (Fig 4):

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

## Map F: Solano 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 Exhibit X 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 ticket vending machines available during opening hours.

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 the morning commute. 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 and 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 Solano Express 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. Solano Express Route 90 connects the station with teh 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 Appendix A.

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 Exhibit B.

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 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 the transit access connections section of the memorandum). 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 in Exhibit C 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 a 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 (see appendix B for the original documentation).

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 exhibit X), 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 describes the City's concept for an A Street undercrossing.

Figure 8 Dixon A Street undercrossing concept

### 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 Chapter 5 below). 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. However for comparison, the present-day ridership by station is shown alongside the similar-year forecast made in 1995. The 1995 plan made some assumptions about service frequency that differ from actual provision.

**Figure 9 Current Ridership vs. 1995 Plan Projection**

*INSERT TABLE OF CURRENT vs. 1995 Plan forecast*

### 2.7.2 Current Ridership Summary

Figure X 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

## b. 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)

### 2.7.3 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 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 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*

It is clear from this table that the Fairfield/Vacaville station will initially draw some passengers from the Suisun City /Fairfield station, but that both stations will be viable and continue to meet both the STA and CCJPA station criteria. Future residential growth nearby both stations has a substantial beneficial impact on their adjacent stations' ridership growth.

### 2.7.4 Inter-county ridership

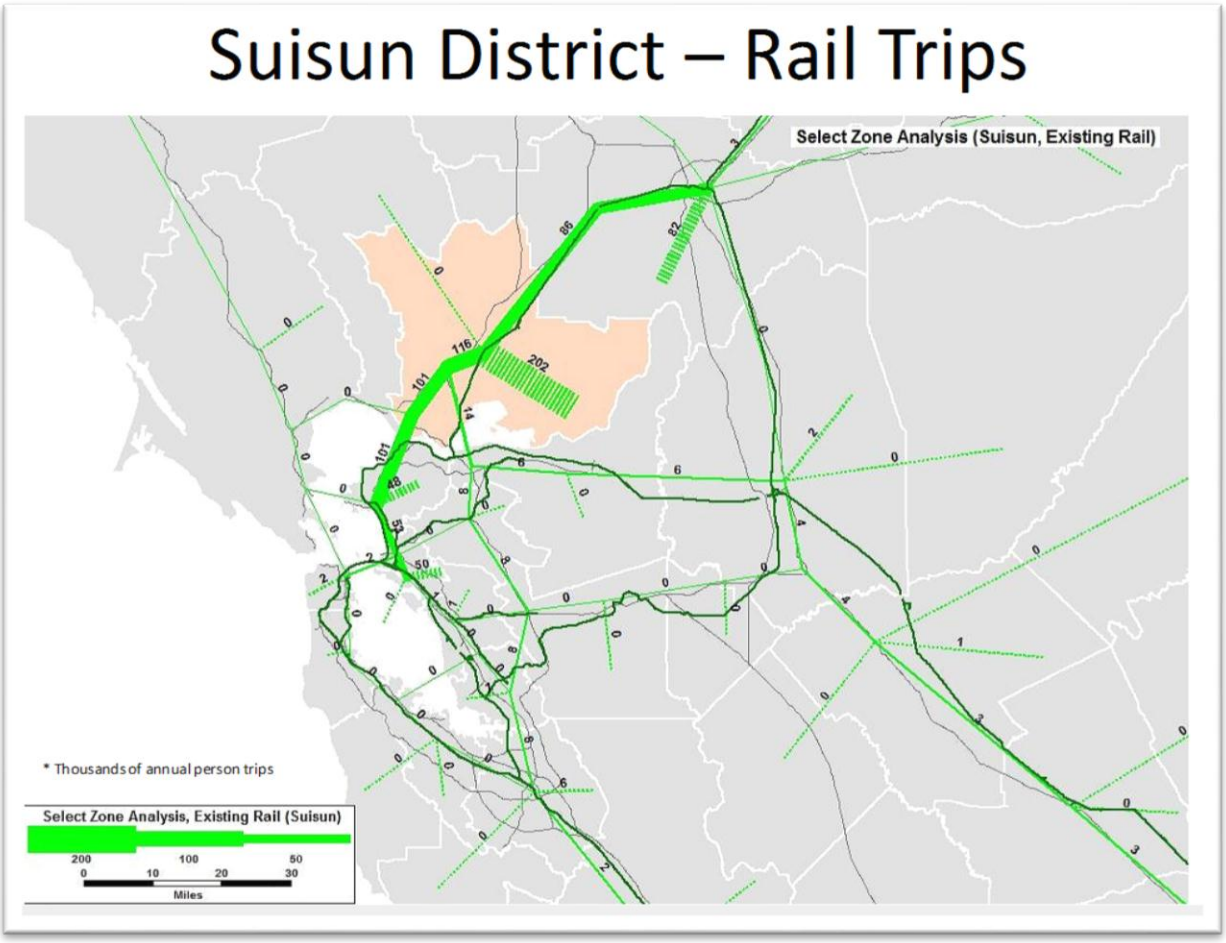
During the latter stages of the preparation of this technical memorandum, the consultant team and STA staff were fortunate to have access to a new state level travel demand modeling effort being led by the California State Transportation Agency (CalSTA).

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 real 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 below.

**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 to 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

**Level of service (2025)**

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.

Exhibit X provides 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.

