State Route 12 Corridor Transit Study

Submitted to:
Solano Transportation Authority
Napa County Transportation Planning Agency

Submitted by Urbitran Associates
JANUARY 2006

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Executive Summary: State Route 12 Transit Corridor Study

BACKGROUND

The intercity express bus services that are oriented to the State Route 12 corridor linking Rio Vista to Napa Valley comprise a critical element of multi-modal transportation services for Solano County and Napa County. This report provides viable alternatives through the development of a service plan that addresses current and future transit needs and the accompanying operating, organizational, and financial details to successfully implement the plan. According to the Solano Comprehensive Transportation Plan 2030, there is an expected significant increase in peak hour congestion by 2030. Currently, Solano County commuters travel an average 25 miles to get to work - the longest commute within the Bay Area. Other studies made during the past two years in Napa and Solano Counties indicate an adverse impact on quality of life, if there is no added investment in intercity transit services. These studies include the Napa/Solano Passenger Rail Study (2003), the I-80/680/780 Transit Corridor Study (2004), and the Caltrans' Regional Express Bus Plan (2005).

Many major employment generators are located within a 1.5 mile radius of the State Route 12 that create hot spots at peak hour congestion. The combined 2030 peak commute hour person trips with origin or destination created within about ½ mile of State Route 12 in east-west directions is projected at 941. According to Commute Profile 2004, the percentage of residents who carpool is significant in Napa and Solano County. Solano has the highest rate of carpooling (22%) in the Bay Area. With increasing population and congestion, the residents along the SR 12 Corridor in the two counties will have few alternatives but to travel by single occupancy, carpool or vanpool vehicles.

EXISTING INTERCITY BUS SERVICES

Rio Vista Transit operates general public, dial-a-ride service within Rio Vista and to a number of regional destinations, including Fairfield, Antioch, Lodi, and Vacaville. Service operates Monday through Friday, from 8:30 AM to 5:00 PM. Vallejo Transit operates five intercity routes - Routes 80, 85, 90, 91, and 92. Routes 80. 85 and 92 operate Monday through Sunday. Routes 90 and 91 only operate on weekdays. Fairfield/Suisun Transit (FST) operates fixed route transit service within the cities of Fairfield and Suisun City. In addition to seven local routes, FST operates three intercity routes – Routes 20, 30, and 40. All local routes and Route 20 operate Monday through Saturday, while the remaining two intercity routes operate only on weekdays.

EXISTING PARK AND RIDE AND TRANSIT CENTER FACILITIES

There are two existing transit hubs that would be served by SR-12 transit service: Fairfield Transportation Center (approximately 640 parking spaces, 10 bus bays, and a transit information center) and the Suisun City Train Station (approximately 250 parking spaces, 4 bus bays, rail/transit information center and Capitol Corridor rail service).

EXISTING RAIL SERVICES

Current passenger rail services link Solano County to the Bay Area and Sacramento region. As of November 2005, service includes twelve daily round trips; service to and

from Suisun City operates approximately every 1-11/2 hours throughout the day. Predominant travel is from Suisun City to Sacramento, and between Suisun City and Emeryville (with a bus connection to San Francisco).

ROUTING AND PHASING OF SERVICE IMPROVEMENTS

In order to address cost concerns and encourage the long-term success of SR-12 service, this service plan launches transit service in the corridor in three distinct phases.

- Phase 1 introduces commuter service between Suisun City Amtrak Station and the Napa VINE Transportation Center with limited midday service.
- Phase 2 introduces the service between Suisun City Amtrak Station, Fairfield Transportation Center and Rio Vista.
- Phase 3 increases both peak period and off-peak period service between Rio Vista, Suisun City, Fairfield and Napa.

The primary preliminary route design would consist of bus service between approximately 5 AM and 8 PM, with more service in the peak commute hours than in the midday period. Service span would increase slightly with each successive implementation phase. To consolidate and build upon the current market strength, recommendations are made to;

- Provide direct connections to major worksites and intermodal transfer locations during the peak period, and to connect to shopping, educational and other uses during the midday.
- Utilize current transit connections such as the Fairfield Transportation Center and the Suisun Amtrak Station, as well as connections with the NAPA VINE Route 10 to augment existing transit use by providing better connectivity.

Phase 1

The estimated peak period service will operate on a 110-minute cycle time, or 50 minutes in each direction with a five-minute layover at each end. The added stops would increase the cycle time to 120 minutes, or 55 minutes in each direction with a five-minute layover at each end, during the off-peak period. Over the long range, this service frequency should allow ample time for buses to reach stops (assuming the proposed improvements to Jameson Canyon are eventually made), with brief layovers at the end of each run built into the schedule. If sufficient improvements to Jamison Canyon are not in place at the time the service is implemented and a timely schedule is difficult to achieve, the study team discussed the possibly of having the option of using American Canyon Road as an alternative bypass route during times of incidents or extreme congestion.

Phase 2

With the addition of service to Rio Vista, peak period service is estimated to operate on a 160-minute cycle time, or 75 minutes in each direction with a five-minute layover at each end. During the off-peak period, the added stops would increase the cycle time to 170 minutes, or 80 minutes in each direction with a five-minute layover at each end.

Phase 3

Phase 3 calls for expanded service (primarily a few additional off-peak stops) between Rio Vista, Suisun City and Napa. Cycle times will remain the same as used in Phase 2.

Figure ES 1 Proposed Peak-Hour Alignment for SR-12 Transit Service

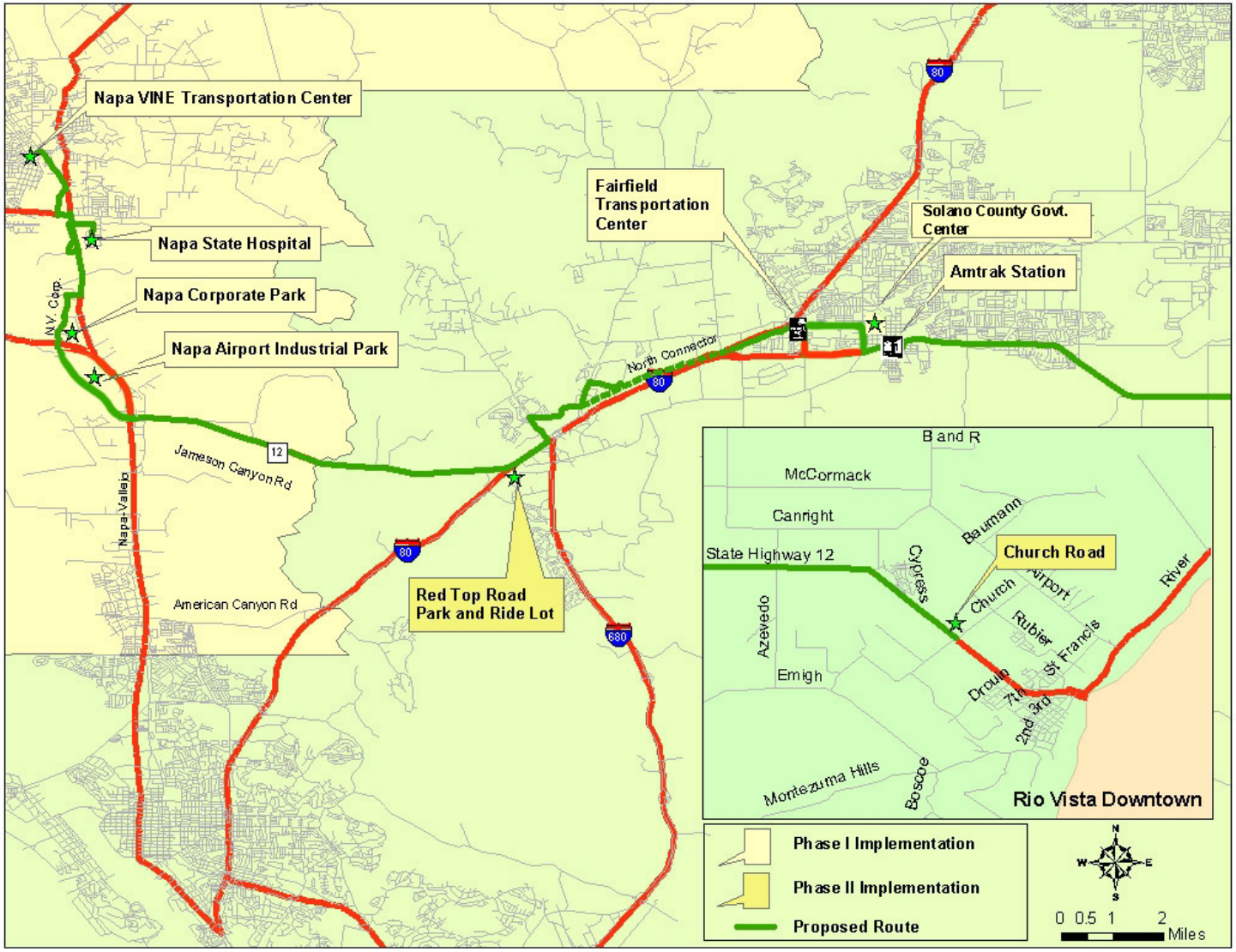
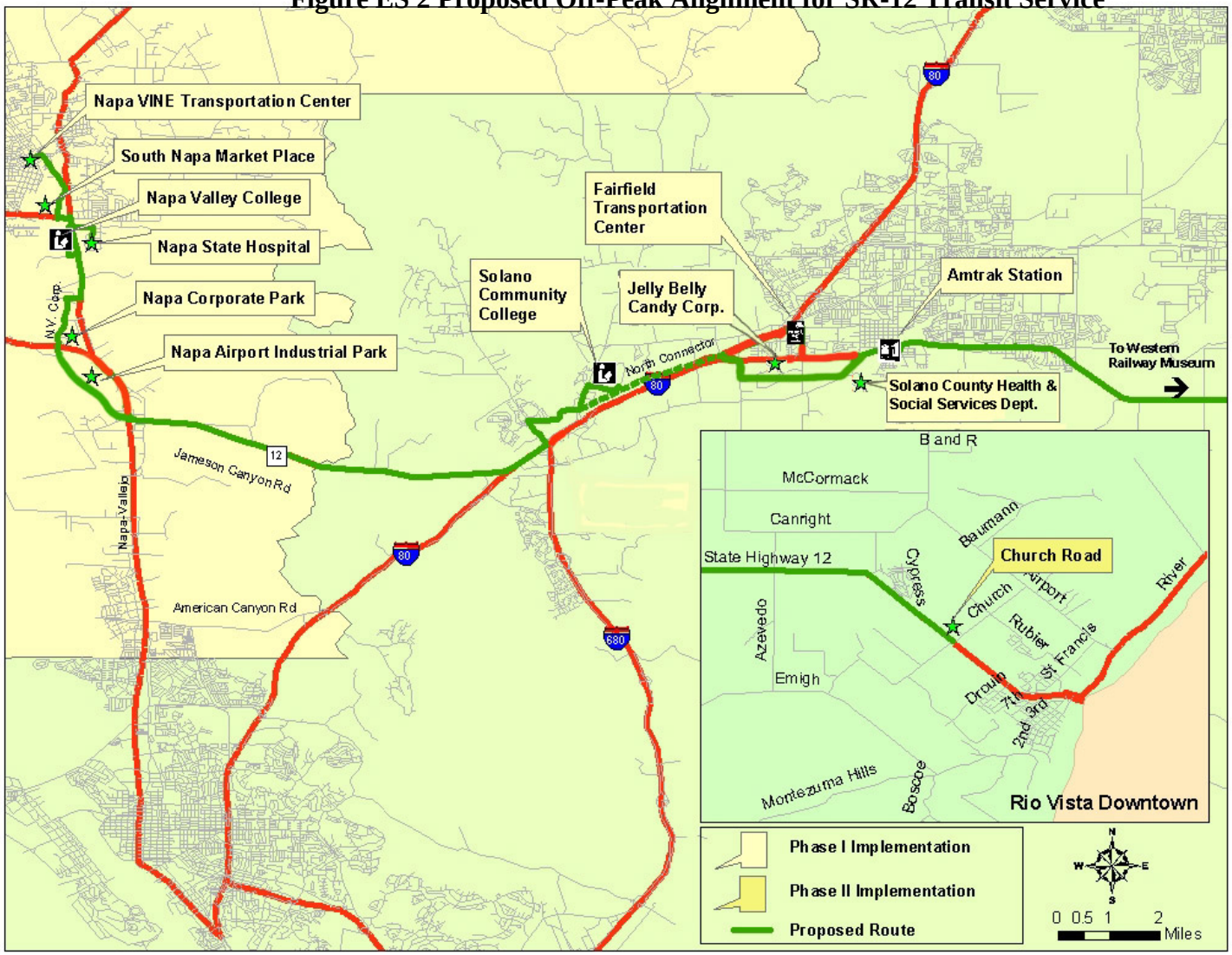


Figure ES 2 Proposed Off-Peak Alignment for SR-12 Transit Service



Fare Structure

Choosing an appropriate fare structure and policies for a particular service are vital to the successful implementation of new transit service. There are a variety of factors that influence this decision, including:

- Fare structure of neighboring transit systems,
- Intended service markets,
- Farebox recovery ratio requirements, and
- Availability of funding revenue.

Fares should be set so that they are consistent with existing services, appropriate for the intended market, and meet whatever funding goal the service might have.

Table ES 1

Recommended Fare Structure for SR-12 Service

Fare Type	User	Phases 1	Phases 2 and 3	
			Base	*Maximum*
Single Ride Fare	General public	$2.50	$2.50	3.75
	Senior or person with a disability	$1.25	$1.25	1.75
Monthly Pass	General public	$70.00	$70.00	$105.00
	Senior or person with a disability	$35.00	$35.00	$50.00
Transfer to/from another system	All	Base Fare Credit	Base Fare Credit	Base Fare Credit

BUS STOPS AND SIGNAGE

Investment to consolidate bus stop signage indicating the beginning and terminal points of service is required. In addition to modifying existing bus stop signage to include SR-12 service, at least 3 new bus stop signs will need to be installed.

OPERATING COSTS AND REVENUES

Service Contract

The service contract constitutes the largest portion of the service's operating costs.

- Annual service hours for the Phase 1 are estimated at 3,133, increasing to 5,842 in Phase 2 and to 7,535 in Phase 3. The rate of $84 was used for the budget is based on the most recent reported cost per hour (FY 2003-2004) for Fairfield Suisun Transit (adjusted by 5% to obtain a 2005 dollar estimate). This rate accounts for both the contractor rate and in-house operating and maintenance expenses.

Marketing
Marketing SR-12 service prior to service initiation and then once it is in operation will be vital to the success of the service. For the purpose of budgeting, marketing efforts are concentrated at the beginning of the service to ensure that potential riders are well educated about the service. In the first year of service (Phase 1), $15,000 is allocated for marketing, $10,000 for Phase 2, and $5,000 Phase 3.

OPERATING REVENUES
Farebox recovery will be a part of the overall consideration of cost versus revenue. The estimated revenues and farebox recovery ratio based on base year 2005 demand numbers are shown in Table ES 2.

Table ES 2

Estimated 2005 Base Year Fare Revenues and Farebox Recovery Ratios 1.)

	Phase 1	Phase 2	Phase 3
Annual Fare Revenue	$52,006	$70,612	$74,676
Farebox Recovery Ratio	19.7%	14.3%	11.8%

1.) See page 65 for more detailed analysis

CAPITAL COSTS
Vehicle Procurement
Capital costs for the SR-12 service are dominated by the cost to purchase or lease three heavy-duty buses and an average purchase price of $500,000 is assumed in the budget.

Bus Stops & Shelters
The capital cost of making improvements to shared stops is assumed to be split equally between the service and the other agency(ies) serving the stop. The cost to install bus stops is assumed to be $5,000 (including concrete, etc.), and for shelters with benches and concrete pads, the cost is $20,000.

Fueling and Maintenance Facilities
At this time, it is assumed that no additional fueling and maintenance facilities will be needed to operate SR-12 service.

Approximately three new bus stops locations are proposed over the duration of the three phases.

Table ES 3

Locations of New Bus Stops

Location	Implementation Phase	Number of stops
Church Road, Rio Vista	2	2 (eastbound & westbound)
Red Top Road Park and Ride Lot	3	1

Location	Implementation Phase	Number of stops
Total		3

CAPITAL REVENUES

The proposed transportation sales tax measures for both Solano County and Napa County would provide funding for roadway improvements along SR-12, particularly in Jameson Canyon, as well as much of the startup costs for SR-12 transit service. Each of the proposed sales tax measures should also consider this proposed intercity/express bus service as a key component of improving mobility along the SR 12 Corridor.

In addition to the sales tax measure, funding may be available from the TDA sources of Napa and Solano counties. Grant money from the Bay Area Air Quality Management District's Transportation for Clean Air Fund (TFCA) or federal Congestion Mitigation & Air Quality Improvement Program (CMAQ) funding sources may also be available for either capital and/or operating purposes, usually for up to a three year start-up service period.

MARKETING PLAN

This program will require a high degree of coordination between Napa VINE, Fairfield Suisun Transit, Rio Vista Transit, Solano Transportation Authority (STA), Napa County Transportation Planning Agency (NCTPA), Solano Napa Commuter Information (SNCI) and the Metropolitan Transportation Commission. Each of these agency's marketing programs would be used to promote this service including the following:

- Provide essential information such as maps, route schedules, and timetables;
- Provide contact information;
- Solicit customer feedback;
- Provide time-sensitive information regarding the operation of the service;
- Display current marketing efforts and introduce new marketing campaigns; and
- Provide links to other local transit operators.

IMPLEMENTATION PLAN

Assuming that adequate funding sources are made available, the proposed SR 12 Transit Corridor service is proposed to be fully implemented in phases, with the initial phase(s) commencing when there is sufficient committed funding. Base on when the actual service commences, the proposed annual operating costs and implementation phases are projected as follows based on a range of ridership and farebox demand numbers from the 2005 base year to 2030. All numbers are based on 2005 operating costs and have not been escalated to future dollars.

Table ES 4-1-1

2005 Base Year	Phase 1	Phase 2	Phase 3
Est. Annual Ridership	29,718	35,306	37,338
Annual Operating Costs [1]	$263,172	$490,728	$632,940
Annual Farebox Revenue [2]	$ 52,006	$ 70,612	$74,676
Est. Farebox Recovery Ratio	19.7%	14.3%	11.8%
Est. Subsidy Cost Per Passenger	$7.10	$11.8	$ 14.9

1. OPERATING COSTS ARE BASED ON 2005 OPERATING COSTS FOR FAIRFIELD-SUISUN TRANSIT OF $84 PER HOUR
2. ESTIMATED FAREBOX REVENUE IS BASED ON AN AVERAGE FARE OF $1.75 PER RIDER IN PHASE 1 AND $2.00 PER RIDER IN PHASES 2 AND 3.

Table ES 4-1-2

2030 Projections	Phase 1	Phase 2	Phase 3
Est. Annual Ridership	48,768	57,912	60,452
Annual Operating Costs [1]	$263,172	$490,728	632,940
Annual Farebox Revenue [2]	$ 85,344	$ 115,824	$120,904
Est. Farebox Recovery Ratio	32.4%	23.6%	19.1%
Est. Subsidy Cost Per Passenger	$3.74	$6.47	$ 8.4

1. OPERATING COSTS ARE BASED ON 2005 OPERATING COSTS FOR FAIRFIELD-SUISUN TRANSIT OF $84 PER HOUR
2. ESTIMATED FAREBOX REVENUE IS BASED ON AN AVERAGE FARE OF $1.75 PER RIDER IN PHASE 1 AND $2.00 PER RIDER IN PHASES 2 AND 3.

