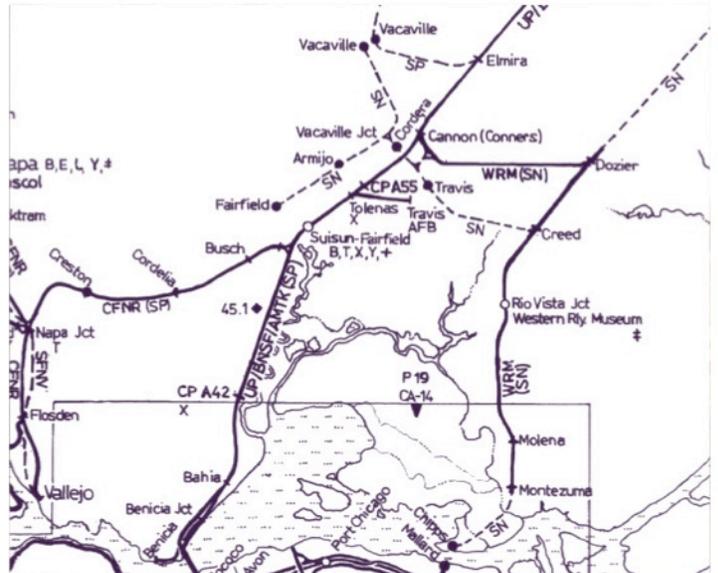




Solano Rail Facilities Plan Update



with



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May 2014

Task 3 Technical Memorandum:

Demand for Freight Rail in Solano

DRAFT

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1 INTRODUCTION

The Solano Rail Facilities Plan Update comprises seven tasks:

Task 1. Budget and Schedule

Task 2. Coordinate with STA and Partnering Agency Staff

Task 3. Demand for Freight Rail

Task 4. Capitol Corridor - Review and Update the 1995 Solano Rail Facilities Plan

Task 5. Rail Infrastructure and Safety (update the 2012 Solano rail crossings study)

Task 6. Napa-Solano Rail Connections (update the 2003 Napa-Solano passenger rail study)

Task 7. Final Solano Rail Facilities Plan Update

This technical memorandum comprises **Task 3**, and 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 any determine the requirements for enhancements or expansion of freight rail capacity in Solano County.

Since the capacity of the core freight rail network is also shared extensively with passenger services in the County, the potential of facility Improvements to meet future demand is not at this stage in the process comprehensive. The future passenger tasks and final plan will include the comprehensive list of improvements. Since there is some overlap with future Task 6 to update the Napa-Solano passenger study, connecting freight rail services to Napa County are also referenced in this document.

The horizon for the freight rail demand task – and for the plan as a whole – is 10 years, i.e. 2024.

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)
- **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.

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):

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.

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. 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 Suisun, 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 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 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.

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 (south of SR-12).

Continuing towards Sacramento, the railroad extends northeasterly through a predominantly agricultural area, along the south edge of Vacaville, through Elmira, and through 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 many rural grade crossings, all equipped with active warning devices and gates.

2.2 Short lines

Short line:

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 Suisun City (the junction with the UP), American Canyon, Lombard (near American Canyon), Napa, and 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 a junction - 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 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.

Short line:

Mare Island Rail Service

Mare Island Rail Service (MIRS) operates approximately 5 route miles from 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.

Short line:

Napa Valley Railroad

The Napa Valley Railroad (NVR) 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 NVR 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 NVR are able to provide service to nearly any rail-served shipper in the US, Canada, or Mexico.

3 RAIL SERVED BUSINESS (RSB) FACILITIES

3.1 How RSBs are typically served

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

3.2 Individual 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.

Figure 1: Solano County Rail Served Businesses (RSBs) Summary 2014 (listed East-West)

RSB Name	Active/ <i>inactive / future</i>	RSB Rail Facility Jurisdiction	Inbound / Outbound Primary	Primary Rail Traffic / Commodity
Tremont Supply Co (Dixon)	✓ active	Solano Co/ Dixon	outbound	ag product
<i>Campbell Soup Supply Co</i>	<i>inactive</i>	<i>Solano Co/ Dixon</i>	outbound	<i>food/bev product</i>
<i>Sucro-Dixon</i>	<i>inactive</i>	<i>Solano Co/ Dixon</i>	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
<i>Tolenas Bus Park Rexam</i>	<i>inactive</i>	<i>Fairfield</i>	inbound	<i>bev container</i>
Travis AFB	<i>inactive</i>	<i>Fairfield</i>	inbound	<i>avgas/DOD</i>
Anheuser Busch	✓ active	Fairfield	inbound	beverage production
Sheldon United Terminal	✓ active	Fairfield	inbound	propane
<i>Amtcor Rigid Plastics</i>	<i>inactive</i>	<i>Fairfield</i>	inbound	<i>plastic raw materials</i>
<i>Jensen Precast Building Systems (fmr Fibrebond)</i>	<i>inactive</i>	<i>Fairfield</i>	<i>n.a.</i>	<i>n.a.</i>
<i>West Cordelia (North bay Auto Auction)</i>	<i>inactive</i>	<i>Fairfield</i>	<i>n.a.</i>	<i>n.a.</i>
<i>West Cordelia (White Cap Construction Supply)</i>	<i>inactive</i>	<i>Fairfield</i>	<i>n.a.</i>	<i>n.a.</i>
<i>West Cordelia (fmr. Glass Pak)</i>	<i>inactive</i>	<i>Fairfield</i>	<i>n.a.</i>	<i>n.a.</i>
<i>West Cordelia (Dependable Plastics)</i>	<i>inactive</i>	<i>Fairfield</i>	<i>n.a.</i>	<i>n.a.</i>
Valero Benicia	✓ active	Benicia	inbound	refined petroleum
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

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.