Exhibit Y 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 but 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 Solano 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 | |

**Figure 14 Capitol Corridor Potential Schedule with FFV and SUI Solano 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 | | |

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

| Train number | | | 720 | 724 | 728 | 732 | 734 | 736 | 738 | 742 | 744 | 746 | 748 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Days of operation* | Mi | | SaSu | SaSu | SaSu | SaSu | SaSu | SaSu | SaSu | SaSu | SaSu | SaSu | 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 stopping in Solano; however, given the current consistent use of Suisun-Fairfield as a station stop 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, with (since the stations would operate as a limited service unstaffed location for the services as others in Northern California currently do, such as Roseville and Chico) with little marginal cost.

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, share with existing commuter/intercity rail): Solano communities would need to assess the benefits of advocating for a stop.

In a positive development for 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 will product will be available and provide an 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 quarter 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 Fairfield and Suisun 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 revenue 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 City/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, Solano Express 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%). 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). 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*

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

### 2.9.1 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 represented in table X-1. 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 in FY2015-16, the new route could start at the Intermodal Station, operate south along Walters Road serving a planned new 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 Section 4.6, 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 the 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.

### 2.9.2 Alternatives to Fixed Route Transit

Providing first mile/last mile connectivity to the station may be better served with a more innovative approach to service provision. Cities such as Denver have "personalized bus service" that travels within select RTD service areas. Trips are accessed through a one-time reservation or through subscription service that connects riders to other bus routes, Park-n-Ride lots, and light rail stations. Services such as these can be deployed as needed, similar to general Dial A Ride services that are typically used to provide paratransit services. While fairly expensive on a per trip basis, they offer the flexibility to be used only when needed by intending passengers. As points of comparison, in FY 2013-14 Rio Vista's deviated fixed route and Dial A Ride service costs approximately $83 per hour, and Dixon's Readi-Ride service costs $88 per hour.

The Solano Transportation Authority and the Alameda County Transportation Commission also offer taxi scrip for several programs operating in their counties (e.g. Emergency Ride Home program and ADA qualified Taxi Scrip program) that could be examined to offer a more flexible operating environment to fixed route transit. These programs can serve dispersed origins and destinations in a fairly cost effective manner. Solano County's ADA qualified taxi scrip program cost an average of $41.46 per ride in FY 2012-13.

While not a direct replacement for fixed route bus service, which provides a reliable "there when you need it" service, they can be deployed prior to the initiation of fixed route bus service and can help determine potential bus needs. As demand for these services grows, these programs can transition into fixed route bus service to meet the needs that may be driven by land use changes near the station.

### 2.9.3 FINANCING AND IMPLEMENTATION

#### *2.9.3.1 Operating Costs: Connecting Transit Service*

Figure 19 provides annual operating cost estimates for the connecting transportation services discussed in Section 2.8.

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.
- For the taxi program option, the per trip cost is based on the FY 2012-13 actual costs per trip for the Intercity Taxi Scrip program. As origin/destination data were not available for this analysis, the Intercity Taxi Scrip program cost provides recent, local data to use for estimating purposes.

  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 station.
- Dial-A-Ride vehicle revenue hours are based on a 12-hour span of service operating 255 weekdays per year.

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.

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 |
| | | | | | | | | | | |
| **Bus Bridge** | | | | | | | | | | |
| 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 |

| Innovative Service Delivery | 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| **Taxi Program** | | | | | | | | | | |
| Annual Passenger Trips | 6,000 | 6,000 | 6,000 | 6,000 | 6,000 | 6,000 | 6,000 | 6,000 | 6,000 | 6,000 |
| Intercity Taxi Cost/Trip | $ 43.98 | $ 45.30 | $ 46.66 | $ 48.06 | $ 49.51 | $ 50.99 | $ 52.52 | $ 54.10 | $ 55.72 | $ 57.39 |
| Estimated Annual Operating Cost | $ 263,909 | $ 271,827 | $ 279,982 | $ 288,381 | $ 297,032 | $ 305,943 | $ 315,122 | $ 324,575 | $ 334,313 | $ 344,342 |
| | | | | | | | | | | |
| **Dial-A-Ride** | | | | | | | | | | |
| Annual Vehicle Revenue Hours | 3,060 | 3,060 | 3,060 | 3,060 | 3,060 | 3,060 | 3,060 | 3,060 | 3,060 | 3,060 |
| Dixon Readi-Ride Cost/Hour | $ 89.73 | $ 91.47 | $ 93.33 | $ 95.20 | $ 98.55 | $ 102.04 | $ 105.55 | $ 109.17 | $ 112.45 | $ 115.82 |
| Estimated Annual Operating Cost | $ 274,574 | $ 279,898 | $ 285,590 | $ 291,312 | $ 301,563 | $ 312,242 | $ 322,983 | $ 334,060 | $ 344,082 | $ 354,404 |

#### 2.9.3.2 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 Solano transportation sales tax measure, new regional bridge tolls, a regional gas tax, high-occupancy toll / express lane fees, benefit assessment districts, and public private partnerships (as a financing mechanism).

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 | 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 | |

| | | |
|---|---|---|
| Efficiency Program | 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. 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 six 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 | A 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 | |

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| Fees (RTIF) | RTIF Expenditure Plan developed by the STA, a total of 5% of the total RTIF revenue 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:<br>• Acquire, improve, or rehabilitate intermodal or rail equipment or facilities, including track, components of track, bridges, yards, buildings and shops;<br>• Refinance outstanding debt incurred for the purposes listed above; and<br>• Develop or establish new intermodal or railroad facilities.<br>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 |

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| | | 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 train 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 source were identified in chapter 2, none are proposed for the throughout 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 will 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 trains 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 his 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 tack 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 year) 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)

The Capitol Corridor Joint Powers Authority 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 sable 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. Order of magnitude costs are difficult to estimate, since there are multiple alternatives, each of which would have distinctly different cost structure. It is conceivable the order of magnitude cost could be less than $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 FRA Class II Track Standards.