NEXT STEPS

Once the SR 12 Transit Corridor study is approved by both the STA and NCTPA Boards, follow-up actions to implement the proposed three-phased service plan are recommended. Specific tasks that should be addressed include:

1
2
1
2

- Direct subscription bus service between the Fairfield-Suisun City area and the Queen of the Valley Hospital and privately operated vanpools to be formed with the assistance of Solano Napa Commuter Information program should be further explored and/or implemented in the short term (i.e. during 2006 and 2007) before any commitments are made to implement express/intercity bus service along the corridor.
- Development of a Memorandum of Understanding (MOU) between STA, NCTPA (the Vine) and Fairfield-Suisun Transit to identify roles and responsibilities for purchasing buses, operating the service, providing the necessary funding and marketing the service prior to implementation of Phase 1 service between Fairfield and Napa.
- Development of a multi-year intercity MOU funding agreement between the STA, City of Rio Vista, City of Suisun City, City of Fairfield (Fairfield – Suisun Transit) and County of Solano prior to implementation of the Phase 2 service connecting Rio Vista and Fairfield - Suisun City.
- Funding sources for capital improvements along the corridor, to improve bus stops, shelters and provide new or expanded park and ride facilities, should be pursued for each phase of service.
- On-board surveys of riders on existing connecting services and adjoining routes and/or a telephone survey of likely riders residing or employed along the corridor should be conducted during 2006 or 2007 by STA and NCTPA to confirm precise stops and destinations, proposed fares and schedule before any service is initiated.
- In 2006, the SR 12 Steering Committee should meet again to consider a more detailed/refined implementation plan and schedule for implementing the new service.
- The STA, NCTPA, member agencies and/or Caltrans should enter into necessary MOU's and/or Co-operative agreements to ensure that the improvements needed to implement the necessary road and safety projects along SR 12 are implemented on schedule.
- Each of the proposed transportation sales tax measures for Napa and Solano Counties should consider this proposed intercity/express bus service as a key component of improving mobility along the SR 12 Corridor.

CHAPTER ONE EXISTING CONDITIONS

Designing a transit route to meet communities' needs in an efficient and effective manner requires a thorough understanding of the operating environment, existing transit service and potential demand for the service. This transit corridor study presents relevant findings from recent plans and studies, information on area transit operations and specifically intercity routes, and the demographic characteristics of, and travel behavior in, Solano and Napa Counties. These findings help provide the basis for subsequent steps in the planning process for the implementation of the proposed service.

1.1 Previous Studies and Plans

This section summarizes key findings from other transportation studies and plans. It will inform policy makers about concurrent projects and how they might impact transit service on State Route 12 (SR-12), and present the work of previous studies that may help assess demand for the service or influence its characteristics.

Napa/Solano Passenger/Freight Rail Study (2003)

a. Purpose

The *Napa/Solano Passenger/Freight Rail Study* had four basic objectives:

- To determine the economic feasibility of passenger rail service
- To determine the economic feasibility of enhanced freight rail activity
- To compare the operating costs of rail and bus service, and
- To examine the long-term potential of connecting passenger rail service.

The final study included the necessary elements for a new start public rail transportation plan: route and equipment selection, station characteristics, capital and operating costs, freight and passenger operations on shared tracks, and environmental impacts.

b. Relevant Findings

A significant amount of the work completed for the *Napa/Solano Passenger/Freight Rail Study* could benefit the current study, in particular the evaluation of stop locations, demand estimation, and cost estimates. The following summarizes the most relevant components of the rail study.

Although bus stops typically have less impact on land use than rail stations, the site selection of each often examine the same characteristics. The following is a subset of the criteria used in evaluating possible station locations, with an eye to operability and the potential to encourage transit use: size; access; availability; safe and attractive pedestrian connections to activity and/or population centers; visibility and proximity to activity and/or population centers; shared parking facility opportunities; and community support.

Major employment clusters were identified during the planning process, of relevance to the current study are: southern Napa business parks (Napa Airport Business Center and Napa Gateway Business Park), Napa Corporate Park, Napa State Hospital and Napa Valley College.

Data on existing travel patterns (from Census 2000) was presented in conjunction with the demand estimates. Some of the findings were:

- Share of commuters leaving for work between 6:00 AM and 9:00 AM was nearly 62 percent within Napa County and 57 percent within Solano County.
- Solano residents tend to leave for work earlier than Napa residents, and
- Marathon commuters are more prevalent in Solano County than in Napa County, with 31 percent of Solano County commuters having a commute more than 40 minutes as compared to 18 percent in Napa County.

The following operating characteristics describe the bus service needed to accommodate demand generated by the proposed rail service along SR-12.

- Estimated peak period rail ridership along the SR-12 corridor in 2010 was 751 between Fairfield and Napa and 126 between Napa and Fairfield.
- Projected travel time between Suisun/Fairfield and Napa was 30 minutes.
- Assuming the use of 40-foot buses, 42 seated passengers and requiring all passengers have a seat, 18 bus trips would be needed to meet the demand for service between Fairfield and Napa, which translates to headways of 10 minutes. This level of service would cost roughly $487,880 to operate annually for weekday (250 weekdays) and weekend service (104 weekend days).

Note that in practice demand for bus service is expected to be lower than for rail service.

I-80/I-680/I-780 Transit Corridor Study (2004)

a. Purpose

The purpose of this study was to implement the Intercity Bus Element from the Solano Comprehensive Transportation Plan through the development of detailed transit improvements along the corridors defined by I-80, I-680, and I-780.

b. Relevant Findings

Although transit in the SR-12 corridor was not dealt with in detail in this study, some of the roadway and park and ride improvements would benefit the service – especially in relation to the stretch of SR-12 that overlaps with I-80 around Fairfield. In particular, recommendations that could benefit SR-12 transit service include:

- **Fairfield Transportation Center access improvements** including modification of the traffic control for the eastbound I-80 off ramp; adding a second westbound approach lane on Oliver Road at West Texas Street; and signalizing the eastbound

off ramp to allow for a bus driveway into the transit island will improve the flow of transit vehicles to and around the center.

- **Development of a new park and ride facility at Red Top Road at I-80** will add parking capacity at a location more accessible to SR-12 than the existing, informal Red Top Road park and ride.
- **Expansion of the Fairfield Transportation Center** to replace the existing surface lot with a 600-space parking garage at an estimated cost of $12 million.
- **Relocation of the Fairfield Suisun Transit garage** to a larger, dedicated facility.
- **Walters Road Park and Ride** would add a parking area for Suisun residents using the SR-12 transit service.
- **Additional highway coordination** such as installing ITS changeable message signs with information on the availability of parking spaces and bus signal timing preferences at high volume intersections could improve the speed of SR-12 service and the ease of using it.

At the time of the study's completion, nine intercity bus routes were operated within Solano County. These routes included Benicia Transit's Route 1, Vallejo Transit's Routes 80, 85, 90, 91 and Fairfield Suisun Transit's Routes 20, 30, 40. Three routes operate on Sundays and four operate on Saturdays.

Rio Vista Transit Study (2005)

a. Purpose

The city of Rio Vista initiated the *Rio Vista Transit Study* to:

- Maintain the system's favorable community awareness,
- Ensure that the transit system is in full compliance with all applicable laws and regulations,
- Establish attainable goals and procedures to meet them, and
- Analyze the changing needs and environment of Rio Vista and recommend ways in which Rio Vista Transit can meet them.

b. Relevant Findings

Rio Vista is the fastest growing community in Solano County and Solano County is one of the fastest growing counties in the Bay Area. Rio Vista Transit provides demand-responsive service throughout the city of Rio Vista in addition to making trips to the communities of Fairfield, Vacaville, Antioch, Walnut Grove, Isleton, Lodi and Stockton. Many of these communities have transit service of their own, but they do not serve Rio Vista. Rio Vista's current and projected population growth are expected to increase the demand for transit service.

An analysis of the daily trip logs from FY 2002-03 showed the following:

- The most common destinations were within Rio Vista (44%), to Lodi (30%), and to Fairfield (16%), and
- The most common trip purpose was for shopping (59%), followed by "other" (21%) and medical (20%). Both Fairfield and Antioch have a high proportion of medical trips (around 45%).

Driver meetings were held to better understand customer concerns and day-to-day operations. Of note for the SR-12 project are the following comments:

- Regular requests from passengers for additional service to Fairfield,
- The transit system periodically receives trip requests from the Delta Loop/Tower Park community in Sacramento County,
- Passengers also request improved connections to Fairfield/Suisun Transit and BART, and
- Requests for additional service to destinations currently served.

Because of Rio Vista's small size and relatively remote location, it had fewer transportation alternatives. In February 2005, the new Rio Vista Plan was implemented to significantly improve the mobility and accessibility for Rio Vista residents.

Napa Community Based Transportation Plan (2004)

a. Background

The Napa Community Based Transportation Plan (CBTP) was funded by a grant from the Metropolitan Transportation Commission (MTC) to advance the findings of the *Lifeline Transportation Network Report*, which recommended the preparation of community-based transportation plans to address transit needs identified in economically disadvantaged communities throughout the San Francisco Bay Area. The project involved an extensive community process, technical analysis and coordination with NCTPA to develop solutions to identified transportation gaps.

b. Relevant Findings and Recommendations

Following extensive public outreach and analysis to generate a list of transportation issues, transportation solutions were identified and rated in four categories (community importance, cost implications, implementability, and impact on usability) to produce a list of prioritized solutions. The prioritized solutions were: a farm worker shuttle; to improve route connectivity through revised schedules; flexibly-routed service for qualifying residents; to organize vanpools to employment destinations; to install bus shelters; to re-stripe crosswalks as needed to improve safety; and to improve route performance.

The recommendations to improve route connectivity and organize vanpools are particularly relevant to the SR-12 Transit Study. First, when designing the service schedule, every effort should be made to coordinate the SR-12 service with local routes to minimize the waiting and total travel times for passengers. Second, the interest in vanpools was partially driven by the need for transit service for all work shifts. As such, the design of the SR-12 service schedule should account for multiple work shifts.

Solano Comprehensive Transportation 2030 Plan (2005)

a. Purpose

The Solano Comprehensive Transportation Plan (CTP) was developed to identify a future transportation vision for Solano County. Community input helped spot transportation needs, which were then associated with specific modes and prioritized. Next, these priorities were evaluated to determine if existing funding sources could address needs, if not, potential revenue options were identified. The plan was split into three elements – 1) transit, 2) arterials, highways and freeways, and 3) alternative modes. All elements of the CTP have the potential to impact transit service along SR-12.

b. Relevant Findings

Solano County faces significant challenges in the coming 25 years to address the transportation needs of its projected growth. Solano County is expected to be the fastest growing county within the Bay Area, with 48% growth in the population and 59% growth in total jobs. The fastest growth is expected in Rio Vista and unincorporated parts of the county. Adding to this growth is the fact that the share of the population over 65 will increase from 9% in 2000 to 19% in 2030, which will impact the need for transportation alternatives. Commensurate with this growth is the expected increase in peak hour congestion. Large portions of SR-12 are expected to have major congestion by 2025. Currently, Solano County commuters travel an average 25 miles to get to work – the longest commute within the Bay Area.

Transit service along SR-12 has the potential to help Solano County move closer towards the general goals developed in the CTP. In particular, SR-12 transit service would:

- Promote *Goal 1: Intermodal Systems* by providing another choice for people traveling between Napa and Solano Counties, and as a transit route that can be accessed by multiple modes, such as local transit routes, personal vehicles, walking or bicycling.
- Support *Goal 2: Quality of Life* by providing an alternative to driving on congested roadways. This also offers a productive use of travel time and the potential to reduce congestion along SR-12.
- Benefit *Goal 5: Environment/Air Quality* when passengers switch from driving alone or carpooling to transit. Moving people to higher capacity modes of travel has the potential to improve air quality by reducing the number of vehicles on the road and reducing congestion.

SR-12 transit service would also help the county attain its goals from the transit element in that it would provide intercity public transit service; provide a new service to maximize usage; provide an efficient intercity transit service to maximize ridership and cost effectiveness; and integrate with local transit and other modes to provide a seamless multimodal transportation system.

Within the transit element of the CTP, each jurisdiction identified their own transit needs. Many of these needs would be addressed through the implementation of transit service along SR-12, and include expanded express bus service (Fairfield), fixed intercity routes to BART and rail (Rio Vista), and more joint bus operations (Solano County).

Also of note was discussion about transit hubs, park and ride facilities, and planned construction. There are two existing transit hubs that are likely to be served by SR-12 transit service – Fairfield Transportation Center (640 parking spaces, 10 bus bays, and a transit information center) and the Suisun City Train Station (250 parking spaces, 4 bus bays and a rail/transit information center). Funds have been secured for funding high occupancy vehicle lanes within the I-80/I-680/12 interchange, the easterly and central segments of the North Connector and safety improvements to SR-12 between Suisun City and Rio Vista and a westbound Truck Climbing Lane on SR 12 West. Also environmental documents are currently underway for the widening of SR-12 between I-80 and SR 29 (Jameson Canyon).

In the alternative modes element of the CTP, needs were again identified by jurisdiction. Some of these needs, particularly the park and ride facilities, would facilitate use of SR-12 transit service. These projects include: I-80/Red Top Road park and ride lot (Fairfield), SR-12/Church park and ride lot (Rio Vista), and emergency ride home program (Solano County). Of concern is that many of the existing park and ride lots are almost at capacity, or have exceeded their capacity. This is the case at the Green Valley lot in Fairfield and at the Suisun City Train Station.

Plans to expand the park-and-ride lots within the vicinity of the SR 12 corridor in Solano County would provide approximately 650 new parking spaces. Also within the alternatives modes section, bikeway projects also have the potential to increase the success of the transit service by providing another means of access to it. The county plans to create a 138-mile bike network could dramatically increase the number of passengers who get to a transit hub by bicycle.

The bus service plan in the Solano Comprehensive Transportation Plan (CTP) 2030 recommended a series of long range intercity bus transit routes for implementation, and includes some of the same short range recommendations as in this transit study (i.e. the Phase 1 Napa to Fairfield-Suisun City service), but also provides a longer term vision for eventually connecting transit services to San Joaquin and Contra Costa counties along SR 12 and SR 160.

- **Route 12A** would establish a new link between Napa, Fairfield, and Suisun via SR-12. This service would eventually provide 60-minute headways all day by 2030.
- **Route 12B** would establish a new link between Rio Vista and Fairfield and Suisun City via Highway 12. This service would eventually provide 60-minute headways all day by 2030.
- **Route 12C** would establish a new link between Rio Vista and Lodi via Highway 12. This service would eventually provide 60-minute headways all day by 2030.
- **Route 12D** would establish a new link between Rio Vista and Antioch via Highway 160. This service would eventually provide 60-minute headways all day by 2030.

The operating characteristics of these services are outlined in Table 1-1.

Table 1-1 Intercity Bus Network for Years 2005 to 2030

Route	To/from	Headways		Bus Requirement		Cycle Time
		Peak	Off peak	Peak	Off peak	
12A	Napa to Suisun Amtrak Station	60	60	1.5	2	90
12B	Suisun Station to Rio Vista	60	60	1.5	2	90
12C	Rio Vista to Lodi	60	0	1	0	60
12D	Rio Vista to Antioch	60	0	1	0	60

Another component of the plan's transit element was a discussion of the intercity transit support system, including park and ride facilities and intermodal transit stations. The following park and ride locations were recommended for Rio Vista:

- Highway 12 and Church Street
- Downtown near Main Street.

Highway 12 Major Investment Study (2001)

a. Purpose

Completed in 2001, this report explored a number of alternatives to maintain safety and desired level of service (LOS) ratings on Highway 12 as future demand increases. The corridor studied includes the portion of SR-12 between I-80 and the Rio Vista Bridge and the results identified the type and size of roadway improvements and a phased implementation plan. This study is currently being updated with a list of prioritized projects.

b. Relevant Findings and Conclusions

Of the intersections and highways examined in the recent 2005 update of the SR 12 MIS study the volume/capacity ratio of the intersection of SR-12 and Pennsylvania Avenue

had very marginal performance (i.e. LOS F), and currently requires mitigation during the PM peak hour. Other intersections along the corridor will also require operational improvements to maintain acceptable levels of service over the next 10 years and more as traffic volumes increase.

The SR 12 MIS report developed five build alternatives and one no-build alternative to address the expected traffic volume increases. Of those six alternatives, three (Transportation Demand Management (TDM), Safety Improvements, and Traffic Operations) are recommended for near-term implementation and four (TDM, Safety Improvements, Traffic Operations, and Main-Line Widening) are recommended for long-term implementation. The Traffic Operations and Main-Line Widening alternatives, in particular, are expected to positively impact the performance of transit service along SR-12 by improving traffic flow. Safety improvements will also be beneficial by reducing the number of traffic incidents and their associated delay.

Alternative Package 2 – Transportation Demand Management (TDM) is somewhat different in that it recommends the provision of transit service and supportive programs along SR-12 – essentially endorsing the need for the service explored in this transit corridor. This alternative was recommended as part of the near-term and long-term solutions for the corridor. The following outlines the type of projects included in this alternative:

- **Carpooling Program – Park and Ride Lot Construction** consists of constructing two park-and-ride lots to facilitate carpooling – one in Rio Vista and another in Suisun City. In addition to the physical infrastructure, an advertising campaign is recommended to promote the park-and-ride lots, benefits of carpooling, and the ride-matching services provided by STA.
- **Local Shuttle Program** would connect the retirement communities on the east end of the corridor (Trilogy) with the commercial and medical facilities in Suisun City, Fairfield, and Rio Vista. The service would run on one-hour headways initially and coordinate with existing transit service in Sacramento and San Joaquin counties.
- **Transit Service** would consist of a new SolanoLinks route traveling from Fairfield to Suisun City to Rio Vista along Highway 12. Important transfer points would be at the Capitol Corridor Station (Suisun City) and the Fairfield Transportation Center. This route would also run on one-hour headways initially.

NCTPA Strategic Transportation Plan (1998)

a. Purpose

The *Strategic Transportation Plan* is the Napa region's component of the *Regional Transportation Plan* and will inform decision making on highways, streets and roads, transit, paratransit, and bicycling over a 20-year period.

b. Relevant Elements

Of the four corridors identified in Napa County for the STP, the most relevant to this project is the East/West Corridor, Corridor 2, which encompasses the SR-12 corridor. Two objectives were identified for this corridor: 1) Enhance road and intersection capacities to accommodate future travel demand for commuter, visitor, and freight trips; 2) Reduce accidents through implementation of safety and operational improvements. A number of locations within the corridor have substandard performance now and are expected to have substandard performance in the future. Of particular note are the following projects planned for the corridor: SR-12/29/121 intersection improvements; SR-12/29/Airport Blvd intersection improvements; and to widen SR-12 to four lanes in Jameson Canyon.

In the Transit and Paratransit Services section, the following objectives for transit are also worth noting:

1. Enhance the access to transit for all Napa County residents through expanded service, improved marketing and transit information, and improved coordination between services.
2. Simplify the delivery of transit services by reducing the number of entities directly involved in providing transit operations.
3. Improve interregional connections with neighboring counties.