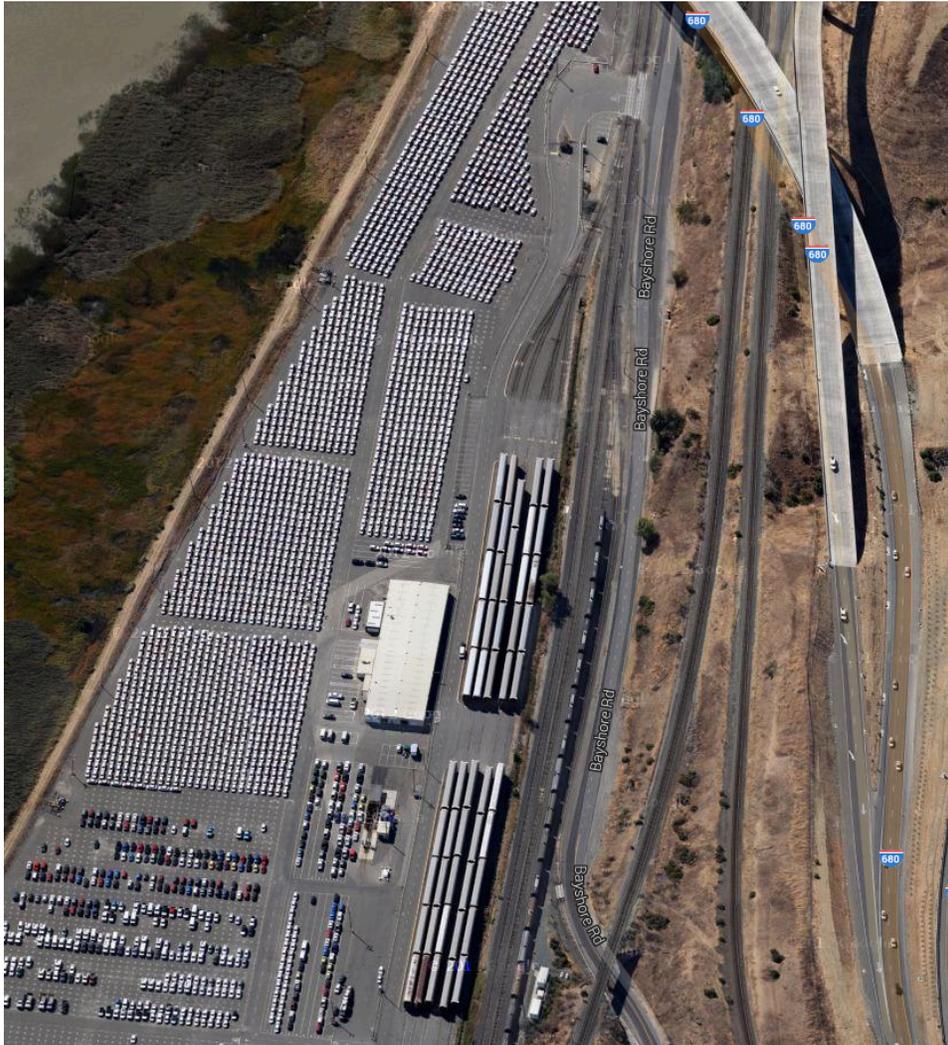


Image: Google 2014

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.