The upgrade to FRA Class III Standards which was 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), but has been scheduled to be replaced as part of an Army Corps of Engineers 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 DOT 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 West A Street where an underground pedestrian crossing was proposed to replace the B-street pedestrian crossing and a grade separation was proposed for West A Street.
- 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 planned to be redeveloped after the closing of the Mare Island Naval Shipyard and will need to be monitored for potential future improvements.
- 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 which included Mini Drive in Vallejo, Tennessee Street, Solano Avenue, Curtola Parkway, 5th Street, Sonoma Blvd. in Vallejo, 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.

### 1.1.1 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 in the County of Solano. 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.

Table X-X 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, First 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 Schools 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).

**B. First Street, Dixon, CA**

First Street is a skewed crossing with very 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. First 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 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 RR 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. West 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 daily traffic 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, 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<br>1978 | Truck drove around/thru gate | 462<br>(2003) | 18 | 70 | UPRR | - | Skewed crossing, no median. | - |
| 751246V | Tremont Road | Unincorporated County | 1 | 2005 | Truck-Trailor drove around/thru gate | 3121<br>(2000) | 18 | 70 | UPRR | - | Skewed crossing, no median. | - |
| **751248J** | **Pedrick Road** | **Dixon, CA** | **2** | **1987<br>1976** | **Car drove around/thru gate** | **3146<br>(2008)<br>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<br>2001<br>1980** | **Pedestrian struck while on crossing** | **14247<br>(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<br>1982** | **Pedestrian struck while stopped on tracks** | **5227<br>(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<br>1980<br>1980 | Abandonded car stopped on crossing was struck. | 400<br>(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. | |

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[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. | - |

DRAFT

[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<br>2006<br>2001<br>1999<br>1987<br>1982<br>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<br>2007<br>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<br>1986<br>1986<br>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<br>1979<br>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. | - |

DRAFT

[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). | - |

DRAFT

[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 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

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 STA area. 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 the Solano Passenger Rail Facilities Plan Area 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 major of the rail tracks in STA Passenger Rail Facilities Plan Area are located in the northern portion of the Suisun Marsh. The area is primarily open and natural, and overall there is minimal

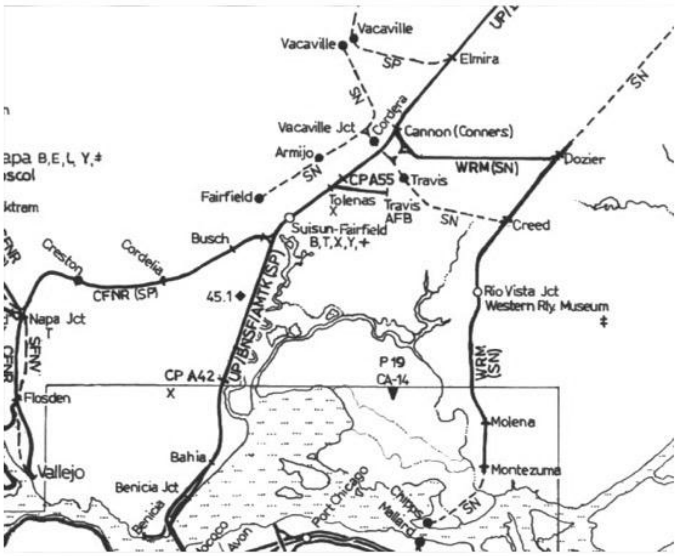
human activity surrounding the tracks in the wetlands. As the rail tracks approach north toward Suisun/Fairfield station in Suisun City, land use becomes urban.

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 the Solano Rail Facilities Plan Area may include petroleum is currently being transferred in pipelines belonging to Kinder Morgan (the pipelines located within the embankment in the Union Pacific right-of-way in the focus area), and destabilization of the railroad embankment 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 X 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 start up 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 start up.**