Transit service along SR-12 would help Napa achieve many of the goals and policies established within it – from better integrating transit with neighboring counties to providing transportation alternatives to improve mobility and reduce congestion and the need for roadway expansions.

1.2 Summary of Previous Studies

The review of recent planning and engineering studies has identified the following, which should be considered during the design of transit service along SR-12.

- Both Napa and Solano Counties have policy goals to promote regional transit service in general, and an intercity transit link along SR-12 specifically. Rationale for the service includes providing alternatives to driving alone, expanding roadway capacity through the use of shared rides, and improving mobility for those without alternatives.
- Recommendations to provide transit service along the SR-12 were included in six of the seven documents reviewed – illustrating widespread interest in the service.
- Demand for service along SR-12 is expected to be the highest from Fairfield/Suisun to Napa. There is also demand for trips from Napa to Fairfield/Suisun and from Rio Vista to destinations to the east and west. As such, the top service priorities are to provide a transit link between Napa and Fairfield/Suisun and between Fairfield/Suisun and Rio Vista. Additional service could increase bus frequency, provide connections to Lodi, or provide service to Antioch.

- Infrastructure projects over the next 20 to 25 years will undoubtedly change the alignment of SR-12 and its travel time. For the purposes of this document, the service design and characteristics will focus on those projects expected to be completed within the next three to five years (i.e. SR 12 SHOPP funded safety improvements along SR 12 E, a truck climbing lane on SR 12 West, and the North Connector in Fairfield).

1.3 Area Transit Operations and Plans

Before making decisions about any new transit service, it is important to first understand how transit services within the region expect to be changing in the coming years. These changes could impact how much service is needed, where it is warranted, and what stops should be served, among other issues.

Fairfield/Suisun Transit (FST)

Fairfield/Suisun Transit operates fixed route transit service within the cities of Fairfield and Suisun City. FST operates local dial-a-ride transit (DART) that provides complementary paratransit service for it's local fixed route service. FST also administers Solano Paratransit, which provides paratransit service throughout northern Solano County. In addition to seven local routes, FST operates three intercity routes – Routes 20, 30, and 40. All local routes and Route 20 operate Monday through Saturday, while the remaining intercity routes only operate on weekdays. Major stop and transfer locations within FST's service area include the Fairfield Transportation Center (served by Routes 3, 7, 30, 40, and Vallejo Transit routes 90, 91, and 92), Suisun/Fairfield Train Station (served by Route 5 and Vallejo Transit Route 90), and Solano Mall (served by Routes 1, 2, 3, 5, 6, 7, 20, 30 and Vallejo Transit routes 85, and 90). The intercity routes also serve the Vacaville Regional Transportation Center and the Pleasant Hill BART station.

It is worth noting that within the next few years FST plans to build a new transit hub in the vicinity of North Texas Street to replace the Solano Mall as its major local transfer location. Like many communities in Solano County, parking for commuters is at a premium. Recent parking projects, including the surface lot and parking garage at the Fairfield Transportation Center, are already at or near capacity. As such, there are plans to replace the surface lot with a 600-space parking structure. Aside from the relocation of the transit hub and restructuring Route 7, no major service changes are anticipated in the near future.

FST uses a zone-based fare structure with general public, cash fares ranging from $1.25 for the shortest, local trips to $5.00 for the longest regional trips. Reduced fares are provided for the elderly, handicapped and students. The vast majority of FST's vehicles are diesel Gilligs, but diesel MCIs are used for the intercity service.

The following are potentially useful results from FST's previous onboard survey, conducted in October 2002:

- **Peak boarding activity** For the entire system, boarding activity peaked from 7:00 to 8:00 AM and 2:00 to 4:00 PM. For intercity routes, Route 20's peak boardings were at 7:30 AM and 3:30 PM, Route 30's peak boardings were at 6:30 AM and 5:00 PM, and Route 40's peak boardings were at 6:13 AM and 4:25 PM.
- **Transfer behavior** Of those surveyed on all routes, 29% needed to transfer to complete their trip. This number was significantly higher for those on Route 20, 57% of whom reported a need to transfer. Routes 30 and 40 had lower than average transfer rates, 21% and 16% respectively.
- **Stop access** The largest group of intercity passengers (~45%) walks to get to and from their boarding and alighting stops. Of those who walked, roughly 50% walked no more than two blocks to get to or from the bus stop. Approximately 40% of passengers drove to, or were dropped off, at their bus stop. Passengers of Route 40 were much more likely (67% vs. 39%) than Route 20 or Route 30 passengers to access their stop with a vehicle.
- **Passenger characteristics** Passengers of Routes 20 and 30 are more likely to be transportation disadvantaged than Route 40 passengers – with lower auto availability and lower incomes. For example, 78% of the respondents from Routes 20 and 30 did not have access to a car to make their trip, while only 23% of Route 40 passengers did not have access to a vehicle. Similarly, 60% of Route 20/30 passengers have incomes under $30,000 while only 11% have incomes over $75,000. In contrast 10% of Route 40 passengers have incomes under $30,000 and 48% have incomes over $75,000.

A new on-board survey will be conducted in 2006. The results of the new service may vary from those shown above, particularly for Route 30 service that was extended to Sacramento in 2003

Napa County Transportation Planning Agency (NCTPA)

NCTPA is the county's transportation planning agency and administers federal and state transportation funding for highways, streets and roads, and public transportation. NCTPA operates seven local fixed routes and the Downtown Trolley in Napa, two intercity routes (Route 10 and 11), community shuttles in Calistoga, St. Helena and Yountville, and complementary paratransit service (VINE Go). NCTPA also provides oversight for American Canyon Transit, which operates deviated fixed route service within that city.

All local routes operate Monday through Saturday. Route 10 operates everyday and route 11 operates four days a week. Major stop and transfer locations within VINE's service area include the Pearl Street Transit Center (served by all routes), South Napa Marketplace (served by Routes 2, 5, 7 and 10), and Napa Valley College (served by Routes 5 and 10). Route 10 also serves Sereno Transit Center, Vallejo Ferry Terminal and the York/Marin Transit Center. Route 11 serves St. Helena, Calistoga and Santa Rose in Sonoma County.

Some of the changes that NCTPA is expecting for its public transportation services include: new express bus service to Vallejo in FY 2006-07; implementation of a flexibly-routed shuttle to operate before and after VINE's regular service hours; introducing service between Napa and Fairfield (the subject of this study); a fare increase; construction of a new downtown transit facility within three years; and construction of park and ride facilities along Hwy 29 between FY 2006-07 and FY 2009-10.

When describing service between Napa and Fairfield, the following operating characteristics were cited: 30-minute peak headways, 60-minute off peak headways, and potential stops at Napa Downtown Transit Center, Napa Valley Corporate Park, Napa Valley College, Airport Industrial Area, the future park and ride at Red Top Road and the Fairfield Transportation Center.

VINE uses a zone-based fare structure with general public, cash fares ranging from $1.00 for the shortest, local trips to $2.50 for the longest regional trips (note: fares are expected to increase soon). The vast majority of NCTPA's vehicles are diesel transit buses (35' or 40') or cut-a-ways, but they anticipate purchasing four over-the-road coaches for new express service to Vallejo (scheduled for FY 06-07).

The following are potentially useful results from NCTPA's previous onboard survey, conducted in December 2003:

- **Transfer behavior.** Of those surveyed on all routes, roughly 40% needed to transfer to complete their trip. This was roughly the same rate experience by Route 10 (34%).
- **Stop access.** The majority of passengers (74%) walk to get to their boarding stop. Approximately 15% of passengers drove to, or were dropped off at their bus stop. Passengers of Route 10 were somewhat more likely (20%) to access their stop with a vehicle than passengers of the entire system.
- **Passenger characteristics.** Passengers of Route 10 have characteristics fairly similar to the general ridership. Of all survey respondents, 32% have an annual household income less than $25,000 and 5% have an income over $75,000. Respondents identified themselves as Hispanic (42%), Caucasian (29%), African American (6%), Asian or Pacific Islander (5%), Native American (4%) and 22% had a different ethnic identification or chose not to answer the question. A large share of riders is Spanish speaking, as evidenced by the fact that roughly one third of the surveys were completed in Spanish.
- **Interest in service to Fairfield**. 31% of those surveyed indicated that they would regularly use service to Fairfield if it were offered.
- **Bus stop amenities.** The lowest ranked service attribute was the availability of shelters and/or protection from the elements, suggesting that it will be important that any new stops associated with the SR-12 service have adequate bus stop amenities.

Rio Vista Transit

Rio Vista Transit operates general public, dial-a-ride service within Rio Vista and to a number of regional destinations, including Fairfield, Antioch, Lodi, and Vacaville. Service operates Monday through Friday, from 8:30 AM to 5:00 PM. Fares range from $1.25 for trips within Rio Vista up to $7 for the longest regional trips. Due in part to the limited amount of service, most passengers of Rio Vista Transit can be considered transportation disadvantaged.

Rio Vista Transit is in the process of purchasing additional vehicles, which will allow the City to expand the amount of service it provides. Service expansion will likely focus on providing service directly between Trilogy and downtown and on increasing service to high demand destinations. If transit service started on SR-12, Rio Vista Transit would be able to reallocate its resources to provide feeder service to the SR-12 bus stop(s) and increase service to regional destinations to the west, south and east.

In December 2005, the City of Rio Vista acted to implement further changes to Rio Vista Transit in early 2006. The proposed changes include daily mid-day service to Fairfield on a six-month trail basis.

Vallejo Transit

Vallejo Transit operates eight local fixed routes within the city of Vallejo and five intercity routes – Routes 80, 85, 90, 91 and 92. Vallejo Transit also operates the Baylink Ferry and RunAbout, the complementary paratransit service. Most routes operate Monday through Saturday. The exceptions are routes 90 and 91 which only operate on weekdays and routes 80, 85 and 92 which operate seven days a week. Major stop and transfer locations within Vallejo Transit's service area include the York & Marin Transit Center (served by Routes 1, 2, 3, 4, 5, 6, 7, 8, 9, 80 and 85), Sereno Transit Center (served by Routes 1, 2, 5, 80, 85), and Vallejo Ferry Terminal (served by Routes 5, 7, 9, 85 and 92). The intercity routes also serve the El Cerrito del Norte BART station, Suisun City Amtrak Station, Fairfield's Solano Mall, the Fairfield Transportation Center, and the Vacaville Regional Transportation Center.

In response to additional funding generated by Regional Measure 2, which increased the toll on Bay Area bridges by $1, Vallejo Transit made significant service changes in April and July, 2005. Among these changes are increases in service frequency for Routes 80 and 90, new Sunday service on Routes 80 and 85, and the introduction of a new intercity route – Route 92 which operates feeder service to the ferry seven days a week. Like many communities in Solano County, parking for commuters around Vallejo is at a premium. Vallejo Transit is working on redoing its facilities to create a multi-modal station by the ferry terminal that incorporates a bus transfer center and 1,200 parking spaces.

Vallejo Transit uses a zone-based fare structure with general public, cash fares ranging from $1.35 for the shortest, local trips to $5.00 for the longest regional trips. Vallejo Transit uses diesel MCIs for the intercity services.

Other Transit Operators

Eastern Contra Costa Transit Authority (ECCTA) operates Tri Delta Transit within its 225 square mile service area in eastern Contra Costa County, to the south of SR-12. Tri Delta Transit consists of local fixed route transit service, intercity transit routes, and local complementary paratransit service. In addition to eight local routes, Tri Delta Transit operates three intercity routes (Routes 200, 300, 390) and three commuter express routes, the Delta Express which has service to Lawrence Livermore National Labs, Dublin, and Martinez. All routes except three operate Monday through Friday, while the remaining routes operate on weekends and holidays. Major stop and transfer locations within Tri Delta's service area include the Pittsburg/Bay Point BART station, Somersville Towne Center, Los Medanos College, and multiple park and ride facilities. Intercity and express routes also serve the Martinez Amtrak Station and Martinez Court House.

ECCTA has no plans to provide service to Rio Vista or north of its current service area, and no anticipated service changes are expected to impact the planning of transit service along SR-12. Very few passengers come from, or go to, Rio Vista and service requests have been few and far between. However, were the SR-12 service to eventually connect to eastern Contra Costa County, Hillcrest Park and Ride in Antioch would be the most appropriate stop location due to its proximity to Highway 4 and that it is well served by Tri Delta's intercity and express routes.

Tri Delta Transit's current general public, base fare is $1.00. They also use a zone-based fare structure for the Delta Express, with general public, cash fares ranging from $1.50 to $5.00. Most of Tri Delta's vehicle fleet is diesel Gilligs, but diesel MCIs are used for the commuter express service.

Lodi Transit, known as the Grapeline, operates fixed route transit service within the city of Lodi. Grapeline also operates general public and complementary paratransit service within the city. In addition to its five local routes, two intercity routes serve Lodi – Routes 23 and 24 (operated by SJRTD). All local routes operate every day of the week. Major stop and transfer locations within the Grapeline service area include Lodi Transportation Station (served by Amtrak, Sacramento RT, Calaveras Transit, South County Transit, and Greyhound) and the Wal-Mart/Target stop near SR-12. The intercity routes connect to Stockton, Manteca, and Tracy.

Grapeline is not planning any significant fare or service changes in the near future, although they did raise their fares on January 1, 2005. The general public, base cash fare is now $1.00. Although Lodi does not provide transit service beyond its city limits, they do see demand from Rio Vista residents to get to Lodi – particularly for summer entertainment and its medical facilities.

South County Transit (SCT) operates in the southern-most parts of Sacramento County and is based in Galt. In recent years South County Transit has started to serve Lodi and communities along the delta, such as Isleton and Walnut Grove. South County Transit

will be meeting with the Delta Loop Business Association to discuss the possibility of serving the area. If this were to happen, it is conceivable that future SR-12 service could tie into this route, on the east side of the Rio Vista Bridge.

Summary

Conversations with operators within the general vicinity of the SR-12 corridor helped clarify the following issues, which will need to be addressed during the design of transit service along SR-12.

- Multiple operators expect to relocate their primary transit hubs within the next three to five years. If those hubs will be stops, a decision will need to be made as to whether the current or proposed hub will be served.
- No operational changes by area operators are expected to significantly impact the service characteristics of the SR-12 service. The only exception being the possibility of connecting to future South County Transit (SCT) service east of Rio Vista, rather than serving Lodi directly.
- Maximizing accessibility requires stops at major park and ride facilities and major transfer points for local transit service. However, which stops and how many there are, will need to be balanced against the additional time needed to serve them.

Table 1-2, below, lists the transit agencies along, or proximate to, the SR-12 corridor with their major transfer locations, which could be potential stops or provide connecting services to SR-12 transit service.

Table 1-2 Area Transit Services, Major Transfer Locations

Community -Transit System	Major Transfer Locations & Potential Stops
Eastern Contra Costa County Transit District - Tri-Delta Transit	Hillcrest Park & Ride Los Medanos College Pittsburg/Bay Point BART Station
Fairfield/Suisun City – Fairfield/Suisun Transit	Fairfield Transportation Center Solano Mall Suisun City Train Station
Galt – South Sacramento County Transit – South County Transit (SCT)/Link	Lodi Station Isleton
Lodi – Grapeline	Lodi Station Wal-Mart and Target stores - off Hwy 12 at Lower Sacramento Road
Napa County – VINE	Pearl Street Transit Center Napa Valley College South Napa Marketplace Ferry Terminal (Vallejo) York and Marin Transfer Center
Vallejo - Vallejo Transit	Solano Mall York/Marin Transit Center Sereno Transit Center
Rio Vista Transit	Isleton Rio Vista Fairfield Transportation Center

Sources: *Rio Vista Transit Study* (2005) and consultant research.

Table 1-3 lists the intercity routes operating in the vicinity of the SR-12 corridor (or routes that could potentially connect with SR 12 transit service such as Vallejo Transit Route 91 and the Vine Route 10 in Napa County) and their productivity in FY 2003-04. In this case, the average productivity for these intercity routes was 11.47 passengers per hour, with a low of 6.4 (Tri Delta Transit Route 200) and a high of 18.9 (Vallejo Transit Route 91).

Table 1-3 Intercity Transit Routes and Productivity, FY 03-04

Operator	Route	Productivity (passengers/revenue hour)
ECCTA	200	6.4
	300	9.8
	390	13.2
FST	20	14.4
	30	6.5
	40	6.7
NCTPA	10	11.3
Vallejo*	85	12.8
	90	14.7
	91	18.9
Average		**11.47**

* Values for FY 02-03.
Sources: Transit operators and *STA I-80/I-680/I-780 Transit Corridor Study*.

1.4 Service Area Characteristics

The SR-12 corridor runs in a primarily east-west direction through the southern portions of Solano and Napa counties, continuing on to Sacramento and San Joaquin Counties in the east and Sonoma County in the west. Communities proximate to SR-12 in Napa and Solano Counties include Napa, Fairfield, Suisun City and Rio Vista. Stretching from the city of Napa in the east, to Rio Vista in the west, the SR-12 corridor measures approximately 40 miles.

Vallejo is the largest city in Solano and Napa Counties with a 2005 population of 121,221. The populations of other municipalities in or near the corridor are displayed in Table 1-4. The city of Napa is the main urban center of Napa County, as much of the rest of the county is dedicated to agricultural and viticultural uses. The total population of Napa County, at 133,294 totals less than twice that of the city of Napa. By contrast, Solano County is comprised of several municipalities of substantial size, particularly Vallejo and Fairfield.