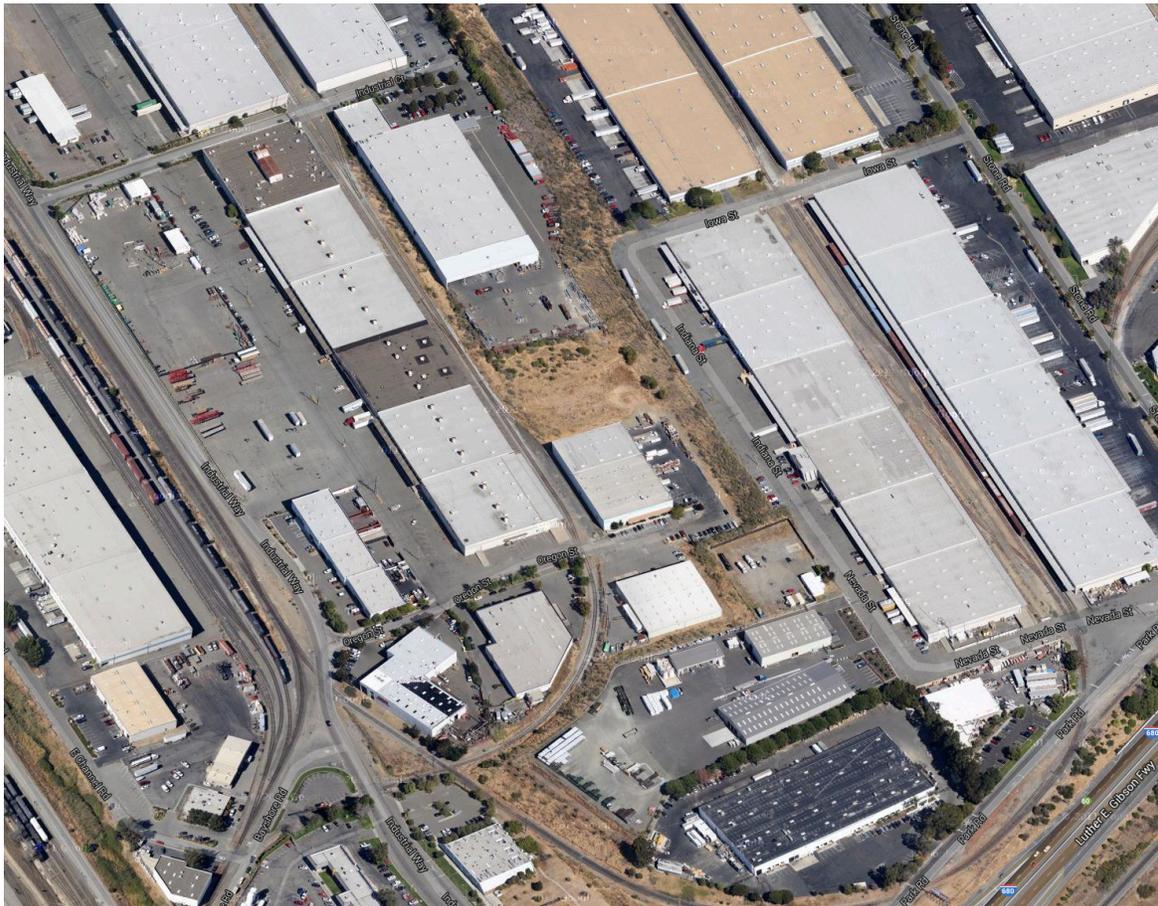


Image: Google 2014

Fairfield: Anheuser Busch

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



Image: Google 2014

Fairfield: Sheldon United

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



Image: Google 2014

Fairfield: Tolenas Industrial Park

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

Rail-served industries at Tolenas include:

- Clorox, which receives inbound cars of raw materials;
- Ball Corporation, which receives inbound raw materials;
- Macro Plastics, which receives plastic pellets in covered hopper cars;
- Ashland Distribution Company, which receives raw materials in tank cars and distributes specialty chemicals;
- Frank-Lin Distillers
- Goodyear Tire, which receives raw materials in covered hopper cars, 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

4 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.

4.1 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.

4.2 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).

5 FUTURE DEMAND FOR RAIL SERVICE

5.1 Key Rail Commodities in Solano and Trends

5.1.1 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 very 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, 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 all formerly imported crude oil. Currently (as of 5/2014) there is 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. All of the proposed CBR is understood to be originating in Canada**.

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). 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 of the County to the refinery, through Dixon, Vacaville, Fairfield, Suisun and Benicia.

Note:

For commercial confidentiality and practical reasons, the final Solano Rail Facilities Plan Update will 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.

5.1.2 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 comprised 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.

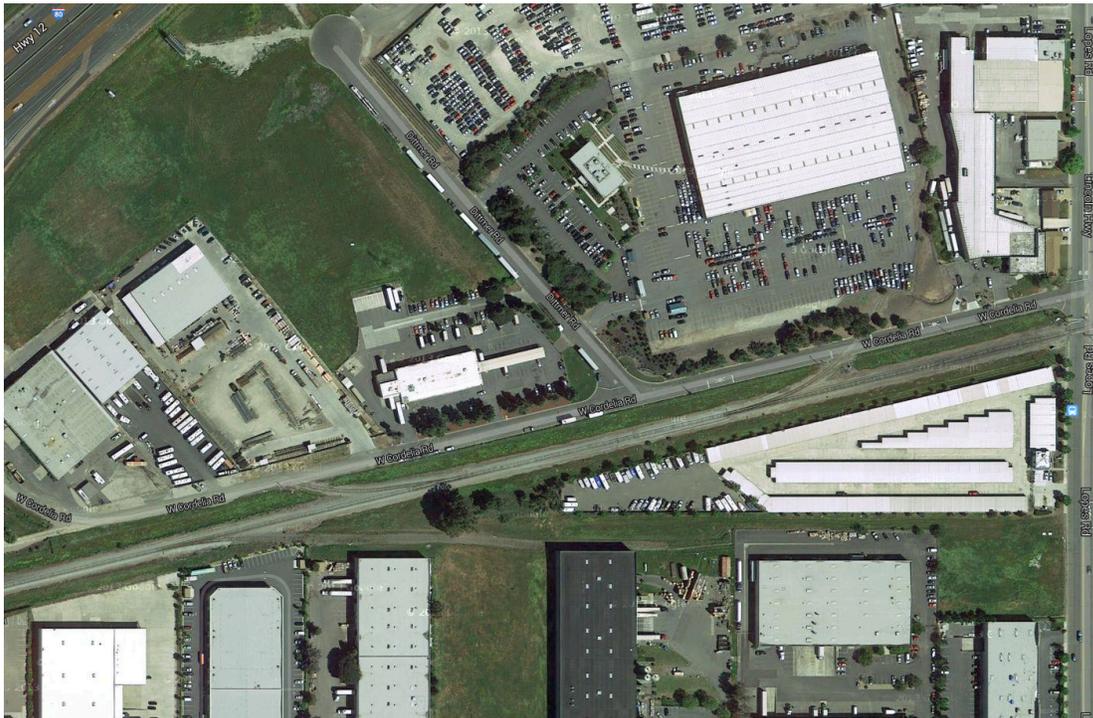
Several decades ago, additional rail service to the base was made via the former Sacramento Northern route (note on by the Western Railway Museum, as described in this report), crossing the North Gate road, which still has a live connection to the UP main line. The consultant is in ongoing discussions 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 is some years since these were rail-served, and not considered very likely, given their current activity profiles, to be returning RSBs.