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

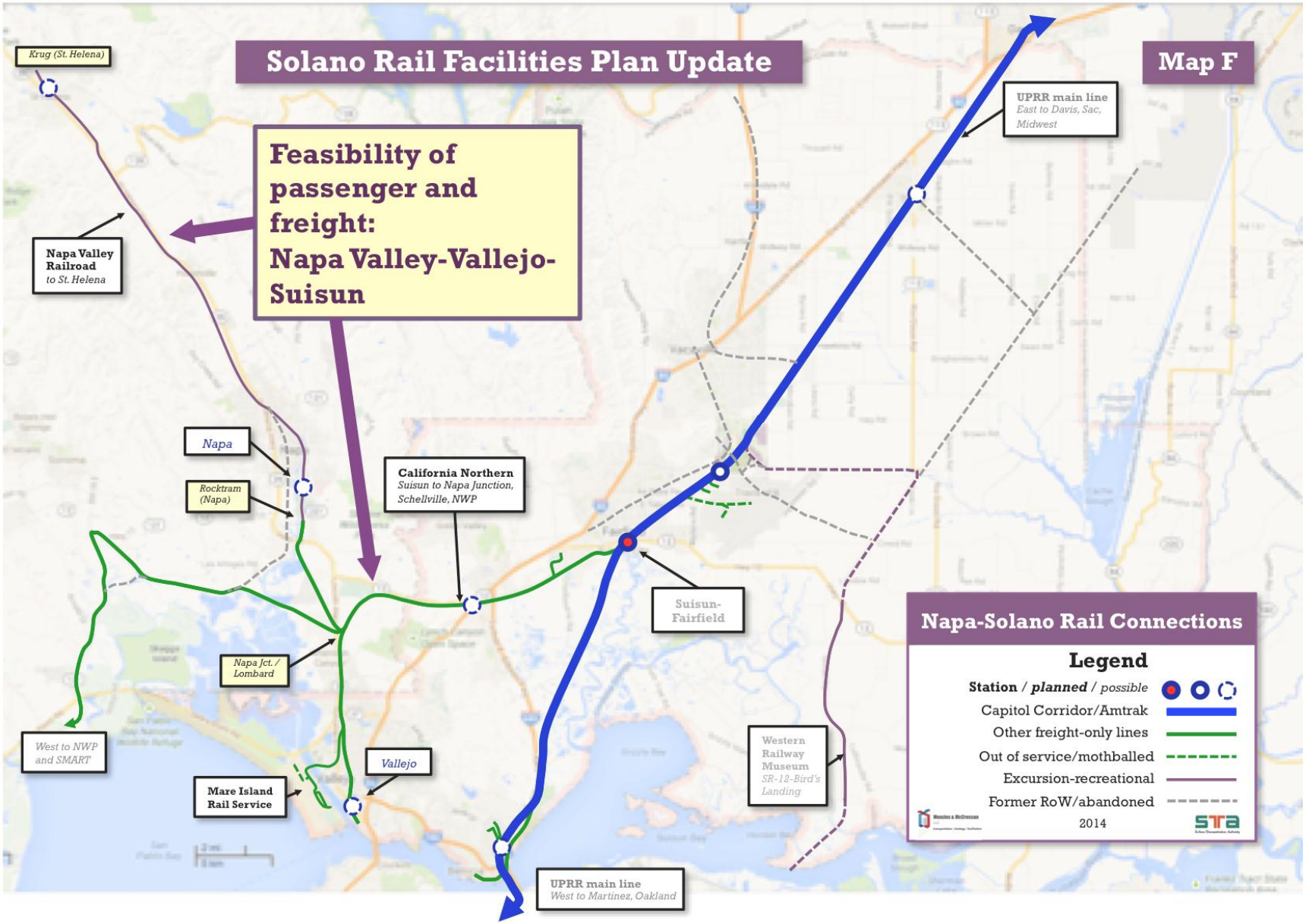
This update to the 2003 study used available resources and data to revisit key elements of the study. Resources were not available to undertake primary engineering assessments or new ridership forecasts. Rather, the focus was to identify what has

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 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] (by comparison
- Ridership on NVRR is 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

[7] Napa CVVB

[8] VNV 2012-13 Survey

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 22 summarizes the three main service segments on the original study, 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).