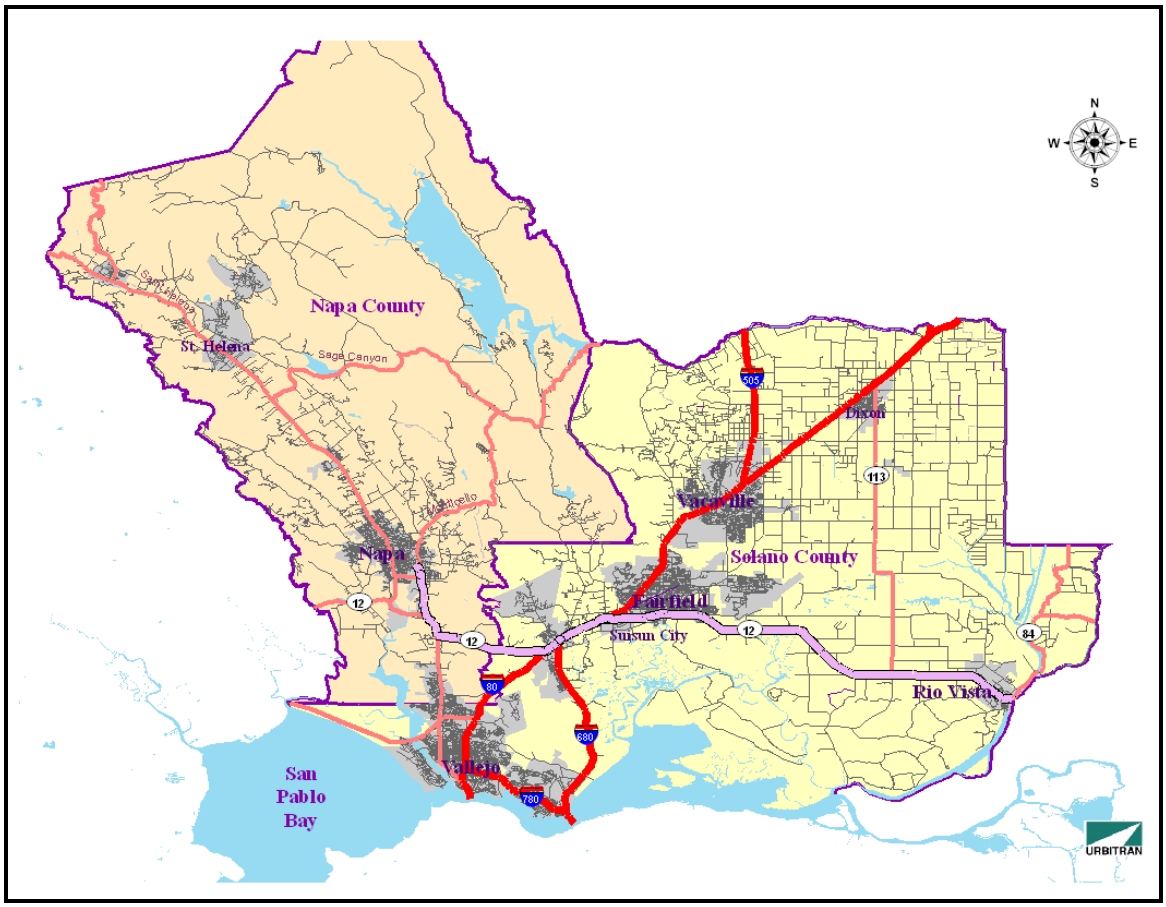
Table 1-4 Population of Selected Napa and Solano Municipalities (2005)

Municipality	2005 Population
Fairfield	105,026
Napa	76,346
Suisun City	27,716
Rio Vista	6,837

Source: California Department of Finance

Rising housing prices in the Bay Area have led to the dispersion of workers to the distant reaches of the metropolitan area, far from major employment destinations such as San Francisco and Oakland. This dispersion has fueled the growth of Napa and Solano counties, which both have a notable share of commuters traveling to the large urban centers in the Bay Area. However, both counties also offer a broad employment base, which has led to additional commuter traffic on SR-12 and other east-west arterials. A map of the two counties and their road network is found in Figure 1-1.

Figure 1-1 Napa and Solano County Base Map



Corridor Demographic Features

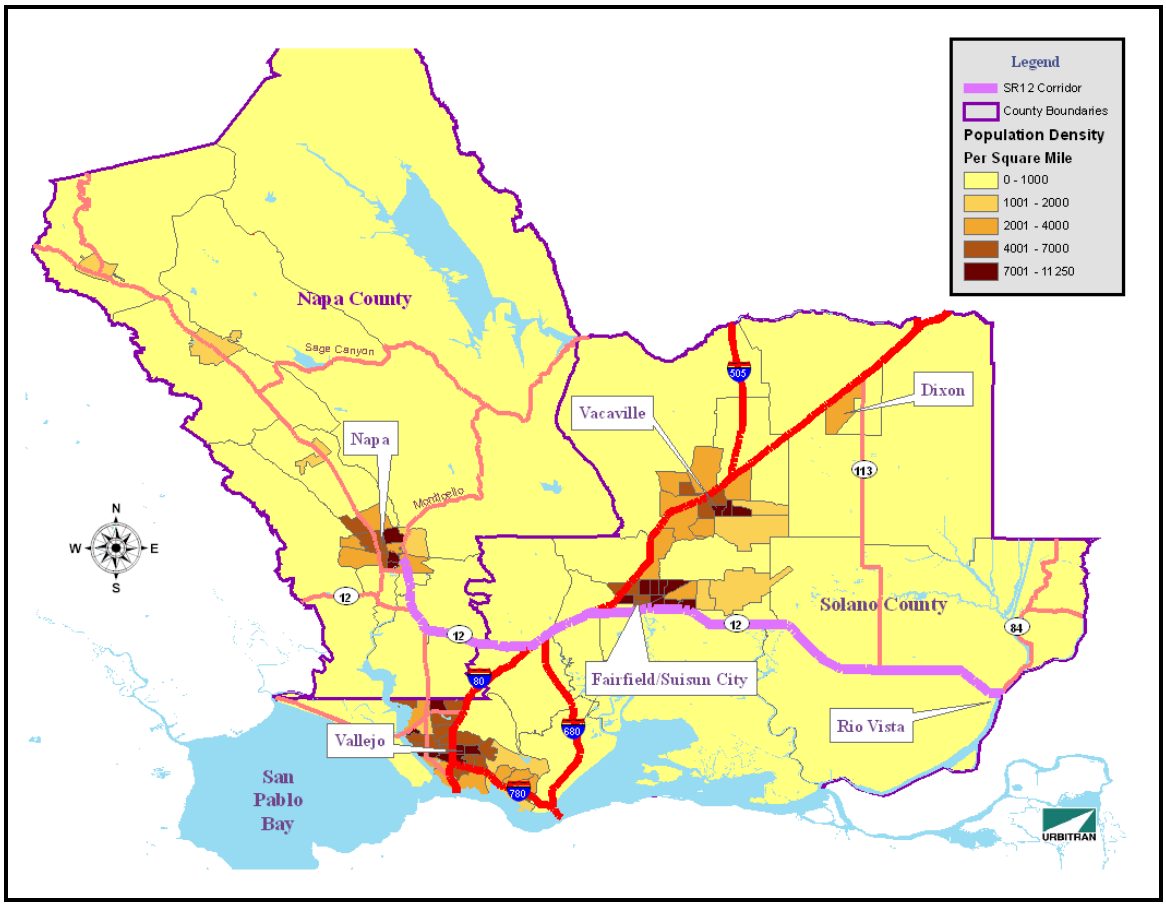
In this section a broad range of data relevant to transit service in the SR-12 corridor are discussed, including population density and socioeconomic characteristics.

a. Population Density

Census 2000 calculates that the population density of Napa County is 164.9 individuals per square mile, less than the statewide average of 217.2. With a population density of over 4,100 per square mile, the city of Napa is clearly the population center of the county. By contrast, 475.8 persons per square mile reside in Solano County, making it over two times denser than Napa County. This population is concentrated in the county's urban centers, particularly Vallejo (3,868 per square mile) and Suisun City (6,511).

Population density by census tract in the SR-12 corridor is mapped in Figure 1-2. As the map illustrates, densities are highest in the urban centers of Vallejo, Fairfield, Suisun City, Vacaville and Napa.

Figure 1-2 Population Density, by Census Tract (2000)



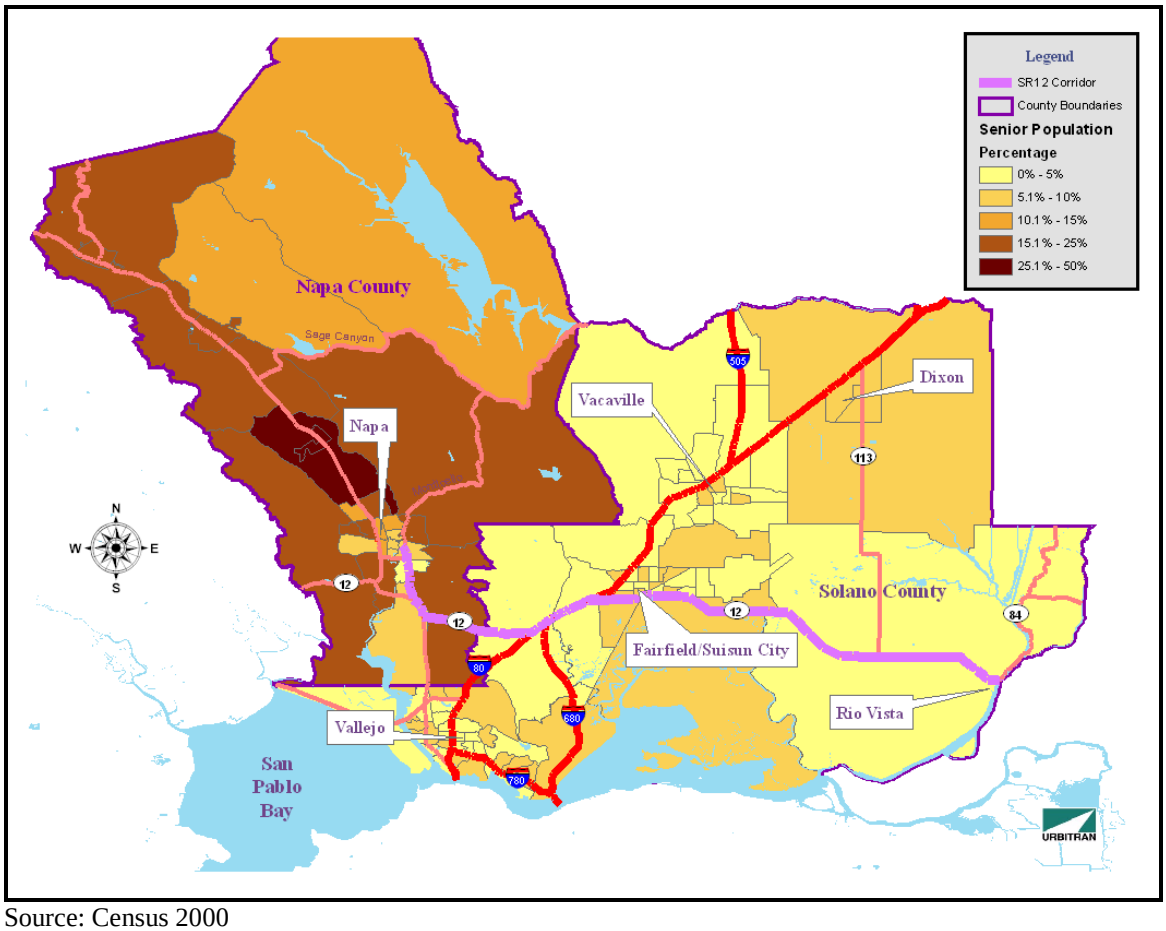
Source: Census 2000

b. Senior Citizen Population

New transit service along the SR-12 corridor is likely to focus on serving commuters, but as a new service would likely draw from other demographic groups as well. The senior citizen community is a subpopulation with a high propensity to utilize transit in general, due to both to their limited driving capabilities and the concentration of some seniors in assisted living facilities. A particularly high percentage of senior citizens is found in Napa County, where 15.4% of the population is 65 or older, significantly higher than the statewide percentage of 10.6%. At 9.6%, the figure is lower in Solano County. The percentage of senior citizens by census tract is shown in Figure 1-3.

As depicted in Figure 1-3, senior citizens comprise greater percentages in the center portion of Napa County, north of the city of Napa. However, percentages are much lower in the vicinity of the SR-12 corridor, particularly in Solano County. Thus, the senior citizen market is not likely to be a significant proportion of the market for transit service in the corridor.

Figure 1-3 Percentage of Senior Citizens, by Census Tract (2000)



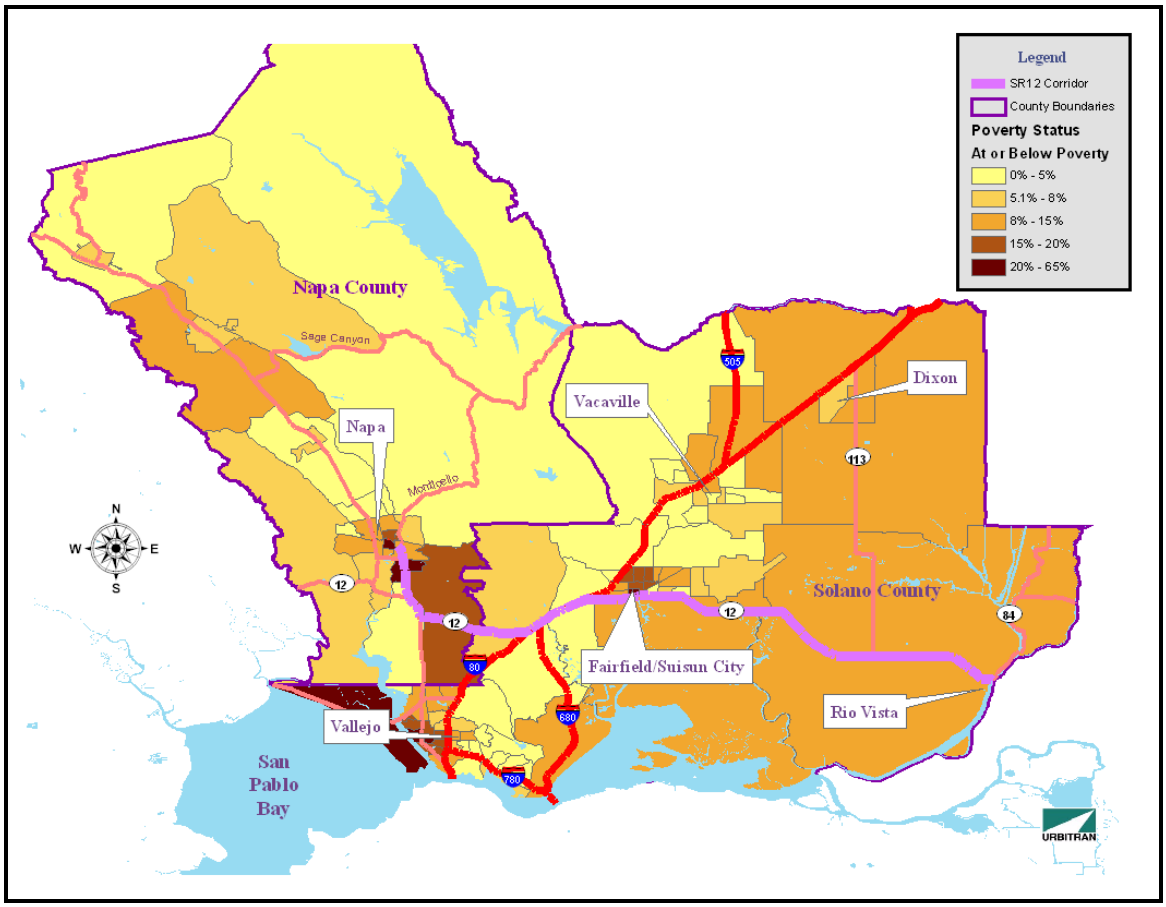
Source: Census 2000

c. Population Living in Poverty

Individuals living at or below the poverty level are another group more inclined than the average person to utilize transit service. Census data show that both Napa and Solano had 8.3% of their populations living in poverty in 1999, well below the statewide average of

14.2%. A map of the percentage of census tract residents living in poverty in the two counties is found in Figure 1-4. As the figure shows, census tracts near or adjacent to the SR-12 corridor often have higher percentages of residents in poverty than the county average, particularly in Solano County and the city of Napa. Poverty percentages tend to be lowest in the northeastern portion of Napa County.

Figure 1-4 Percentage of Residents in Poverty, by Census Tract (2000)



Source: Census 2000

1.5 Population and Employment Projections

Future increases in population and employment are expected to intensify traffic congestion problems in the SR-12 corridor. The Association of Bay Area Governments (ABAG) establishes projections of these demographic indicators to the year 2030 for all Bay Area counties. Population projections for the two counties, and for the city of Napa, Fairfield, Suisun City and Rio Vista are displayed in Table 1-5. Projections for Fairfield, Suisun City and Rio Vista are based on the "sphere of influence" which includes the municipal boundary and any surrounding areas ABAG expects each city might annex in the near future. In the case of the city of Napa, the boundaries used in ABAG's projections extend beyond those defined in the census, which results in a small variation between their respective population counts.

Population in the city of Napa and Napa County is projected to undergo the most moderate increase in the study area, to 91,500 and 153,400, respectively, by 2030. By contrast, Rio Vista's population is expected to increase from 6,837in 2005 to 23,000 in 2030, a 236% increase. Solano County as a whole is also projected to grow significantly in the next 25 years, to a total population of 581,800, a 39% increase.

Table 1-5 Projected Area Population, 2005 to 2030

	Year						% Change 2005 to 2030
	2005	**2010**	**2015**	**2020**	**2025**	**2030**	
Napa	76,346	82,800	85,700	87,700	89,800	91,500	20%
Napa County	**133,294**	**139,700**	**144,800**	**148,100**	**151,100**	**153,400**	**15%**
Fairfield	105,026	119,600	130,500	136,800	142,500	147,500	43%
Rio Vista	6,837	11,700	14,900	17,500	20,200	23,000	236%
Suisun City	27,716	31,900	33,800	35,400	37,000	38,600	39%
Solano County	**421,657**	**466,100**	**504,500**	**532,400**	**558,100**	**581,800**	**38%**

Sources: California Department of Finance (Year 2005)
Association of Bay Area Governments, *Projections 2005.* (Years 2010-2030)

ABAG projections for job growth in Napa and Solano Counties are presented in Table 1-6. In line with the steep population increases there, jobs in Rio Vista are projected to increase 132% to 5,650 by 2030. Significant job growth is also anticipated in Fairfield, with an increase of 48% by 2030, and the same rate of increase for Solano County as a whole. While still significant, employment growth is not expected to rise as markedly in Napa County, where 91,920 jobs are projected for 2030. At present, roughly half the jobs in Napa County are located in the city of Napa, and that ratio is maintained in 2030, with employment growing in the city of Napa by 26%, to 45,510.

Table 1-6 Projected Area Jobs, 2005 to 2030

	Year						% Change 2005 to 2030
	2005	**2010**	**2015**	**2020**	**2025**	**2030**	
Napa	36,150	39,040	41,610	43,370	44,560	45,510	26%
Napa County	**72,150**	**78,000**	**82,930**	**86,910**	**89,530**	**91,920**	**27%**
Fairfield	49,960	56,940	56,440	61,560	67,390	74,120	48%
Rio Vista	2,440	2,690	3,580	4,310	5,000	5,650	132%
Suisun City	4,060	4,990	6,220	6,590	6,890	6,890	70%
Solano County	**148,640**	**162,390**	**175,900**	**189,450**	**203,460**	**217,910**	**47%**

Source: Association of Bay Area Governments, *Projections 2005.*

Table 1-7 shows the ABAG projections of the number of employed residents in the areas discussed above. The 205% increase in employed residents projected in Rio Vista for 2030 is similar to the increase in total population in Table 1-5. However, the ratio of jobs to employed residents in Rio Vista is expected to decrease in Rio Vista over time. It can be inferred from this that commuters will likely be driving from Rio Vista to other cities in greater numbers in the coming years. A similar, though smaller, jobs-to-employed residents decrease is projected for the city of Napa and Napa County. Thus, the projected increases in commuting over the next 25 years are expected to be higher at the western and eastern ends of the SR-12 corridor.