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 demolished or auctioned-off. Orcem has proposed repurposing the site for receiving raw cement admixture material by ship, processing it, and shipping it out by 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, 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.

5.1.3 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: serve

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 are a major factor in determining whether these sites are ultimately suitable for rail served businesses. With this in mind, only sites that are currently or soon 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 C:

1) Vallejo Marine Terminal (Orcem)

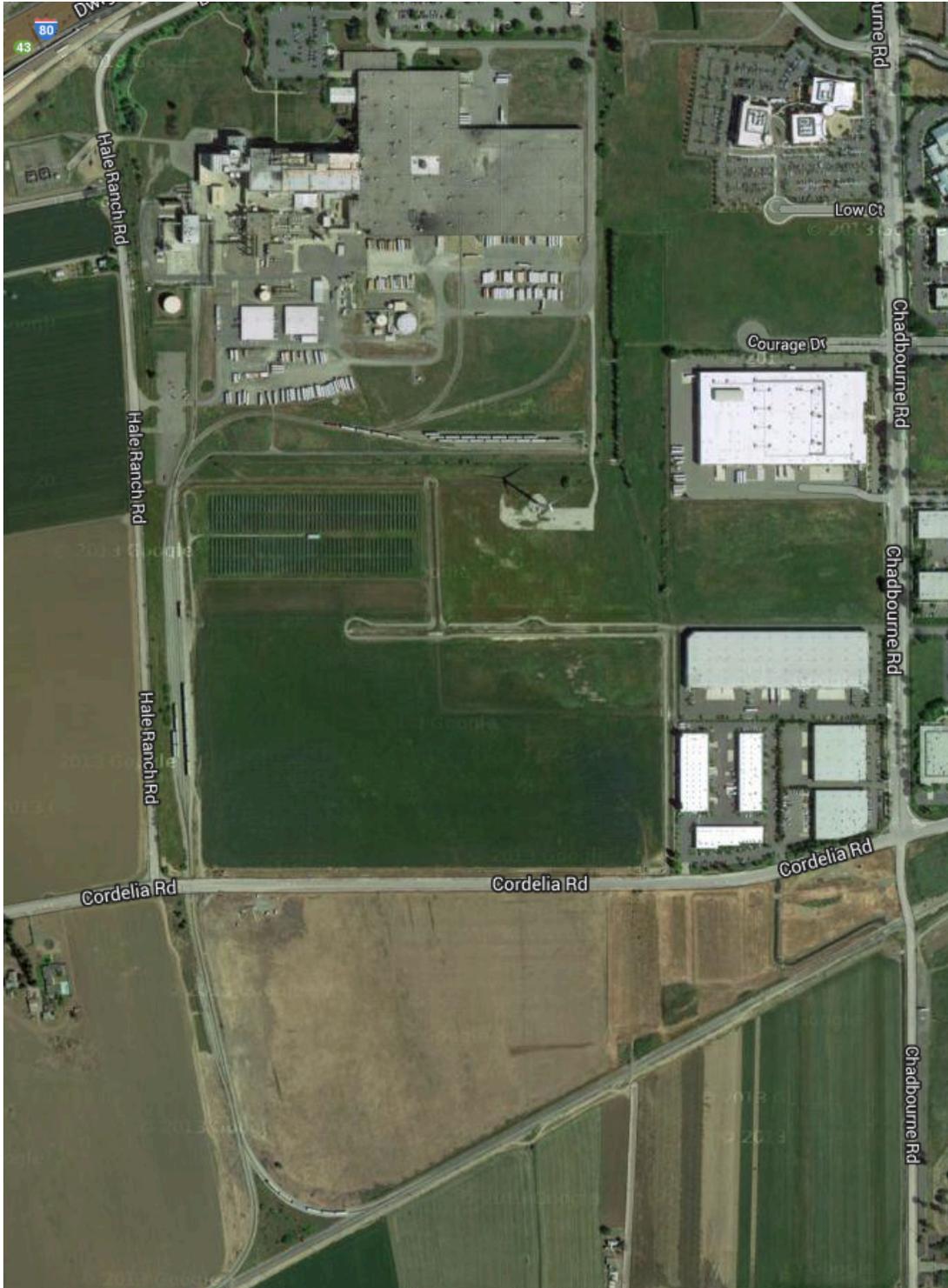
As mentioned, the proposed Orcem Vallejo Marine Terminal facility could be the most well advanced significant new rail served business in Solano County, generating potentially 8,000+ annual railcars outbound (inbound materials would arrive by ship). The project is commencing the environmental review process.

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 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 Bush 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. As yet these are speculative.

6 FREIGHT CAPACITY BOTTLENECKS AND NEEDS

6.1 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 very 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 may have to 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.

6.2 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 very long section with no stations and a single, very 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 likely 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.

This is not a definitive list of all current future bottlenecks: these will be assessed further in the passenger elements of the Plan Update.

Map F provides an overview of these current and potential freight rail network bottlenecks, and will be updated when passenger tasks are complete).

6.3 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 therefore at this stage be regarded as very preliminary conclusions.

6.3.1 The Current Mainline Network:

Infrastructure was built for service levels considerably above current demand – in the pre-2009 Great Recession era, this Subdivision 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. In reality, regular 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's 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 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 in to be designated the unincorporated County east of Dixon

A single medium-sized plant generating say 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 on 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.