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

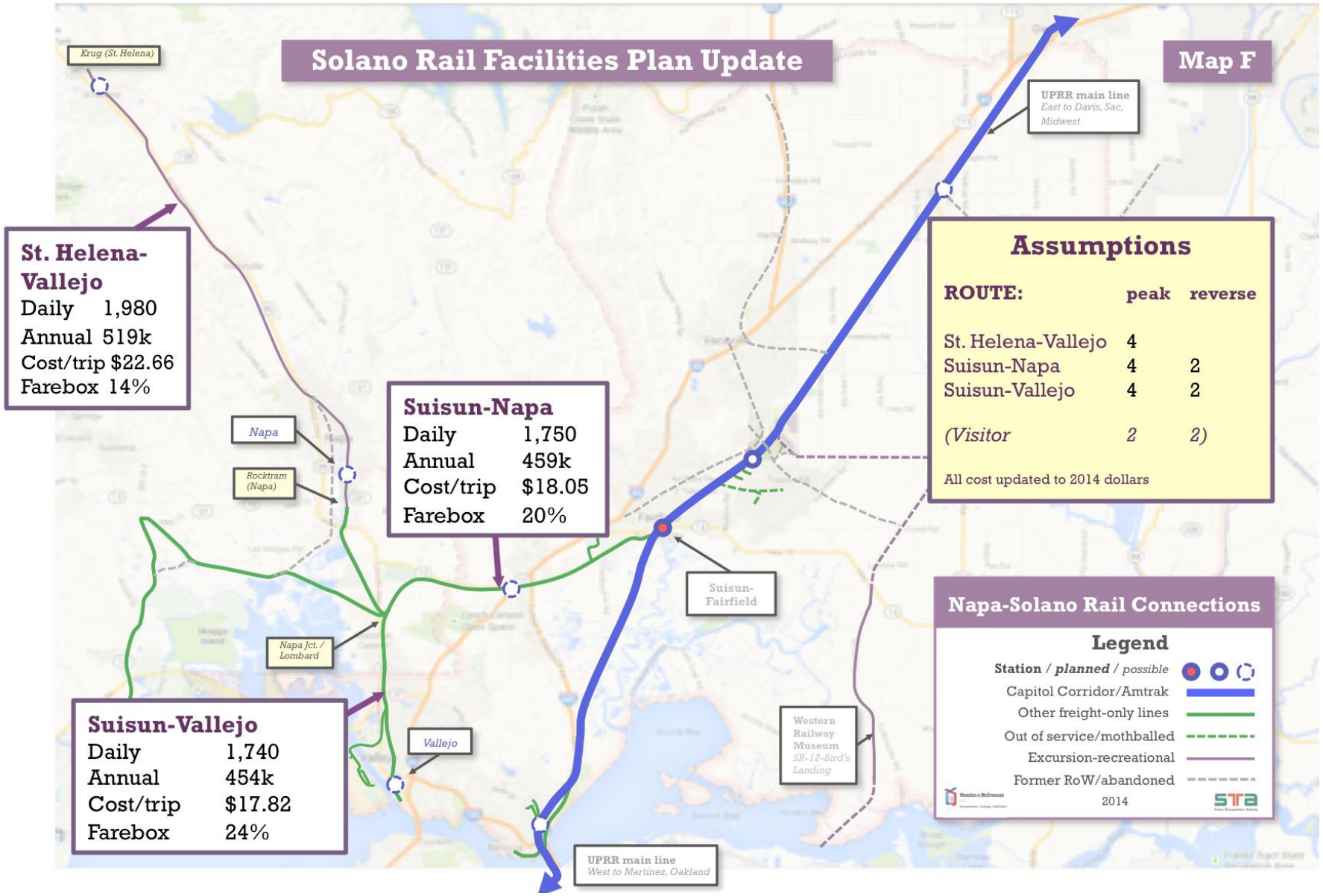



Figure 23 Napa-Solano 2003 Ridership Projections and Updated Costs

## 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 24 summarizes the original capital cost improvements. 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 now a destination and future generator of rail trips.
- Any Krug-Calistoga reopening is even less likely with current landownership
- Operating & maintenance inflation has outpaced even construction costs growth
- Station costs for basic startup have grown (for conventional project delivery)
- South approach to Vallejo Ferry terminal is a possibility to be considered with reverse approach from the Vallejo Marine Terminal (Fig 24).