Table 1-7 Projected Employed Residents, 2005 To 2030

	Year						% Change 2005 to 2030
	2005	**2010**	**2015**	**2020**	**2025**	**2030**	
Napa	38,670	41,860	45,110	48,130	52,310	56,430	46%
Napa County	64,100	70,000	75,520	80,480	87,190	93,700	46%
Fairfield	49,190	54,480	58,870	62,220	65,430	68,920	40%
Rio Vista	3,200	4,990	6,290	7,450	8,570	9,750	205%
Suisun City	13,600	15,020	15,760	16,640	17,550	18,610	37%
Solano County	194,900	211,400	226,500	240,900	254,700	269,800	38%

Source: Association of Bay Area Governments, "Projections 2005"

1.6 Transit Needs Indicators

Demand along the SR-12 corridor is most closely identified with daily commuters. Thus, this discussion of transit needs indicators focuses on data related to auto ownership and commuting habits. These indicators provide a demographic baseline for evaluating the feasibility of new service along the SR-12 corridor.

a. Commuters Driving Alone

Consistent with most suburban areas, the vast majority of commuters in the two counties travel to work by automobile, and most of these commuters drive alone. A decrease in the number of solo commuters would be a chief goal of transit service along the SR-12 corridor. Based on Commute Profile 2004, 71% of Solano residents and 79% of Napa residents drove alone as their primary commute mode.

b. Carpooling Commuters

Compared to solo drivers, carpooling commuters have already exhibited a preference for minimizing cost and/or inconvenience in their commutes. As such, these commuters represent a ripe market for transit service. According to Commute Profile 2004, the percentage of residents who carpool is significant in Napa and Solano County. Solano has the highest rate of carpooling (22%) in the Bay Area and Napa County has a carpool rate of 15%. In general, the percentage of carpoolers runs higher in the larger communities,

attributable in part to the greater numbers of commuters traveling long distances to San Francisco, Oakland and other job centers. This is particularly the case in Vallejo, where carpoolers constitute over 20% of total commuters in numerous census tracts.

c. Zero-Vehicle Households

To an even greater degree than carpoolers, households without access to an automobile are typically dependent on transit for commuting. Zero-vehicle households are thus a strong indicator of transit need. In scattered census tracts around the city of Napa, Fairfield and Vallejo, there are instances of carless household densities above five per square mile. Otherwise, car-less households appear to be quite sparse throughout the corridor.

1.7. Commuting Behavior

Many of the cities within the SR-12 corridor are centers of both employment and residence. Although not as large as commuting volumes to employment centers to the south and west, there are a significant number of work commutes within the corridor. The incidence of corridor residents commuting between cities in the corridor is tabulated in Tables 1-8 and 1-9, with intra-city commutes excluded. This data is derived from the Napa/Solano Travel Demand Model (Phase 1). Selected Travel Model data was presented as a list of SR-12 origins and destinations with associated traffic volumes. By multiplying the traffic volume to a given destination by the percentage of total volume traveling from a given origin, it is possible to isolate the number of vehicle trips likely to occur in each direction between the origin-destination pairs relevant to the transit corridor (e.g. Rio Vista to Suisun City), as shown in Tables 1-8 and 1-9.

These tables show the projected traffic volume between two locations in the corridor during the AM peak hour, defined in the Napa/Solano Travel Model as 7:15 AM to 8:15 AM. Westbound travel is the source of greater traffic volumes that eastbound travel, with most of the popular origin-destination pairs between Fairfield and Napa. The highest-volume pair in the corridor is the westbound trip between Fairfield and Napa, with 359 vehicles during the peak hour. 225 vehicles are projected to travel in the opposite direction between these locations.

Given the population and employment projections described in Section 1.5, it is reasonable to assume that commuting trips along the SR-12 corridor will increase notably in the future. In particular, commutes with the growing community of Rio Vista as either the origin or destination are likely to undergo increases, as they currently represent about 19% of all the projected a.m. and p.m. peak hour trips generated in the combined zones adjacent to SR 12 as described in Tables 1-8 and 1-9.

Table 1-8 2030 Commuting Volumes for SR-12 Corridor Westbound AM Peak Hour Trips

Origin	Destination	Westbound Peak Hour
Fairfield	Napa	359
Rio Vista	Fairfield	71
Suisun City	Napa	142

Rio Vista	Suisun City	47
Rio Vista	Napa	26
TOTAL		645

Table 1-9 2030 Commuting Volumes for SR-12 Corridor Eastbound AM Peak Hour Trips

Origin	Destination	Eastbound Peak Hour
Napa	Fairfield	225
Fairfield	Rio Vista	30
Napa	Suisun City	32
Suisun City	Rio Vista	4
Napa	Rio Vista	5
TOTAL		296

The traffic volumes presented in Tables 1-8 and 1-9 are utilized to develop ridership projections for SR-12 transit service in the Service Plan section of this study.

1.8 Major Trip Generators

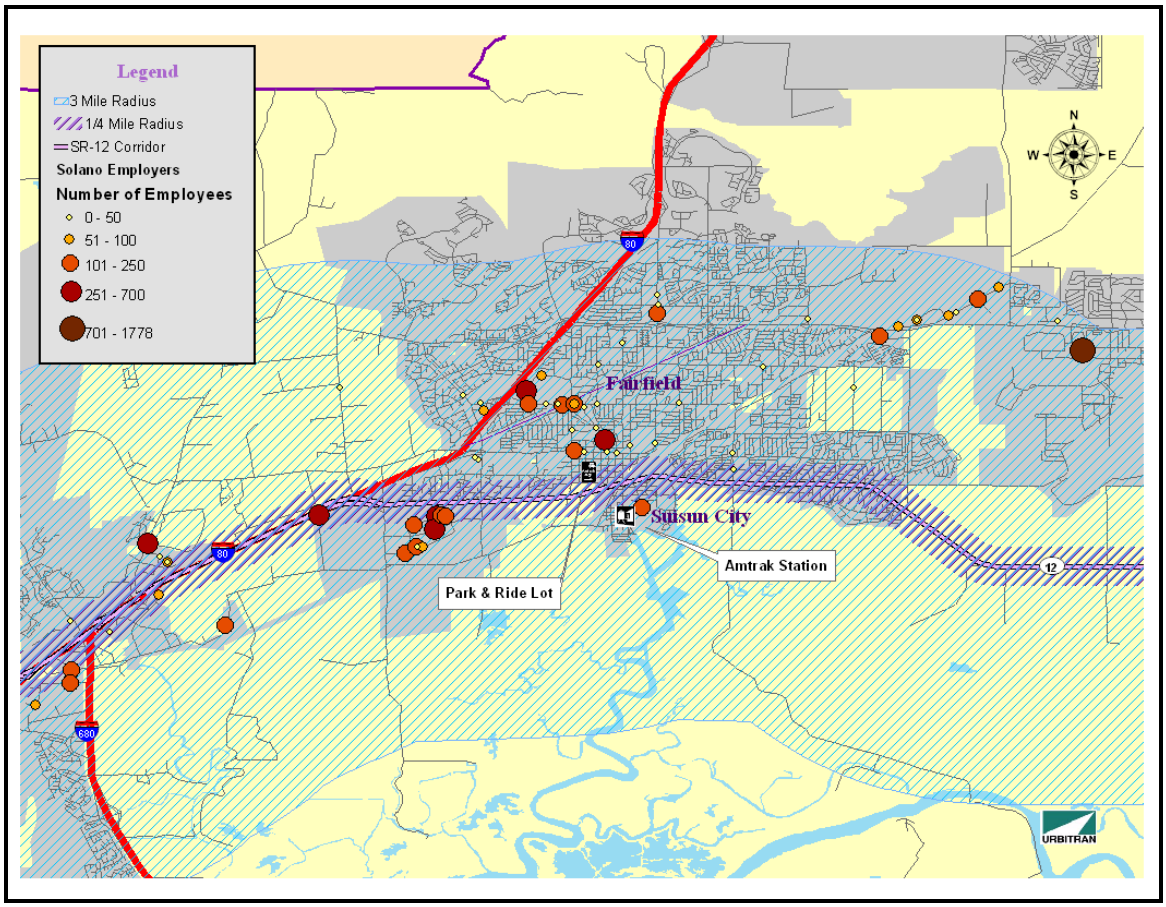
The SR-12 corridor offers the greatest potential as a transit corridor for daily commuters traveling east to west through Napa and Solano Counties. The trip generators for commuter service would primarily consist of large employers in the two counties and multimodal transportation hubs that link local transit service. The largest employers with employment facilities located along the SR 12 Corridor are generally institutional in both counties, such as Travis Air Force Base (15,000 military and civilian employees), County of Solano (1,900 employees), and Napa State Hospital (1,778); most of these numerous locations throughout the county. Large private employers include Robert Mondavi Winery (1,000 employees), Dey Laboratories (700) and Anheuser-Busch (526). A list of employers within three miles of the corridor with workforces over 250 persons is found in Table 1-10.

The distribution of worksites in the Fairfield/Suisun City area is depicted in Figure 1-5. Their locations are compared to the one-quarter mile radius (for pedestrians) and three-mile radius (for drivers) around the SR-12 corridor. Only a handful of employers are located within walking radius of the corridor. However, nearly all of the employers in this part of the corridor fall within a three-mile radius, particularly area hospitals. Thus, in many cases, local transit connections provided by Fairfield/Suisun Transit could connect these employers to the SR-12 corridor.

Table 1-10 Major Employers within Three Miles of the SR-12 Corridor

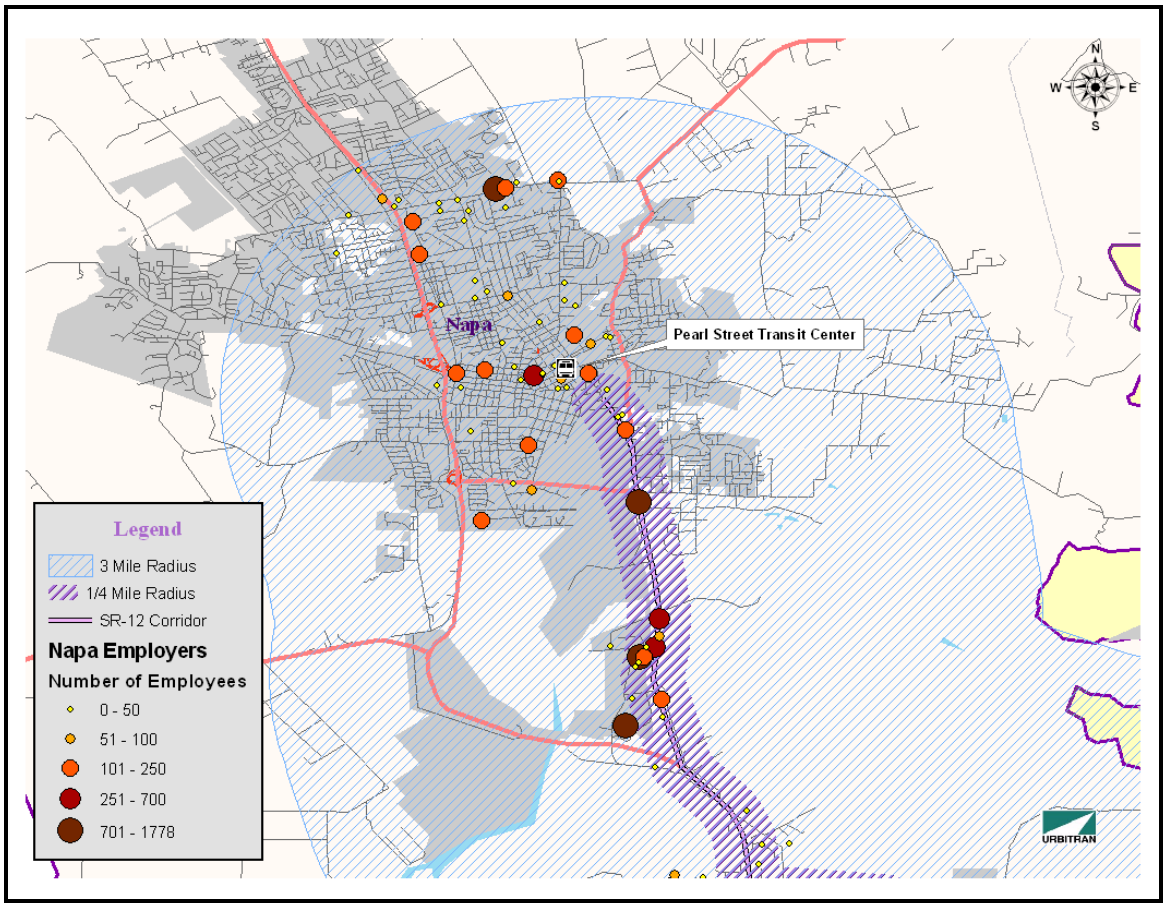
Company Name	Street Address	City	Est. Number of On-site Employees
Travis Air Force Base	East end of Air Base Parkway	Travis AFB	15,000
Solano Co. Gov. Center, Courts, and Health and Social Services	675 Texas Street 500, 530 Union Street 275 Beck Avenue/Courage Way	Fairfield	1,900
Napa State Hospital	2100 Napa Vallejo Highway	Napa	1,778
Queen of the Valley Hospital	1000 Trancas Street	Napa	1,264
County of Napa	1195 Third Street	Napa	1,000
Robert Mondavi Winery	831 Latour Court	Napa	1,000
Mondavi Winery	687 Technology Way	Napa	1,000
Dey Laboratories	2751 Napa Valley Corporate Drive	Napa	700
Solano Community College	4000 Suisun Valley Road	Fairfield	631
Sutter Home Winery	535 Airpark Road	Napa	575
Anheuser-Busch	3101 Busch Drive	Fairfield	526
Herman Goelitz Candy Company	2400 North Watney Way	Fairfield	420
Pride Industries	2339 Courage Drive	Fairfield	400
Napa Valley College	2277 Napa Vallejo Highway	Napa	375
Kaiser Medical Center	1550 Gateway Boulevard	Fairfield	370
River Delta Unified School District	445 Montezuma Street	Rio Vista	270
Macy's - Fairfield	1544 Travis Boulevard	Fairfield	250

Figure 1-5 Major Trip Generators in Fairfield/Suisun Area



A map plotting the locations of Napa employers is found in Figure 1-6. In this figure, the SR-12 corridor terminates on Soscol Avenue in downtown Napa. The western terminus of the corridor has not been determined as of yet, but for the purposes of analysis a Downtown Napa terminus was utilized. Similar to Figure 1-5, Figure 1-6 shows one-quarter mile and three mile buffers around the SR-12 corridor. As in Figure 1-5, the Napa Valley Unified School District is not mapped due to a lack of school-by-school employment data. A significant cluster of employers falls within or near the quarter-mile radius, particularly in the corporate parks west of Highway 29. The three mile radius encompasses much of the central Napa area, which is served by Napa VINE. The local routes operated by Napa VINE all connect at the Pearl Street Transit Center in downtown Napa.

Figure 1-6 Major Trip Generators in Napa Area



1.9 Demographics and Transit Needs Summary

The previous analysis examined population and demographic characteristics of Napa and Solano Counties, with a focus on the SR-12 corridor. Some of the most important findings are listed below.

- Within the SR-12 corridor, the highest population densities are found in downtown Napa and northeast of the I-80/I-680/SR-12 interchange in Fairfield.
- Individuals living in poverty are found in higher concentrations in the city of Napa and along the SR 12 corridor in Solano County than the county averages.
- Population growth is expected to be highest in Solano County, with above average growth rates in Rio Vista and Fairfield.
- Job growth over the next 25 years will cause higher shares of residents from the eastern (Rio Vista) and western (city of Napa) ends of the corridor to commute to another community to work, while those in Fairfield/Suisun could be commuting elsewhere in smaller proportions.

- The largest commute pool will be for residents commuting from Fairfield to Napa and from Suisun City to Napa. In the future, growth in Rio Vista is likely to increase the share of corridor commuters traveling west from Rio Vista.
- Most of the largest trip generators in Napa and the Fairfield/Suisun area are within a 3-mile buffer of SR-12. In Napa County, a significant number of these employers are within a reasonable walking distance of ¼ mile.

When considered together, results from the previous studies, transit plans, and current and projected growth patterns will help provide the background for subsequent steps in the planning process – namely determining the operating characteristics of transit service along SR-12.

CHAPTER TWO PROPOSED SERVICE PLAN

The proposed service plan built upon the information contained in the prior chapter; relevant findings from recent plans and studies, information on area transit operations and specifically intercity routes, and the demographic characteristics of, and travel behavior in, Solano and Napa Counties. The primary purpose of this service plan is to provide sufficient information regarding potential service alternatives, such as termini, routing, frequency, span of service, etc. to generate feedback through the public review process which will result in fine tuning for the final product. For example, it would appear that the initial route (Phase 1) would consist of one distinct phase or segment: Suisun City/Fairfield to Napa. Evaluating this segment, the study developed operational recommendations that will benefit from input from the affected agencies and the potential users and will shape the final service plan.

The study targeted the implementation for Phase 1 and 2 (the extension to Rio Vista) of the service to commence as soon as the development of a final funding plan could be completed, including vehicle acquisition options. These first two phases would also coincide with or follow the completion of the easterly and central segments of the North Connector Road (from Abernathy Road to Suisun Valley Road), the SR 12 safety projects and the Jamison Canyon Truck Climbing Lane project. The North Connector project will offer improved routing options through Fairfield, providing surface street options to access Solano Community College in lieu of traveling on a portion of I-80 that often is congested during the peak periods due to merging traffic, including significant truck traffic. The SR 12 safety project will add shoulders and remove many of the existing hills and dips along the unincorporated portion of the corridor between Rio Vista and Suisun City. The truck-climbing lane will provide a westbound lane for trucks on SR 12 from I-80 to a point just west of Red Top Road.

The Proposed Service Plan is based on input from the public involvement process, as well as the receipt of travel demand data derived from the recently completed Solano/Napa Travel Demand Model (Phase 1).

It is noted that one of the refinements undertaken during the development of the prior chapter was to incorporate the most recent modeling work in the Solano/Napa Travel Demand Model to provide information regarding potential ridership. There are two major benefits to this modification. First, it ensures consistency between work being generated for the corridor improvements, thus eliminating the sense there are separate sources of data. Second, it also provides the most recent forecast information in a similar horizon time period, through the year 2030.

OPERATIONAL PARAMETERS

The following sections describe the various operational elements of a service plan. The operational guidelines for a new transit service operating primarily within the SR-12 corridor are presented in this chapter. The following sections include the potential

characteristics of the service, with estimated ridership, service phasing and cost estimates. Each section describes the parameters of SR-12 transit service, and concludes with a discussion of the issues to be resolved through public involvement and additional analysis. These sections include:

- Service phasing
- Public input
- Hours of service
- Route alignment and proposed bus stop locations
- Frequency of service and schedules
- Ridership demand analysis
- Service integration and coordination
- Paratransit impacts

2.1 Service Phasing

In order to address cost concerns and encourage the long-term success of SR-12 service, this service plan proposes transit service in the corridor in three distinct phases. Phase 1 introduces commuter service between Suisun City Amtrak Station and the Napa VINE Transportation Center with limited midday service. In Phase 2, service is extended east of Suisun City to serve Rio Vista. Phase 3 sees an increase in both peak period and off-peak service, also between Rio Vista, Suisun City, Fairfield, and Napa. The characteristics of the three phases are described in further detail in the following sections.

Phases 1 and 2 are expected to commence during the next few years, during which time commute volumes along SR-12 are projected to increase. Residential and commercial development of Rio Vista is also expected to continue apace, thereby eventually creating sufficient commuter demand to support fixed route transit service. Service phasing could potentially be accelerated in conjunction with the passage of a sales tax measure or the availability of other funding sources.

Based upon coordination with other transit agencies and the identification of potential transit demand, service could in the longer term extend to serve Lodi in San Joaquin County, the Pittsburg/Bay Point BART terminus in Contra Costa County, or destinations in the Sacramento corridor. For the purposes of a three-phased plan, however, service only between downtown Napa and Rio Vista is discussed in this study.