6.3.2 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), may yield traffic levels restored to 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.

6.3.3 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	Inbound / Outbound Primary	Primary Rail Traffic / Commodity	Est. RSB Facility utilization 2014
Tremont Supply Co (Dixon)	✓ active	Solano Co/ Dixon	outbound	ag product	50%
Tolenas Bus Park Clorox	✓ active	Fairfield	outbound	bulk liquid chemical	60%
Tolenas Bus Park Ball Metal Beverage	✓ active	Fairfield	outbound	bev container	40%
Tolenas Bus Park Macro Plastics	✓ active	Fairfield	outbound	plastic raw materials	40%
Tolenas Bus Park Goodyear	✓ active	Fairfield	outbound	rubber product materials	50%
Tolenas Bus Park Nexeo Solutions	✓ active	Fairfield	outbound	bulk liquid chemical	40%
Tolenas Bus Park Sunpol Resins	✓ active	Fairfield	outbound	bulk liquid chemical	60%
Tolenas Bus Park Compu-Tech Lumber	✓ active	Fairfield	inbound	dim lumber	20%
Tolenas Bus Park Frank-Lin Distillers	✓ active	Fairfield	inbound	beverage product	60%
Anheuser Busch	✓ active	Fairfield	inbound	beverage production supply	60%
Sheldon United Terminal	✓ active	Fairfield	inbound	propane	70%
Valero Benicia	✓ active	Benicia	inbound	refined petroleum products	70%
Benicia Ind Park Terminal Biagi Bros	✓ active	Benicia	inbound	beverage product	50%
Benicia Ind Park Coca-Cola Enterprises Inc.	✓ active	Benicia	inbound	beverage product	30%
AmPORTS Auto rack	✓ active	Benicia	inbound	finished autos	70%
AmPORTS Benicia Port Terminal	✓ active	Benicia	inbound	petroleum feedstocks	70%
Vallejo Mare Island Terminal	✓ active	Vallejo	inbound	railcars	10%

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7 APPENDIX: COMMUNITY IMPACTS SUMMARY (in progress)

When additional data is available from potential RSBs returning to rail and future RSB site development assumptions are agreed, a 10 year growth in traffic on the rail network in Solano will be broken out by the seven individual jurisdictions:

- Unincorporated Solano County
- City of Vallejo (including Mare Island)
- City of Benicia
- City of Fairfield
- Suisun City
- City of Vacaville
- City of Dixon

to create a community impacts summary, covering three indicators:

1. Change in estimated railcar volumes within each jurisdiction (expressed as a range)

2. Change in overall train movements within each jurisdiction (expressed as a range)

(The second indicator will be completed in analysis of the subsequent task next updating the 2012 rail safety/grade crossings inventory, scheduled for).

3. A measure of the truck equivalent movements that the 10-year incremental growth in rail traffic would translate to if they were to travel by road in Solano (expressed as vehicle-miles, not on individual routings).

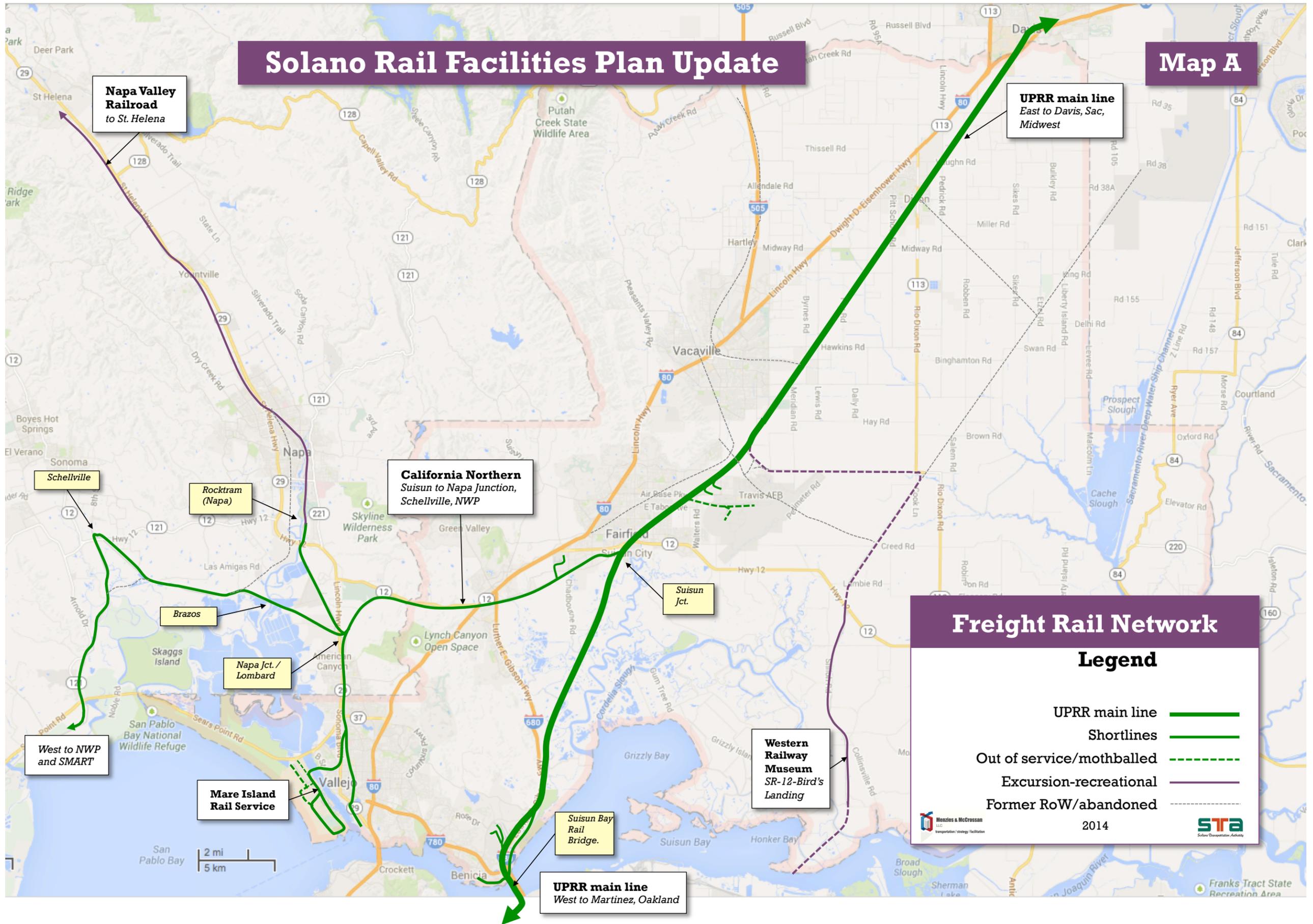
Note that since existing rail traffic is already moved by the most advantageous or appropriate or cost-effective mode, the consultant team will not include any those movements in the truck-equivalent calculations, although the data is available if the Technical Advisory Committee sees this as relevant to the Plan Update.