***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

**Oxbow Bridge**
New structure and station facility

# Vallejo Ferry rail connections: options

Figure 24 Vallejo Ferry Rail Connection Options

# Recap: Napa-Solano Rail Costs (2003 Study)

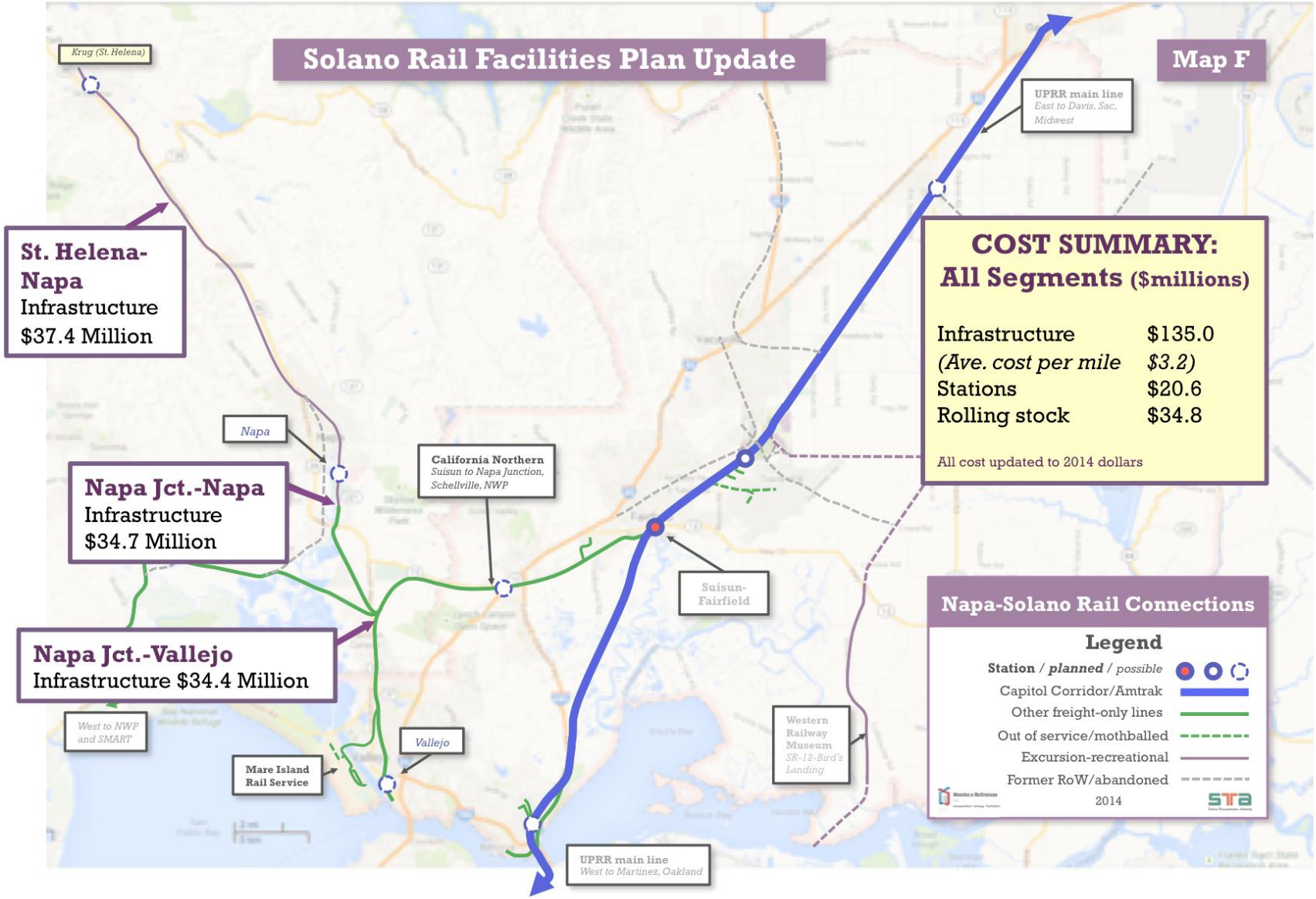



**Figure 25** Napa-Solano Capital Costs Updated

# Major Napa Rail Infrastructure Changes (since 2002)

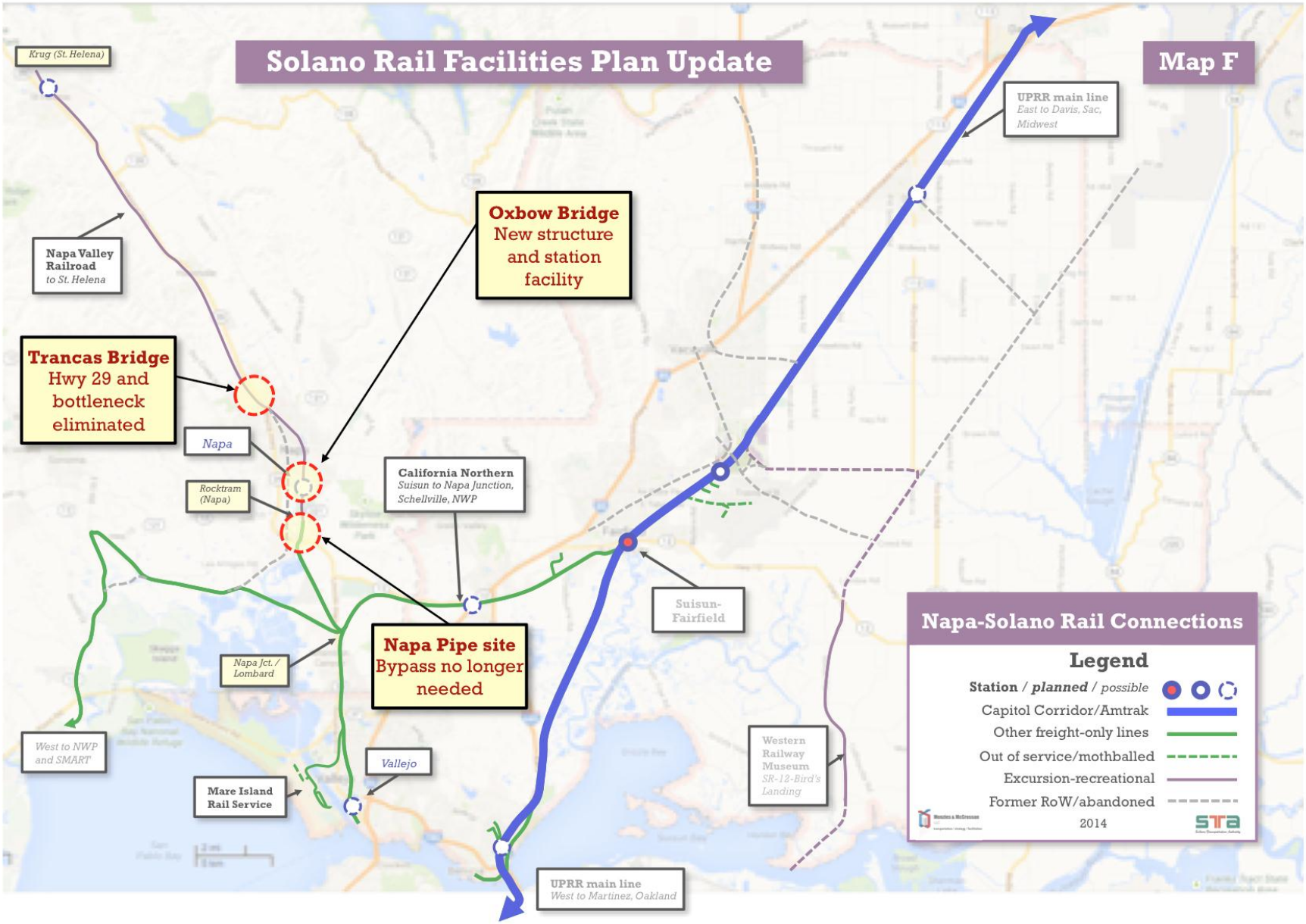



**Figure 26** Napa-Solano major rail Infrastructure Changes

## 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
- 45mph average speeds
- Equipment based on heavy DMU railcars to meet the need for FRA-approved interoperability with freight operations.
- The rail service was at a level 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, 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 start up.
- 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

**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 start up would face viability challenges on all three routes. (Appendix 5 contains the executive summary of the original 2003 study).

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 all of the local public agencies.

Given the current interest by private sector parties to develop a Napa Valley passenger operation services, 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

***Both passenger rail markets are the foundation of the rail corridor's viability***

**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 support denser rail service)

- (via Napa CVB) support 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 50mph passenger operation relatively inexpensive
- Choice of rail equipment drives passenger and freight separation/integration
- Vallejo Ferry Terminal connection requires shared RoW if from the Causeway approach: street running trains are less common and often perceived to generate conflicts with traffic. The northbound approach diverging from the mainline would bring seminar right-of-way issues.
- Funding and Implementation: if private-lead, 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 and Mare Island: freight can be accommodated, is a friend of passenger rail, assures basic maintenance all 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 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 of the order of 10-15 minutes.

- Travel time improvements within Solano County will be at 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 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 a

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 X.

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 o 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 of 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% 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 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 UP. 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.

### 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 (see Exhibit X Map J):

- 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 Verizon, 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 by 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 of 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 currently committed target date for opening. Additional passenger equipment may be necessary to accommodate increased ridership; in conjunction with other agencies, CCJPA has already begun the process of acquiring additional rolling stock (needs confirmation). 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. First 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, 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 UP. 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.