2.2 Public Input

Public input was received in meetings at the Napa County Airport on June 27, 2005, Rio Vista City Hall on June 28, 2005 and at Solano Community College on August 29, 2005. Attendance at the meetings in Napa and Rio Vista each included between 15-25 attendees, with a mixture of both community stakeholders and citizens. Solano community College had about 6 persons in attendance. All meetings consisted of a presentation by the consultant of a preliminary version of this plan, followed by a

question-and-answer session. Some comments from these meetings are listed in Appendix A.

2.3 Hours of Service

As discussed in the prior studies and reports, the primary purpose for the proposed service is to provide commuter service along the SR-12 corridor, meeting a growing travel demand between Napa and Fairfield/Suisun. As will be discussed subsequently, there also are potential opportunities to connect communities and additional destination points during the off-peak period and ultimately there may be other connections to the east and south of Rio Vista.

As models for the development of the service plan, the study incorporated prior work done for other agencies in similar settings with the basic operational components of Fairfield Suisun Transit Route 30, which provides service to Davis and Sacramento. The primary preliminary route design would consist of bus service between approximately 5 AM and 8 PM, with more service in the peak commute hours than in the midday period. Service span would increase slightly with each successive implementation phase. The service would initially operate only on weekdays. The proposed service schedule expands upon these general parameters to show the service hours in each of the three proposed phases of the service.

The starting time of the service would logically be linked to connecting residents of one jurisdiction with work locations in another. Through the public involvement process (particularly from the business representatives attending the Napa public meeting on June 27, 2005 and from subsequent discussions with certain employers), the project team received input from major employers with regard to shift times and potential employee demand.

2.4 Route Alignment and Proposed Bus Stop Locations

As it is the only major through route between Napa and Solano Counties in the east-west direction, SR-12 naturally comprises a large portion of the alignment of a service between the two counties. SR-12 corridor service is viewed mainly as a commuter service, but the route would serve a wider array of destinations during the off-peak period, at decreased frequency. The service is designed to provide direct connections to major worksites and intermodal transfer locations during the peak period, and to connect to shopping, educational and other uses during the midday. As discussed below, utilizing current transit connections such as the Fairfield Transportation Center and the Suisun Amtrak Station, as well as connections with the NAPA VINE Route 10, augments existing transit use by providing better connectivity.

Phase 1 would consist of transit service between the Napa VINE Transit Center in Downtown Napa and the Suisun City Amtrak Station. In Phase 2, service would extend to

to Church Road/SR 12 in Rio Vista. The proposed list of stops during the peak and off-peak periods presented in Tables 2-1 and 2-2 reflect this phasing plan.

Table 2-1 Proposed SR-12 Stop List, Peak Period

Peak Period Stops
Napa VINE Transportation Center
Napa State Hospital
Napa Corporate Park
Napa Airport Industrial Park
Red Top Road Park and Ride Lot[1]
Fairfield Transportation Center
Solano County Government Center and Courts
Suisun City Amtrak Station
Church Road, Rio Vista[1]

[1] Phases 2 and 3

Table 2-2 Proposed SR-12 Stop List, Off-Peak

Off-Peak Stops
Napa VINE Transportation Center
South Napa Marketplace Shopping Center
Napa State Hospital
Napa Valley College
Napa Airport Industrial Park
Napa Corporate Park
Solano Community College
Fairfield Transportation Center
Jelly Belly Candy Factory[2]
Solano County Health and Social Services Dept.
Suisun City Amtrak Station
Western Railway Museum (flag stop only) [2]
Church Road, Rio Vista[1]

[1] Phases 2 and 3 .
[2] Phase 3 only.

Many of these stops were identified in the development of the first Technical Memorandum as sites of significant employment or educational activity. Connections to significant transfer facilities (Fairfield Transportation Center, Suisun City Amtrak Station, Napa VINE Transportation Center) and retail destinations (South Napa Marketplace) were included as well, in the interest of making the route appeal to both

commuting and general use passengers. Service during the peak hour to the Red Top Road Park and Ride Lot would be dependent upon future construction plans. A connection to Napa Valley College during the peak period is recommended as a means of providing a convenient connection to the Napa VINE Route 10. The nearby Napa State Hospital and Napa Corporate Park would both likely generate employee ridership during the peak periods, and the stop at the Napa Airport Industrial Park would serve the rapidly growing employment base in that area. Solano Community College, on the other hand, is proposed to be served during the off-peak period, as it is unlikely to generate much ridership during the early morning hours and requires a relatively long diversion from the proposed North Connector Road. A stop at Church Road in Rio Vista in Phase 2 of the service would accommodate the significant future residential development anticipated at this location. The Western Railway Museum on SR-12 between Suisun City and Rio Vista would be served only on a flag stop basis during the off-peak period as part of Phase 3.

The route would operate in the peak period primarily on Soscol Avenue, Devlin Road, SR-12, and the proposed North Connector Road which would run north of SR-12 between Green Valley Road and Abernathy Road in Fairfield. Some of the North Connector Road is currently in operation under the name Business Center Drive, while the eastern end of the North Connector Road is anticipated to be completed by 2008. Maps of the proposed peak and off-peak alignments for the service are shown in Figures 2-1 and 2-2, respectively.

Figure 2-1 Proposed Peak-Hour Alignment for SR-12 Transit Service

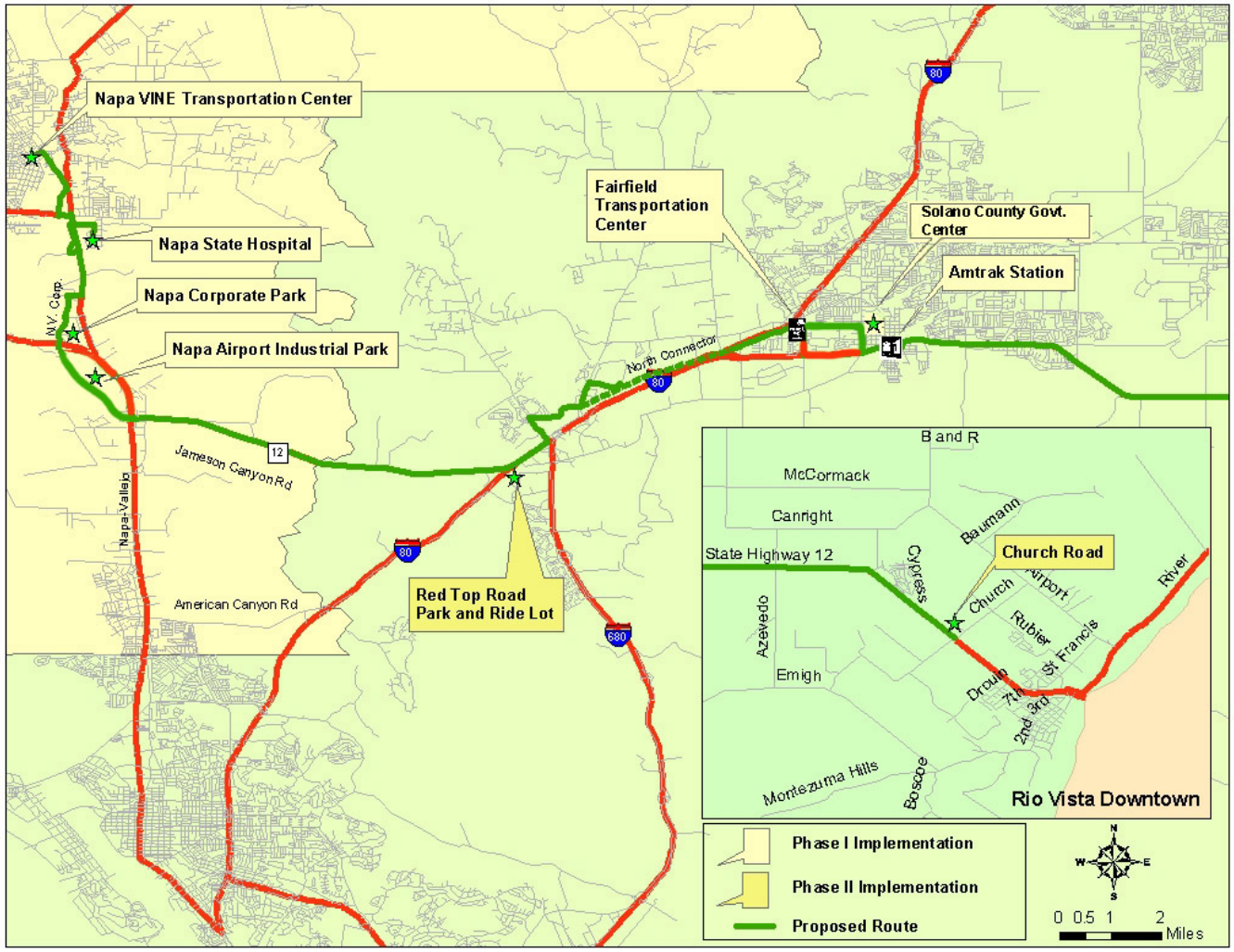
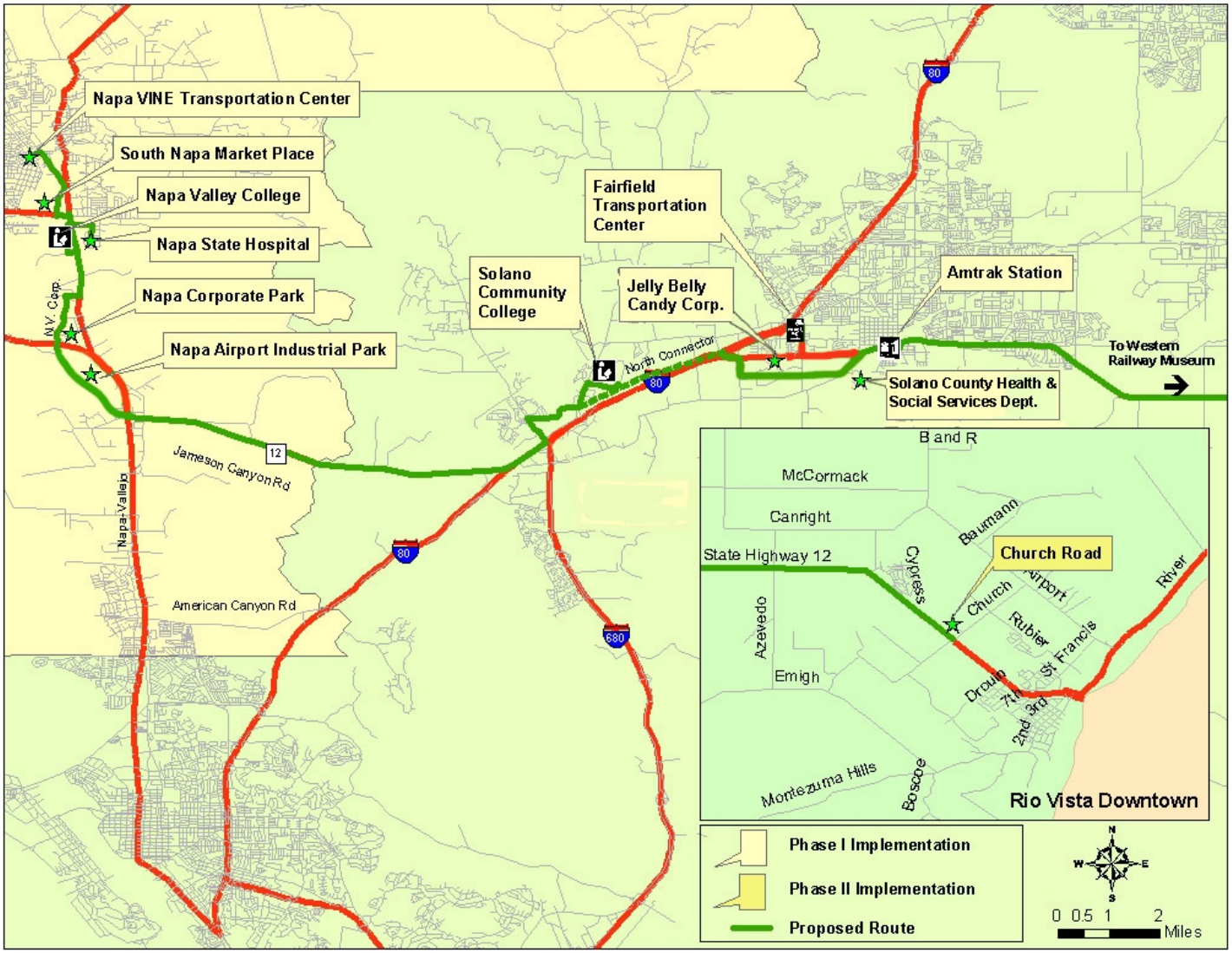


Figure 2-2 Proposed Off-Peak Alignment for SR-12 Transit Service



During preparation of the proposed service plan, input was solicited regarding the feasibility of a southern diversion of the route to American Canyon Road between SR 29 (Napa-Vallejo Highway) and I-80. This diversion was put under consideration because of its potential to improve travel time during the peak period, or to serve as designated alternative during periods of intense congestion or accidents. This diversion would avoid congestion delays that occur during peak periods on the parallel stretch of SR-12 approximately four miles to the north. Fieldwork and opinions offered by agency staff suggest that traffic congestion on SR-12 would have to be significant to justify the additional route miles accrued in the diversion, as well as the perception of out-of-direction service. As such, this diversion is not recommended as part of this service plan. The operational realities of the route upon implementation may however point to the necessity of this diversion.

2.5 Frequency of Service and Schedules

The schedule developed for the preliminary service plan is designed to serve two primary markets: commuters and general use passengers. The primary commute period would be served with two vehicles beginning in Phase 1. In this phase, only one vehicle would operate during the midday period. On the eight daily round trips in Phase 1, six would be distributed throughout the AM and PM peak periods, while two would take place in the off-peak. In the second implementation phase, service would be increased to require two-vehicle operations in the midday. Of the 12 round trips planned for each weekday in Phase 2, eight operate with the peak period service structure geared towards commuters. The remaining four round trips operate within the general use parameters best suited to off-peak service. Detailed sample schedules for the AM peak, off-peak and the PM peak for Phases 1, 2 and 3 are found in Appendix B. Layovers and lunch breaks are built into these schedules, but not the potential impact of delay. If initial improvements to Jameson Canyon (such as the westbound truck climbing lane) have not yet been made before the service is ready to commence, then a more detailed schedule should be developed based on actual observed delays. Further discussions with the existing service operators to obtain their input regarding operational issues prior to the implementation of the actual service should occur. The preliminary running time features of the three service phases are described below.

Phase 1

The peak period service is estimated to operate on a 110-minute cycle time, or 50 minutes in each direction with a five-minute layover at each end. During the off-peak period, the added stops would increase the cycle time to 120 minutes, or 55 minutes in each direction with a five-minute layover at each end. This service frequency should allow ample time for buses to reach stops on an average day, with brief layovers at the end of each run built into the schedule.

Phases 2 and 3

With the addition of service to Rio Vista and an additional peak hour stop at Red Top Road (Phase 2) and additional peak and off-peak period stops included in Phase 3, peak period service is estimated to operate on a 160-minute cycle time, or 75 minutes in each direction with a five-minute layover at each end. During the off-peak period, the added stops would increase the cycle time to 170 minutes, or 80 minutes in each direction with a five-minute layover at each end.

Road tests utilizing the transit vehicles chosen to operate the service would need to be performed to confirm these estimations. Final service schedules should endeavor to provide convenient connections to intersecting transit services. For example, Napa VINE Route 10 offers service further north in Napa County and south to Vallejo, and an effort should be made in the final SR-12 service schedule to facilitate transfers to this route at Napa Valley College or along Devlin Road in the Napa Airport Industrial Park. The proposed SR-12 route alignment would also serve the Fairfield Transportation Center, where it would meet Fairfield/Suisun Transit Routes 3A/3B, 7, 30, 40, and Vallejo Transit Routes 85, 90, 91 and 92. To the greatest extent possible, an effort should be made to offer connections to the long-haul commuter routes serving the Transportation Center, such as the Route 40 to Pleasant Hill BART and Route 30 to Davis and Sacramento. The issue of service integration and coordination with other transit services is discussed in further detail in Section 2.7 of this chapter.

2.6 2030 Ridership Demand Analysis

As Tables 1-8 and 1-9 in Chapter One show, the peak hour traffic volumes projected by the Solano/Napa Travel Model from the section of SR 12 from Rio Vista-Suisun City/Fairfield-Napa (Jameson Canyon) totals a current commute trips (year 2000) of about 537, increasing about 74% to 941 commute passenger trips by 2030 (based only on those traffic analysis zones that include passenger trips originating along or destined to locations immediately adjacent to the SR-12 corridor).

This compares with the current SR-12 traffic volume demand (year 2000) of approximately 2,700 peak hour vehicles, expecting to grow to a total 2030 Travel Model volume of roughly 4,700 in both directions (including a majority of vehicle trips that originate from or are destined to locations beyond the immediate SR 12 Corridor). This would indicate that trips to and from locations within close proximity of this portion of the corridor would amount to approximately one-fifth of total traffic volume, and that the remainder is comprised of through trips to and from the Sacramento and San Joaquin regions to the north and east, and Contra Costa County to the south.

The Napa/Solano Travel Demand Model estimates include commute trips occurring during the AM peak period, from 7:15 AM to 8:15 AM. The Bay Area MTC Travel

Forecast presumes a 2.5% transit mode share[1], which is applied to the traffic volumes derived from the Travel Demand Model for 2030, yielding a three-hour demand of 71 trips. To expand these hourly data out to the full service span, three hours are allocated for the AM peak, three for the PM peak, and nine hours for the off-peak. These allocations are indicative of peak travel demand as established by the MTC Forecast, rather than the proposed service schedules.

It is unlikely that travel demand would remain at peak hour level throughout the day, so a ratio between the AM peak period, the PM peak period and off-peak hours was adopted from the MTC Forecast's trip distribution ratio by time of day.[2] As such, westbound and eastbound ridership are estimated to be 163 and 75 daily passengers, resulting in a total of 238 daily passengers (see Table 2-3) based on 2030 forecasts. Without service to Rio Vista, as would be the case in Phase 1, SR-12 transit ridership is estimated to total 192 daily passengers, as Table 2-4 shows.

Table 2-3: SR-12 Projected 2030 Ridership by Time of Day

(including Rio Vista service)

Time Period	Westbound	Eastbound	Total
AM Peak Period Ridership	48	22	71
Off-Peak Ridership	75	35	110
PM Peak Period Ridership	40	18	58
Total	163	75	238

Table 2-4: SR-12 Projected 2030 Ridership by Time of Day

(without Rio Vista service)

Time Period	Westbound	Eastbound	Total
AM Peak Period Ridership	38	19	57
Off-Peak Ridership	59	30	89
PM Peak Period Ridership	31	16	47
Total	127	65	192

It is not expected that SR-12 transit service would garner the daily ridership projected in Table 2-3 until 2030 since the Travel Demand Model numbers are 2030 forecasts. As

[1] 2.5% represents the average transit mode share for the four income quartiles of home-based work trips in the MTC Forecast. Commute Profile 2004 indicated a 4% transit mode split for Solano County residents.