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.

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.

Solano Rail Facilities Plan Update

Map A



Napa Valley Railroad
to St. Helena

UPRR main line
East to Davis, Sac,
Midwest

California Northern
Suisun to Napa Junction,
Schellville, NWP

Schellville

Rocktram
(Napa)

Suisun Jct.

Brazos

Napa Jct./
Lombard

Western Railway Museum
SR-12-Bird's
Landing

West to NWP
and SMART

Mare Island
Rail Service

Suisun Bay
Rail
Bridge.

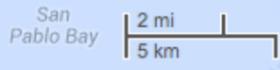
UPRR main line
West to Martinez, Oakland

Freight Rail Network

Legend

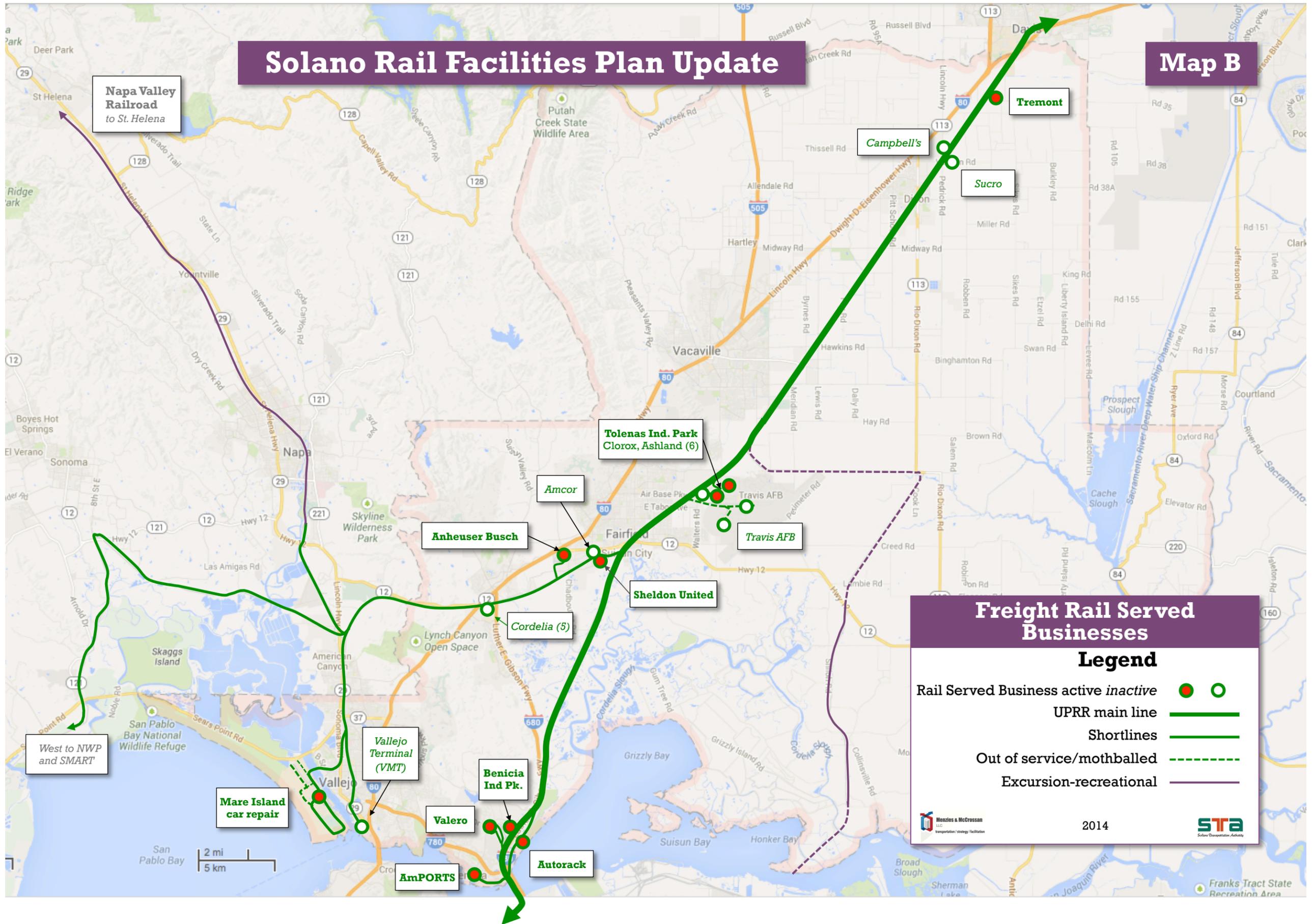
- UPRR main line ———
- Shortlines ———
- Out of service/mothballed - - - - -
- Excursion-recreational ———
- Former RoW/abandoned - - - - -