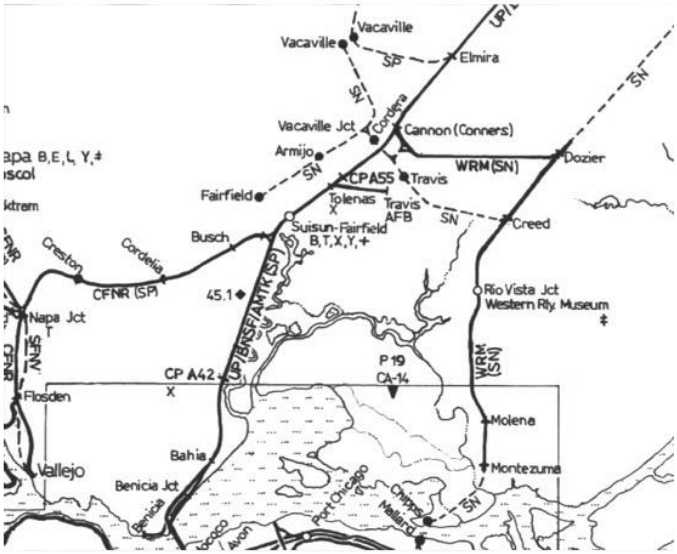
**Figure 27 Solano Rail Facilities Plan Recommendations Summary Table**

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** | Provide 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 | $ 60 | 2016 | Fairfield |
| | **B. First 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** | reduce the frequency of temporary speed restrictions and improve 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 X. 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 perspective 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 ten-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.

- Re establishing rail connections to Travis AFB
- Establishment of rail served businesses is at the five 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 or 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 Auto rack** | ✓ **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 Station Specific Plan Extract

Suisun Dtn Plan Extract

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

Agenda Item 9.E
October 8, 2014

Solano Transportation Authority

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

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**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.

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

## Exhibit B: Summary Of Current Station Stop Criteria

### 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 | |

## Exhibit C: Potential Solano-Specific Station Criteria

**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 |

# 5 APPENDIX: State Rail model background (CalSTA Model in development)

## Market Analysis Purpose

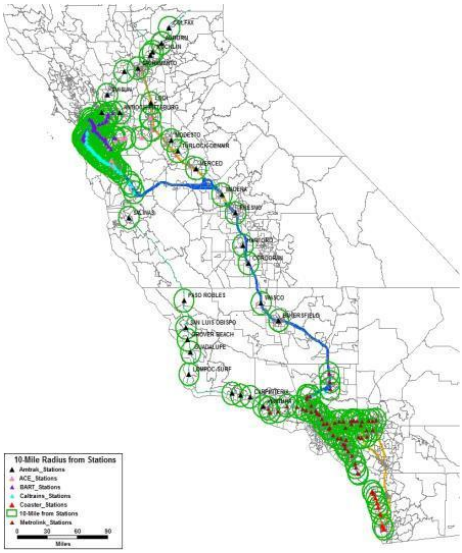
- Identify growth opportunities for increasing rail market share and corresponding rail services
  - Total travel demand (across all modes between origins and destinations)
  - Existing travel patterns for intercity and commuter rail riders
- Design conceptual networks, including identification of options 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

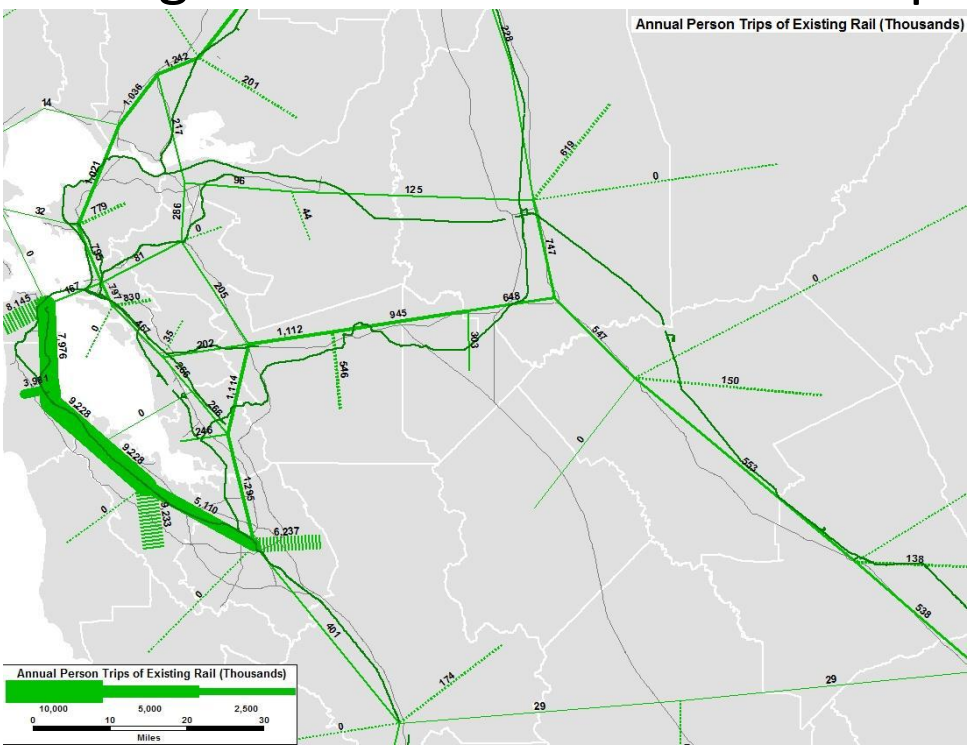
- Aggregate TAZs to Districts
  - Centered around rail station groupings
  - Additional zones to divide non-rail served areas of the state
- O-D matrices by districts for all trips and rail trips