[2] The trip distribution ratio in the MTC Forecast assumes an off-peak period from 9:00 AM to 3:30 PM and from 6:30 PM to 6:00 AM. The proposed SR-12 service would only operate during half of these 18 hours, but it is safe to assume that daytime hours account for a disproportionately large percentage of off-peak travel demand. Thus, the off-peak trip distribution has been weighted to accommodate the assumption that 75% of the off-peak transit use occurs during those daytime hours.

with most new transit services, over time ridership would increase to the levels projected here. Thus, Table 2-5 shows a Phase 1 ridership of 163 passengers per day, which was indexed downward (to more closely reflect existing travel demand) from the projected Rio Vista- Suisun City-Fairfield- to-Napa ridership of 192 (Phase 2). When Phase 3 service is provided, the daily ridership reaches 238 passengers, or a 24% increase over Phase 2.

Table 2-5-1 SR-12 Base Year 2005 Ridership Demand by Implementation Phase

Implementation Phase	Daily Ridership	Annual Ridership	% Increase from Previous Phase
Phase 1	117	29,718	N/A
Phase 2	139	35,306	18%
Phase 3	147	37,338	6%

1. Annual ridership demand is based on 254 days of service.
2. Current ridership demand (2005) is about 64.1% of year 2030 estimates.

Table 2-5-2 SR-12 Long Range 2030 Ridership Demand by Implementation Phase

Implementation Phase	Daily Ridership	Annual Ridership	% Increase from Previous Phase(s)
Phase 1	192	48,768	N/A
Phase 2	228	57,912	18%
Phase 3	238	60,462	4%

2.7 Service Integration and Coordination

Providing the highest quality service in the SR-12 corridor would also include the potential for passengers to transfer to other local transit services, particularly Napa VINE and Fairfield Suisun Transit. To the greatest degree possible, the SR-12 transit service will be coordinated with these services.

The main difficulty of providing convenient transfers to other routes arises from the differentials between the cycle times of the SR-12 route and those of Napa VINE and FST routes. Tables C-1 and C-2 in Appendix C show the current times at which selected Napa VINE and FST routes arrive at potential transfer points.

2.8 Paratransit Impacts

Extending fixed-route transit service into areas not currently served (e.g. Rio Vista) leads to the provision of complementary paratransit service in an analogous service area, as stipulated in the Americans with Disabilities Act (ADA). The extent and operating characteristics of complementary ADA paratransit are dependent upon the operating characteristics of SR-12 fixed-route service, as well as the transit agency operating the service.

As much of the SR-12 service area is already served by the respective paratransit providers for Napa and Solano Counties, the most significant paratransit addition would consist of complementary ADA paratransit service to Rio Vista, which is not technically currently served. The City of Rio Vista would likely have to contribute additional funding to Solano Paratransit to cover complementary service if usage increased by Rio Vista residents. However, the passage of a sales tax measure would help to offset those costs. Additionally, if the decision was made to go forward with commuter bus service provided only at peak hours, then complementary ADA paratransit would not be required.

CHAPTER THREE VEHICLE CHARACTERISTICS

3.1 Vehicle Requirements and Parameters

Vehicle requirements for new service in the SR-12 corridor must address the following issues:

- Number of vehicles
- Type of vehicles
- Vehicle Size
- Fuel Type
- Interior Configuration
- Operating Capabilities (range and power)

Given the operational characteristics of the new service, it is anticipated that three vehicles would be required. Due to scheduling arrangements and anticipated passenger demand, two 35- to 40-foot vehicles will be needed to operate the full three phased service, plus one spare eventually. Smaller vehicles (i.e. 18- seat cut-a-way buses) could be used to initiate the service.

As an additional part of implementing the service plan, the transit operator may not need to purchase a third vehicle because a vehicle from the existing fleet may be able to serve the occasional need for a spare. Using an existing vehicle as a spare would only prove problematic if a distinctive color scheme is devised for the new SR-12 service, which would distinguish them from existing services.

The type of vehicle and its configuration should be chosen to best meet the needs of the service's expected riders. Two types of vehicles that could be utilized for the service are over-the-road coaches, such as those operated by a number of commuter services in the area, and urban buses, like those used by Napa VINE. Although an over-the-road coach would improve the comfort of commuters traveling longer distances, it could increase dwell times at popular stops by restricting boarding and alighting to a single door, as well as limiting the functionality of the vehicle for other trip purposes. In addition to shorter dwell times, an added benefit of urban buses is the increased flexibility of the interior configuration, allowing for varying numbers of seats, space for wheelchairs, the potential for low floor vehicles, etc.

The operating capabilities of the vehicles are also dictated by the service's proposed alignment. Of particular importance is the length of the route, which is roughly 19 miles between Napa and Suisun City each way and 39 miles between Napa and Rio Vista.

3.2 Emissions Standards

A major factor limiting the choice of fuel type and vehicles for the SR-12 service is California's stringent emissions standards. Currently, there are three major regulations which impact transit vehicle selection – engine emissions standards, transit fleet standards, and fuel standards. Because it is assumed that all the potential operators of the service currently meet the relevant fleet standards, from an emissions standpoint, it is the engine standards that will have the most influence on which vehicles are viable options.

Table D-1 in Appendix D outlines California's current emissions standards for heavy-duty urban buses and Table Two in Appendix B summarizes the fleet rule for transit agencies. Excerpts from the relevant sections of the California Code of Regulations (CCR) are included in Appendix E. Although it will be discussed again in the subsequent section, it is worth noting here that no diesel-fueled engines have been certified to meet the 2005 emission standard. For the SR-12 service, this means that at this time only previous model years' diesel buses that meet the applicable emission standards can be used.

3.3 Vehicle Fuels and Technology

Taking into consideration the operational requirements for the service, the fuels and technologies that will best meet the needs for the SR-12 service are: Compressed natural Gas (CNG), or hybrid-electric (gas). The information presented here compares various characteristics of all fuel/technology combinations that were examined, which includes the three already mentioned, as well as biodiesel, fuel cells, methanol/ethanol, and natural gas. 100% electric vehicles are not included due to the lack of full-size (35' to 40') buses with the range to operate the service.

If existing vehicles are not available to initiate SR-12 the transit service, there are three possible alternatives:

- Purchase smaller clean diesel buses (either 29-foot or 18-foot cut-a-ways)
- CNG buses (if new fueling facilities could be provided or arrangements could be made to use existing fueling facilities along the corridor).
- Hybrid-electric gasoline buses (once they are certified and are available)

Table D-3 in Appendix D summarizes general characteristics of the various fuel alternatives. Note that hydrogen and fuel cells are not included due to the fact that the fuel and technology are not readily available at this time. The table includes information on the fuel source, its cost, expected emissions, and fuel availability.

Table D-4 in Appendix D summarizes basic characteristics of the vehicle technologies. The information presented includes vehicle availability, maintenance, safety, and vehicle and infrastructure costs.

3.4 SR-12 Transit Service Vehicles

Implementing the SR-12 transit service between Napa and Rio Vista is contingent upon having vehicle funding available and vehicles that are ready to be delivered (having been leased or purchased) by the operator. Most bus manufacturers have a lead time of at least six to nine months before vehicles are delivered after an order has been placed, which may limit vehicle choices once funding is available. Due to the small number of buses that will be used to operate the service, the buses may be purchased as options on another agency's vehicle purchasing contract, called "piggybacking." If this is done, the vehicle lead time will vary according to the details of individual contracts.

The capital cost estimates assumed that over-the-road buses (i.e. $500,000 ea. in 2005 dollars) would eventually be purchased, at least by Phase 3. However, in the short term, if the Phase 1 and 2 service was to be initiated over the next few years, smaller clean diesel buses (i.e. 29 foot or 18 foot cut-a-way buses) would probably be of sufficient size to meet the demand and could be purchased or leased by the existing operator in a reasonable timeframe. However, this would be a key decision to be made between STA, NCTPA and the selected transit operator once the service is proposed to start.

CHAPTER FOUR PROJECT FINANCING

Funding for the implementation of transit service on SR-12 between the various funding agencies (i.e. STA, NCTPA and the cities along the corridor) will also be further examined as part of a future implementation plan. For example, it could be incorporated into the approval of a half-cent transportation measure ballot initiative. However, under any scenario, farebox recovery, and its impact on the transit operator implementing the service, will be a part of the overall consideration of cost versus revenue as discussed below. The subsequent discussion will outline the original proposals and recommendations for financing capital, administrative and operating needs.

4.1 Fare Policy

Choosing an appropriate fare structure and policies for a particular service are vital to the successful implementation of new transit service. There are a variety of factors that influence this decision, including:

- Fare structure of implementing and neighboring transit systems,
- Intended service markets,
- Farebox recovery ratio requirements, and

- Availability of funding revenue.

Fares should be set so that they are consistent with existing services, are appropriate for the intended market, and meet whatever funding goal the service might have. The following sections discuss how these issues apply to the SR-12 transit service.

Table 4-1, below, lists some of the fare structures for current fixed-route services in the Napa and Solano counties region and lists the proposed fare structure for the SR-12 service.

Table 4-1 Current and Proposed Fare Structures

		FST Route 30 Fairfield to Sacramento	NAPA VINE Route 10 Calistoga to Vallejo	*Proposed for SR-12 service at Phase 3*
General Public Fare	**Base**	$1.75	$1.00	$2.50
	Maximum	$3.75	$2.50	$3.75
Fare for senior citizen or person with a disability	**Base (local service)**	$0.60	$0.50	$1.25
	Maximum	$1.85	$1.25	$1.75
Monthly pass, general public	**Base**	$50	$40.00	$70.00
	Maximum	$91	NA	$105.00
Monthly pass for senior citizen or person with a disability	**Base**	NA	$20.00	$35.00
	Maximum	NA	NA	$50.00
Transfer within system		Free	Free	Free
Transfer to/from another system		Transferring to FST: transfer valued at $1.25. Transferring from FST: transfer valued at base fare credit.	Free: Yountville Shuttle, American Canyon Transit, local Vallejo Transit routes. Additional $0.25 required: Benicia Transit. Transfer valued at base fare credit: BARTLink buses to BART or Solano College.	Transfer valued at base fare credit.

As illustrated by the above table, the proposed fare structure for the SR-12 service is most similar to the long-distance Route 30, operated between Fairfield and Sacramento by Fairfield Suisun Transit, which reflects its intended market of commuters and general users. A bi-level fare structure is proposed for the service in Phase 2, when service extends to Rio Vista. A base fare (for trips starting in either Rio Vista or Napa) would cover travel as far as either the Fairfield Transportation Center in the westbound direction

or the Suisun Amtrak Station in the eastbound direction. A higher fare would be charged for travel beyond these points in both directions. The base and maximum single-ride fares, as shown in Table 4-1, are proposed to be set at $2.50 and $3.75, respectively (in 2005 dollars). The single-zone fare is higher than other local services in the area, but the differential is justified by the relatively few stops (and thus, faster operating speed) of the service. The adult maximum fare is identical to the Route 30 fare between Fairfield and Sacramento, which is a trip of roughly equivalent distance to the Napa-to-Rio Vista trip.

Monthly passes are set at 70% of the cost of four weeks of Monday-through-Friday round trip travel at the regular fare. As such, the maximum monthly pass would cost $105, higher than other local monthly passes, but the SR-12 service would be one of the main alternative options available for some commuters and, therefore, are likely to form the bulk of the ridership of the new service. These riders are most likely to purchase monthly passes.

For Phase 1, service between Suisun City and Napa would not require a bi-level fare structure, and thus would adhere to the base fare levels put forth above, from $2.50 for a single adult trip, up to $70 for a monthly pass

The minimum goal for transit services in urbanized areas and receiving state funding is to cover 20% of operating costs through fares. Farebox recovery ratio requirements for the service will vary somewhat according to who operates the service. For example, if an existing transit provider operates the service and maintains a farebox recovery ratio above 20%, the SR-12 service would only need to provide as much fare revenue as is needed for the system to maintain a 20% farebox recovery ratio. On the other hand, if the service is initiated through a Joint Powers Authority or a new public entity, the service must meet the 20% standard unless a new standard for the service is established based on the portion of the service that is in urbanized areas.

Given that commuters are expected to be the primary purchasers of monthly passes and that general users would pay a one-way fare, the proposed fare structure is appropriate for the service being provided and should be considered a minimum fare structure for implementation. This recommendation is summarized in Table 4-2. The service operator should review ridership trends every six to twelve months and consider making minor modifications as needed to reach the farebox recovery goal.

Table 4-2 Recommended Fare Structure for SR-12 Service

Fare Type	User	Phase 1	Phases 2 and 3	
			Base	*Maximum*
Single Ride Fare	General public	$2.50	$2.50	3.75
	Senior or person with a disability	$1.25	$1.25	1.75
Monthly Pass	General public	$70.00	$70.00	$105.00
	Senior or person with a disability	$35.00	$35.00	$50.00
Transfer to/from another system	All	Base Fare Credit	Base Fare Credit	Base Fare Credit

For the new service to not jeopardize funding for existing transit services or a new operator, the service should strive to attain a farebox recovery ratio of 20%. The farebox recovery viability of SR-12 service is discussed in detail in Section 4.3 of this chapter.

4.2 Capital Needs

In order to implement transit service on SR-12, there are a few basic capital requirements that need to be met: vehicles and bus stops. There could be the need to construct a new fueling facility (i.e. if CNG fueled vehicles are selected) or to have an agreement with an existing CNG fuel provider (i.e. Solano Garbage Co.). Another possible infrastructure need is a maintenance and/or vehicle storage facility. Depending on which local agency arranges for the operation of the service, the maintenance and vehicle storage needs of the new service would need to be factored into that agency's current and planned infrastructure.

This section details the service's capital needs for bus stops and vehicles.

Bus Stops and Shelters

The chosen route alignment for the SR-12 service (see Figures 2-1 and 2-2) brings service to a number of locations that have been without service. Implementing the service will initially require a modest investment in bus stop signs to designate where the service stops. In addition to modifying existing bus stop signage to include SR-12 service, at least 3 new bus stop signs will need to be installed. These locations are listed in Table 4-3.

Table 4-3 Locations of New Bus Stops

Location	Implementation Phase	Number of stops
Church Road/SR 12, Rio Vista	2	2 (eastbound & westbound)
Red Top Road Park and Ride Lot	3	1
Total		**3**

While bus stop improvements are important and should be prioritized once SR-12 service is established, initial efforts should focus on starting the service and providing the necessary infrastructure to do so. It is anticipated that several capital projects will be prioritized after service implementation, including some of the following:

- Adequate parking near selected commuter stops,
- Enhanced park and ride facilities,
- Pedestrian friendly walkways from parking to stop locations,
- Bus turn outs,
- Bus shelters, and
- Electronic fare collection to facilitate inter-system transfers and revenue accounting.

The initial focus on bus stop improvements should be to provide the minimum infrastructure necessary to implement the service. Therefore, it is recommended that four bus stop signs be installed where none currently exist. The cost of bus stops served exclusively or shared by the SR-12 service should be paid for as part of the SR-12 service. For the purpose of the capital planning, bus stop sign installations are estimated to cost $750 each.

After the service is initiated, stop improvements should include the installation of shelters and benches – prioritizing the most heavily used stops and those that are used jointly by the SR-12 service and other transit agencies. Alternatively, shelters may be installed at new stop locations, using phased construction whereby the bus stop signs are installed prior to the accompanying shelter. The cost of a new shelter (including installation) is estimated at $15,000 - $20,000.

Implementing all of these capital improvement projects will require coordinated efforts between agencies (i.e. STA, NCPTA, Napa VINE and Fairfield Suisun Transit) in the planning and project development phase.

Vehicle Acquisition

The vehicle procurement plans discussed below include both the purchase and lease of vehicles. Leasing to purchase is generally an option - but transfer of ownership most commonly occurs after a five or seven year leasing period. As indicated previously, three vehicles will be purchased or leased to operate SR-12 service. All vehicles should be procured prior to the start of service to accommodate the schedule and anticipated ridership.

4.3 Financial Analysis

The following sections details the major assumptions used to develop a budget for the three implementation phases of SR-12 transit service.

Operating Costs & Revenues

The following discussion pertains to anticipated operating costs and revenues for SR-12 corridor service.

OPERATING COSTS

Service Contract

The service contract constitutes the largest portion of the service's operating costs. The cost of the service contract includes: the cost of contracted service, administration costs incurred by the service administrator, and maintenance costs. The subsequent discussion outlines how these values were estimated:

- **Cost of contracted service** is a function of the daily service hours that are operated, the average number of weekdays (excluding major holidays) in a year (254), and the contracted hourly rate. In the case of SR-12 service, annual service hours for the Phase 1 are estimated at 3,133, increasing to 5,842 in Phase 2 and to 7,535 in Phase 3. The rate of $84 used for the budget is based on the most recent reported cost per hour (FY 2003-2004) for Fairfield Suisun Transit (adjusted 5% to 2005 dollars). This rate accounts for both the contractor rate and in-house operating and maintenance expenses. Before an actual service is implemented this hourly rate should be escalated accordingly, based on current or projected costs using the consumer price index. .
- **Administration** costs are assumed to be a fixed percentage of the contracted operating cost (without a split-shift premium being applied). This includes the cost to oversee the contractor's service and fulfill the various responsibilities detailed in the service administration section of this plan. The only exception is the cost of marketing, which has been separated as its own line item.

Marketing

Marketing SR-12 service prior to service initiation and then once it is in operation will be vital to the success of the service. Specific marketing activities are detailed in Chapter Four. For the purpose of budgeting, marketing efforts are concentrated at the beginning of the service to ensure that potential riders are well educated about the service. In the first year of service (Phase 1), $15,000 is allocated for marketing, $10,000 for Phase 2, and $5,000 Phase 3.

OPERATING REVENUES

Fare Revenue

The average fare on the proposed service is projected at $1.75 for Phases 1 and $2.00 for Phases 2 and 3. The average fares are based on the assumption that most riders will utilize the $70 and $105 monthly passes, and that approximately 71% of the passengers will pay a single-zone fare when the bi-level fare structure is introduced.[3]

Based on 2005 base year ridership demand numbers of 117 in a month with 254 weekdays, if SR-12 service commenced immediately it would yield a monthly farebox return of $4,333 in Phase 1. Over the course of a calendar year, the service under projected ridership conditions would take in $52,006 in the first phase. Based on Fairfield/Suisun Transit's existing (2005) average cost per hour for operations and administration of about $84.00, Phase 1 service would operate with a 19.7% farebox recovery ratio. A farebox recovery ratio of 14.3% could be expected in Phase 2. Based on these current base year numbers, if SR-12 service starts too soon it could run the risk of falling short of the 20% California TDA standard, until such time as increases in ridership (as a result of planned growth along the corridor) would occur. Extrapolating from the average fare, with daily ridership of 192 in a month (by 2030) with 254 weekdays, SR-12 service would yield a monthly farebox return of $7,112 in Phase 1. Over the course of a calendar year, the service under projected ridership conditions would take in $85,344 in the first phase. Based on Fairfield/Suisun Transit's existing (2005) average cost per hour for operations and administration of about $84.00, Phase 1 service would operate with a 32.4 % farebox recovery ratio. A farebox recovery ratio of 23.6% could be expected in Phase 2, dropping to 19.1% in Phase 3. In Phase 3, this SR-12 service could run the risk of falling short of the 20% TDA standard, Estimated fare revenues and the corresponding farebox recovery ratio are presented in Table 4-4-1 and 4-4-2 shown below.

Table 4-4-1 Estimated 2005 Fare Revenues and Farebox Recovery Ratios

	Phase 1	Phase 2	Phase 3
Annual Fare Revenue	$52,006	$70,612	$74,676
Farebox Recovery Ratio	19.7%	14.3%	11.8%

Based on 2005 $'s

[3] The single-zone fare percentage is derived from the likely fare paid by monthly pass commuters traveling between the origin-destination pairs utilized to develop the ridership projections in Chapter One.