2014



Solano Rail Facilities Plan Update

Map B



Freight Rail Served Businesses

Legend

- Rail Served Business active ● inactive ○
- UPRR main line —
- Shortlines —
- Out of service/mothballed - - -
- Excursion-recreational —



2014



Napa Valley Railroad to St. Helena

Campbell's

Tremont

Sucro

Tolenas Ind. Park Clorox, Ashland (6)

Amcor

Anheuser Busch

Travis AFB

Sheldon United

Cordelia (5)

West to NWP and SMART

Mare Island car repair

Vallejo Terminal (VMT)

Benicia Ind. Pk.

Valero

Autorack

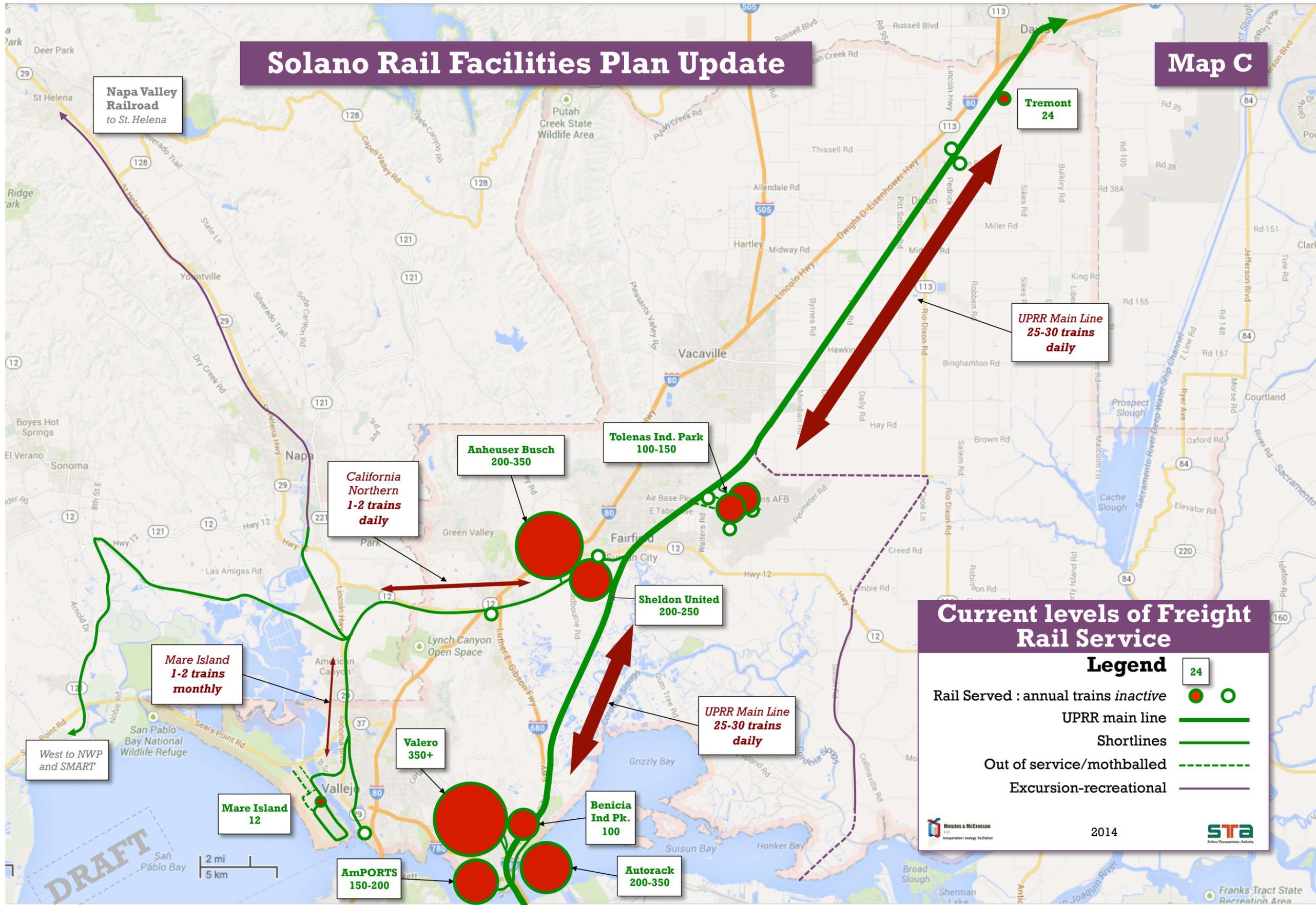
AmPORTS

2 mi / 5 km

Franks Tract State Recreation Area

Solano Rail Facilities Plan Update

Map C



Current levels of Freight Rail Service

Legend

- Rail Served : annual trains *inactive* 24
- UPRR main line —
- Shortlines —
- Out of service/mothballed - - -
- Excursion-recreational —