# Rail Stations by District

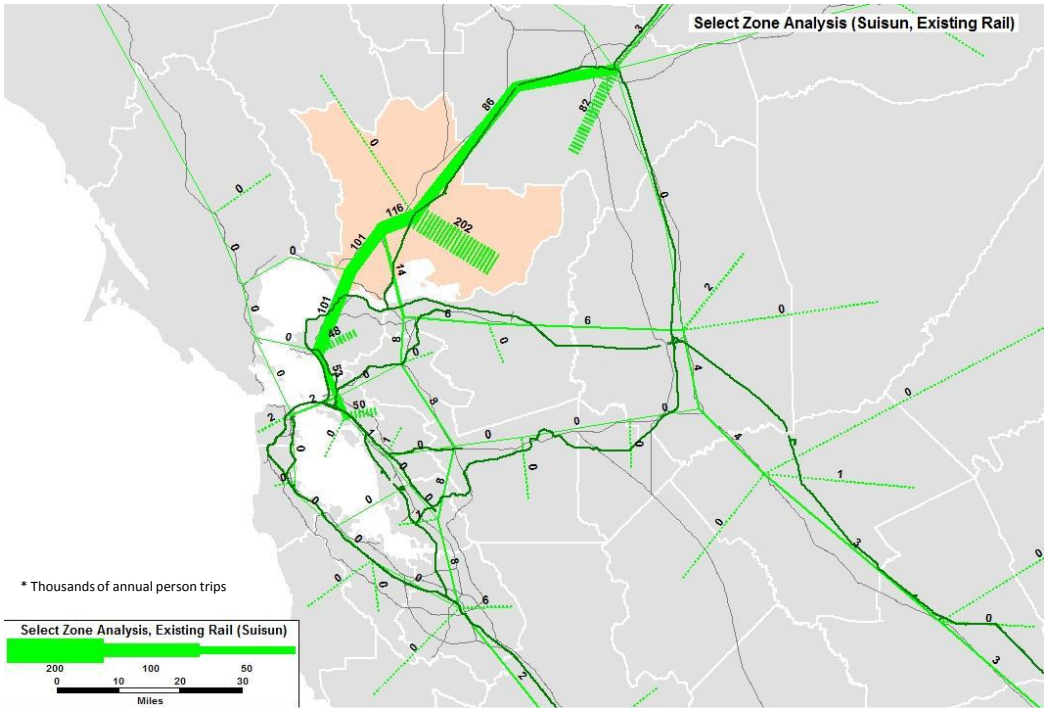
| District Name | Existing Rail Stations |
|---|---|
| San Francisco | San Francisco, 22nd St., Bayshore |
| San Mateo | South San Francisco, San Bruno, Milbrae, Broadway, Burlingame, San Mateo |
| Palo Alto | Mountain View, Hayward Park, Hillsdale, Belmont, San Carlos, Redwood City, Atherton, Menlo 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 |

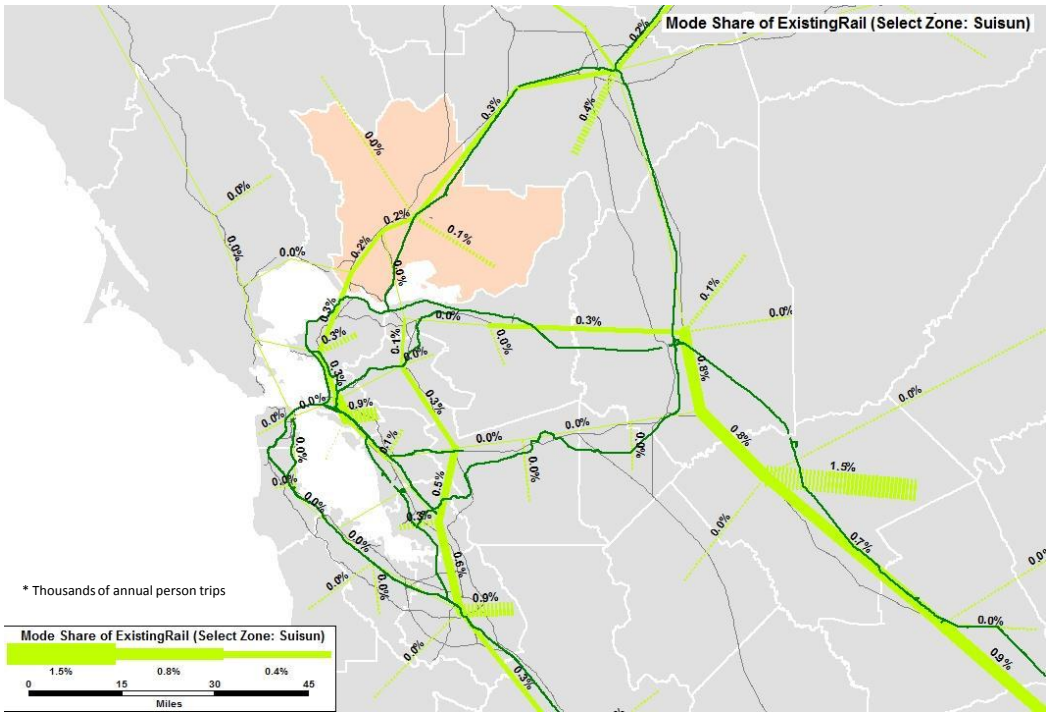
# Existing Interdistrict Rail Travel - Trips




# Existing Rail Travel – Mode Share

# Suisun District – Rail Trips




# Suisun District – Rail Mode Share