2014

DRAFT

2 mi
5 km

Franks Tract State Recreation Area

Solano Rail Facilities Plan Update

Map D



Napa Valley Railroad to St. Helena

700 acre development area Dixon / County

Planning Area 6A Fairfield /County

Planning Area 6B Fairfield /County

Cordelia Rd Fairfield

Possible Locations for Large Scale Freight Rail

Legend

- Rail Served Business active ● inactive ○
- UPRR main line —
- Shortlines —
- Out of service/mothballed - - -
- Excursion-recreational —
- New large freight rail RSB site ●



2014



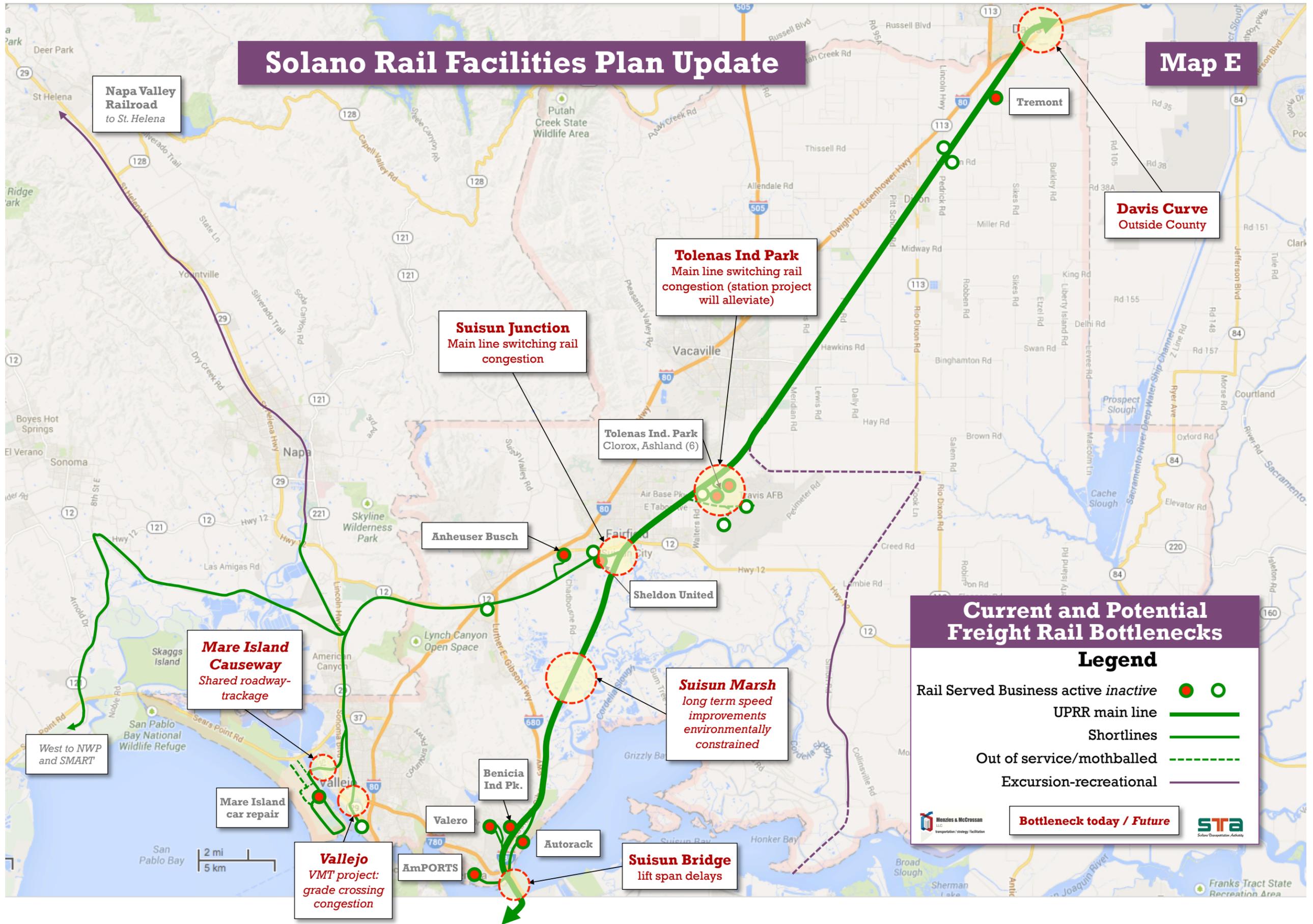
DRAFT

2 mi
5 km

Franks Tract State Recreation Area

Solano Rail Facilities Plan Update

Map E



Napa Valley Railroad
to St. Helena

Suisun Junction
Main line switching rail congestion

Tolenas Ind Park
Main line switching rail congestion (station project will alleviate)

Davis Curve
Outside County

Tolenas Ind. Park
Clorox, Ashland (6)

Anheuser Busch

Sheldon United

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



Mare Island Causeway
Shared roadway-trackage

Suisun Marsh
long term speed improvements environmentally constrained

West to NWP and SMART

Mare Island car repair

Vallejo
VMT project: grade crossing congestion

Benicia Ind Pk.

Valero

Autorack

Suisun Bridge
lift span delays

AmPORTS

2 mi / 5 km

Franks Tract State Recreation Area