Table 4-4-2 Estimated 2030 Fare Revenues and Farebox Recovery Ratios

	Phase 1	Phase 2	Phase 3
Annual Fare Revenue	$85,344	$115,824	$120,904
Farebox Recovery Ratio	32.4%	23.6%	19.1%

Based on 2005 $'s

Capital Costs & Revenues

The following discussion pertains to anticipated capital costs and revenues for SR-12 service.

CAPITAL COSTS

Vehicle Procurement

Capital costs for the SR-12 service are dominated by the cost to purchase or lease three heavy-duty buses. Although vehicle procurement recommendations have not yet been completed, an average purchase price of $500,000 is currently assumed in the budget to eventually purchase over-the-road buses when they are certified and available for purchase.

Bus Stops & Shelters

As discussed in Section 2 of this chapter, there will be initial costs associated with installing bus stops (and possibly shelters) where none currently exist, and future costs to improve the quality of all bus stops and shelters along the alignment of the SR-12 transit service. For those stops used exclusively by the new SR-12 service, the budget assumes that all capital costs are paid for by the service. The capital cost of making improvements to shared stops is assumed to be split equally between the service and the other agency(ies) serving the stop. The cost to install bus stops signs is assumed to be $750 and for shelters with benches and concrete pads, the cost is $15,000 - $20,000 each.

Fueling Facility

At this time, it is assumed that no additional fueling facilities will be needed to initiate the SR-12 service.

Maintenance Facility

At this time, it is assumed that no additional maintenance facilities will be needed to operate the service.

CAPITAL REVENUES

Sales Tax Measure

It is expected that much of the capital funding would be provided by a transportation sales tax measure likely to appear on the June 2006 ballots in both Solano and Napa

counties. The sales tax measure would provide funding for roadway improvements along SR-12, particularly in Jameson Canyon, as well as much of the startup costs for SR-12 transit service. However, if the service were initiated using vehicles from the existing fleet of Napa VINE or Fairfield/Suisun Transit, the capital costs would be minimal, beyond the costs of installing bus stop signage.

Other Potential Funding Sources

In addition to the sales tax measures, funding may be available from the TDA sources of Napa and Solano counties as well as grant money from the Yolo-Solano and/or Bay Area Air Quality Management District's Transportation Fund for Clean Air or Federal Congestion Management & Air Quality sources.

Cost Projections

Preliminary cost projections for the three phases of SR-12 service implementation are presented in Table 4-5. It is worth noting that if arrangements can be made to begin the service using buses from the existing fleet of either VINE or FST, then the Phase 1 expenses would decrease steeply.

Table 4-5 SR-12 Transit Service Budget by Implementation Phases

	Phase 1	Phase 2	Phase 3
Capital			
Buses	$1,500,000	$500,000	$500,000
Bus stops	$ 1,500	$ 750	$ 1,500
Bus shelters	$ -	$ 60,000	$ -
Capital Total:	***$1,501,500***	***$560,750***	***$501,500***
Operating			
Annual Operating Costs	$263,172	$490,728	$632,940
Marketing	$ 15,000	$ 10,000	$ 5,000
Operations Total:	***$278,172***	***$500,728***	***$637,940***
Total Expenses	***$1,779,672***	***$1,061,478***	***$1,139,440***

SOURCE: ESTIMATES ARE BASED ON 2005 $'S

CHAPTER FIVE MARKETING AND PUBLIC INFORMATION CONCEPTS

To ensure success for the SR-12 transit service, it must be properly marketed throughout the communities it serves. Marketing and public information includes the dissemination of information on routes and schedules, as well as general promotion of the service. This program will require a high degree of coordination between Napa VINE, Fairfield Suisun Transit, Rio Vista Transit, Solano Transportation Authority (STA), Napa County Transportation Planning Agency (NCTPA), Solano Napa Commuter Information (SNCI) and the Metropolitan Transportation Commission. The marketing activities discussed in this chapter should be initiated prior to the implementation of SR-12 service and sustained once service is in operation. New transit services are often plagued by low initial ridership largely due to the fact that people are not aware of the new service. In fact, new transit routes often require between twelve and eighteen months to establish themselves as average performing routes.

It is always beneficial to utilize as many venues as possible to publicize the new transit service. Options include utilizing public service announcements (PSAs) on local radio stations, including Spanish-speaking stations, as a good opportunity to reach potential bus riders. Working with large employers in the corridor to promote the service to their employees will also help to build awareness.

Before the service can be effectively marketed, the service plan needs to be finalized so that routing and scheduling information can be advertised. It will also be helpful if the following items have been established prior to marketing the service:

- Service identity;
- A logo and letterhead;
- A website with information on the service;
- Information about the new service on the SNCI travel advisory hotline (800) 53-KMUTE, the 511 travel information hotline and 511.org;
- A brochure explaining the service (maps and timetables) – it is equally important to ensure wide distribution and access to these brochures, and;
- The provision of monthly passes that can be sold and are readily available at locations throughout the community, including: government offices, major retail outlets and transit hubs, and major medical facilities. These locations should be identified and contacted as soon as possible in order to initiate discussions that would allow for the sale of monthly passes.

It is important to generate media attention and market the services prior to implementation. Media coverage is often the best form of promotion for a transit system because it generally can reach a larger audience than direct marketing and does not cost

anything. Before implementing the new service, press releases should be sent to local newspapers, television and radio stations to generate media interest in covering new service. All marketing materials should include the phone number, logo, and website address for the service. It will be important to maintain contact with local media sources, so that when other events arise (such as route or fare changes), there will be an existing relationship that should make it easier to get media coverage.

Special events and community meetings can also be an effective means of engaging the general public regarding SR-12 service. These types of events and presentations provide an opportunity to interact with members of the community, answer questions regarding the new service and to generally promote the service. During the service's first week of operation, it would be appropriate to organize a 'ribbon-cutting' ceremony to officially introduce the new service to the public.

As another marketing approach, several fare-free days could be offered during the first couple months of service to provide residents with the opportunity to utilize the service at no cost.

SR-12 transit service should also be promoted through a traditional advertising campaign. This should include radio, print, and television ads. Working with Napa VINE, Fairfield Suisun Transit and Rio Vista Transit, it should be possible to post information regarding the new service onboard local transit vehicles, on the vehicle exterior or on benches or shelters throughout the service area.

As suggested above, the development of a website is another important marketing tool for promoting the new transit service. A well-designed website can provide much needed flexibility to market and inform the public about the service. The website should have a Spanish version and be accessible to individuals with disabilities, in accordance with Section 508 of the Federal Rehabilitation Act of 1998. Some important functions an SR-12 transit corridor website would perform include the following:

- Provide essential information such as maps, route schedules, and timetables;
- Provide contact information;
- Solicit customer feedback;
- Provide time-sensitive information regarding the operation of the service;
- Display current marketing efforts and introduce new marketing campaigns; and
- Provide links to other local transit operators.

Branding is an important concept that should be considered in marketing the SR-12 transit service. Having a unique identity for the service would help differentiate the service from local, fixed-route service. A unique color scheme will also help passengers identify the vehicles that serve the corridor.

Strong customer service should also be a top priority for SR-12 transit. Transit operators have a huge impact on customer service, as customers have the most contact the most contact with them. Strong customer service should be an important criterion in the selection of a private transit operator.

A final component of the marketing program should be to provide for an evaluation of the marketing program. This evaluation would analyze the goals, objectives, and performance of the marketing activities used to promote the service. A written onboard survey is one method that could be used to evaluate the needs of customers, as well as to understand how well marketing initiatives are working with current customers. Furthermore, in order to understand and evaluate the perceptions of the broader community and the knowledge of non-users regarding the new SR-12 transit service, a more broad-based survey (conducted via the telephone) is often effective. Other survey methods include internet surveys, mail-back surveys, and intercept surveys however, they tend to be less representative of the general population. Finally, ridership surveys should be conducted regularly to understand the effectiveness of various marketing efforts to fine-tune the provision of the SR-12 transit service. During the pilot-phase of the service, it is appropriate to conduct one survey after 6 months to track initial performance and a second after 18 months, when the service is well established.

CHAPTER SIX IMPLEMENTATION PLAN AND NEXT STEPS

Once the SR 12 Transit Corridor study is approved by both the STA and NCTPA Boards, it is recommended that the staffs from the two agencies meet to discuss follow-up actions to implement the proposed three phased service plan. Specific tasks that should be addressed include:

- Direct subscription bus service between the Fairfield-Suisun City area and the Queen of the Valley Hospital and privately operated vanpools to be formed with the assistance of Solano Napa Commuter Information program should be further explored and/or implemented in the short term (i.e. during 2006 and 2007) before any commitments are made to implement express/intercity bus service along the corridor.
- Development of a Memorandum of Understanding (MOU) between STA, NCTPA (the Vine) and Fairfield-Suisun Transit to identify roles and responsibilities, budget, funding agreement. Specific issues to be addressed would be to determine which agency would purchase or lease the new buses for each of the three phases of service, confirm how much capital operating subsidy would be required; confirm what precise stops would be provided for each phase (for both peak and off-peak routes); and decide on what provisions would ensure that an adequate farebox (i.e. 20% or greater) would be achieved.

- Development of a multi-year intercity MOU funding agreement between the STA, City of Rio Vista, City of Suisun City, City of Fairfield (Fairfield – Suisun Transit) and County of Solano prior to implementation of the Phase 2 service connecting Rio Vista and Fairfield - Suisun City. Specific funding commitments from each agency, commitments on providing the necessary capital improvements in each city, bus stops/shelters and connecting bus service arrangements are to be addressed in the agreement.
- Funding sources for capital improvements along the corridor, to improve bus stops, shelters and provide new or expanded park and ride facilities, should be pursued for each phase of service.

- On-board surveys of riders on existing connecting services and adjoining routes and/or a telephone survey of likely riders residing or employed along the corridor should be conducted during 2006 or 2007 by STA and NCTPA to confirm precise stops and destinations, proposed fares and schedule before any service is initiated.
- In 2006, the SR 12 Steering Committee should meet again to consider a more detailed/refined implementation plan and schedule for implementing the new service.
- The STA, NCTPA, member agencies and/or Caltrans should enter into necessary MOU's and/or Co-operative agreements to ensure that the improvements needed to implement the necessary road and safety projects along SR 12 are implemented

on schedule. These critical projects would include but are not limited to already programmed projects such as the State Highway Operation and Protection Program for safety improvements programmed between Rio Vista and Suisun City, the easterly and central segments of North Connector in Fairfield, improvements to the SR 29/12 intersection in Napa County, the RM-2 funded I-80 HOV lane in Fairfield and the SHOPP funded Jameson Canyon Truck Climbing Lane. These improvements should be substantially in place before the any phase of the SR 12 Transit Service Plan is implemented

- Each of the proposed transportation sales tax measures for Napa and Solano Counties should consider this proposed intercity/express bus service as a key component of improving mobility along the SR 12 Corridor.

APPENDIX A

NAPA, RIO VISTA AND FAIRFIELD PUBLIC MEETING COMMENTS
And
SR-12 STEERING COMMITTEE COMMENTS

Meeting at Napa County Airport, June 27, 2005 (approximately 25 attendees)

1) Service to The Queen of the Valley Hospital: Hospital has approximately 1,400 people. Some of them commute from Fairfield and the travel time takes more than three and half hours. The major shift times are from 7AM to 8AM and 4PM to 5PM. There is a need for service extension. Questions about subscription service at peak hours to the hospital were also put forth.

2) HOV Lanes: Currently being installed on Interstate 680.

3) Transit connections to Green Island Industrial Park: The Park added 350 acres and more employees who are traveling long distances need the transit connection.

4) Time savers: Buses could save time by stopping only at Costco rather than going through the Solano Community College.

5) Short layover time can increase efficiency: 5 minutes was found to be optimum by the citizens in attendance.

Meeting at Rio Vista City Hall, June 28, 2005 (approximately 15 attendees)

1) Tax burden without service to Rio Vista should be avoided.

2) Express bus service to connect the communities within Solano County would be useful.

3) Connection to Hillcrest where a bus route connects to the Pittsburgh/Bay Point BART station is important in the longer term.

Meeting at Solano Community College, August 29, 2005 (approximately 6 attendees)

1) Questions raised as to how soon service could be expected to start.

2) Concern raised about the stop on Rio Vista's Church Road since that location is currently unsafe for a bus stop.

3) Desire to connect senior community in Rio Vista with health care facilities such as Kaiser Hospital in Fairfield.

4) Question asked as to where is the funding going to come from and how the costs will be split between Napa and Solano counties.

6) Question asked about what is driving the demand for service and whether it was coming from private retail businesses or citizens.

7) Question asked about whether Napa is getting more service because the demand is greater in terms of more concentrations of businesses and higher population.

State Route 12 Steering Committee Meeting, October 31, 2005 (approximately 25 attendees)

1) Some of the low projected numbers were questioned including farebox recovery and ridership forecasts.

2) It was suggested that a subscription service should initially be provided instead of a full transit service given the high ridership cost anticipated by the study.

3) The consultants clarified that the numbers provided are conservative and clarified that they do not have park and ride facilities factored in.

4) Other committee members stated there was glad to see the numbers more realistic versus pie-in-the-sky numbers and that although this is a case where the numbers may not look good but that a service is needed and needs to be started somewhere.

5) The Rio Vista transit route segment was discussed and it was mentioned that SR 12 transit service would attract additional riders if it stopped at the Suisun City Capitol Corridor Train Station.

6) Potential changes to the existing Rio Vista's transit service to connect to out of city routes including possibly a connection to BART connection in Antioch was mentioned.

7) The point that farebox recovery is projected to be fairly low and that it might be better to raise the fares since the transit service is still cheaper than gas or a taxi ride.

8) STA staff stated that the study is telling the committee to proceed with caution and attempts to provide options for the best way to proceed.

9) The cost of the proposed transit vehicles was discussed. And it was suggested that they cost might be too high and should be re-evaluated.

10) The idea of script service and working with major employers to provide subsidies for transit service mainly focusing on service to their employees was suggested.

11) The next steps for the study were discussed including bringing it to the Solano Transportation Authority (STA) Board and Napa County Transportation Planning Agency (NCTPA) Board for adoption. Then the actual the implementation of the study is the following step and it should be brought back later to the transit operators to and work out the details.

12) The value of public and private partnerships for this type of service was mentioned

13) Land-use planning needs to be part of the implementation of the study and there should be a land use commitment as part of any transit investment.

14) It was suggested there should be an education process implemented to point out that its okay to transfer at once on a given transit route. This option should be marketed in a way to show that transit service, even with a transfer, is still a better option than riding in your car.

The SR 12 Steering Committee then unanimously agreed to forward a recommendation to the STA Board and NCTPA Board to approve the Draft Final SR 12 Transit Corridor Plan, with these comments forwarded to each respective board.

APPENDIX B
SAMPLE SCHEDULES FOR PHASES 1, 2 AND 3

PHASE 1

Table B-1 Phase 1 Sample AM Peak Period Schedule

Eastbound	**1**	**2**	**1**
Napa VINE Transportation Center	5:50 AM	6:40 AM	7:40 AM
Napa Valley College	5:59 AM	6:49 AM	7:49 AM
Napa State Hospital	6:04 AM	6:54 AM	7:54 AM
Napa Corporate Park	6:09 AM	6:59 AM	7:59 AM
Napa Airport Industrial Park	6:11 AM	7:01 AM	8:01 AM
Fairfield Transportation Center	6:32 AM	7:22 AM	8:22 AM
Solano County Government Center & Courts	6:36 AM	7:26 AM	8:26 AM
Suisun Amtrak Station	6:40 AM	7:30 AM	8:30 AM
Westbound	**2**	**1**	**2**
Suisun Amtrak Station	5:45 AM	6:45 AM	7:35 AM
Solano County Government Center & Courts	5:49 AM	6:49 AM	7:49 AM
Fairfield Transportation Center	5:53 AM	6:53 AM	7:43 AM
Napa Airport Industrial Park	6:14 AM	7:14 AM	8:04 AM
Napa Corporate Park	6:16 AM	7:16 AM	8:06 AM
Napa Valley College	6:21 AM	7:21 AM	8:11 AM
Napa State Hospital	6:26 AM	7:26 AM	8:16 AM
Napa VINE Transportation Center	6:35 AM	7:35 AM	8:25 AM

Table B-2 Phase 1 Sample Off-Peak Period Schedule

Eastbound	**1**	**2**
Napa VINE Transportation Center	10:40 AM	1:00 PM
South Napa Marketplace Shopping Center	10:45 AM	1:05 PM
Napa Valley College	10:51 AM	1:11 PM
Napa State Hospital	10:56 AM	1:16 PM
Napa Airport Industrial Park	11:01 AM	1:21 PM
Napa Corporate Park	11:03 AM	1:23 PM
Solano Community College	11:19 AM	1:39 PM
Fairfield Transportation Center	11:25 AM	1:45 PM
Jelly Belly Candy Factory	11:28 AM	1:48 PM
Solano County Health and Social Services	11:31 AM	1:51 PM
Suisun Amtrak Station	11:35 AM	1:55 PM
Westbound	**1**	**2**
Suisun Amtrak Station	11:45 AM	2:05 PM
Jelly Belly Candy Factory	11:53 AM	2:13 PM
Solano County Health and Social Services	11:59 AM	2:19 PM
Fairfield Transportation Center	12:10 PM	2:29 PM
Solano Community College	12:13 PM	2:31 PM
Napa Corporate Park	12:15 PM	2:35 PM
Napa Airport Industrial Park	12:22 PM	2:37 PM
Napa Valley College	12:22 PM	2:42 PM
Napa State Hospital	12:27 PM	2:47 PM
South Napa Marketplace Shopping Center	12:34 PM	2:54 PM
Napa VINE Transportation Center	12:40 PM	3:00 PM

Table B-3 Phase 1 Sample PM Peak Period Schedule – Eastbound

Stop Location	1	2	1
Napa VINE Transportation Center	4:10 PM	5:10 PM	6:00 PM
Napa Valley College	4:19 PM	5:19 PM	6:09 PM
Napa State Hospital	4:24 PM	5:24 PM	6:14 PM
Napa Corporate Park	4:29 PM	5:29 PM	6:19 PM
Napa Airport Industrial Park	4:31 PM	5:31 PM	6:21 PM
Fairfield Transportation Center	4:52 PM	5:52 PM	6:42 PM
Solano County Government Center & Courts	4:56 PM	5:56 PM	6:46 PM
Suisun Amtrak Station	5:00 PM	6:00 PM	6:50 PM

Table B-4 Phase 1 Sample PM Peak Period Schedule – Westbound

Stop Location	2	1	2
Suisun Amtrak Station	4:15 PM	5:05 PM	6:05 PM
Solano County Government Center & Courts	4:19 PM	5:09 PM	6:09 PM
Fairfield Transportation Center	4:23 PM	5:13 PM	6:13 PM
Napa Airport Industrial Park	4:44 PM	5:34 PM	6:34 PM
Napa Corporate Park	4:46 PM	5:36 PM	6:36 PM
Napa Valley College	4:51 PM	5:41 PM	6:41 PM
Napa State Hospital	4:56 PM	5:46 PM	6:46 PM
Napa VINE Transportation Center	5:05 PM	5:55 PM	6:55 PM

PHASE 2

Table B-5 Phase 2 Sample AM Peak Period Schedule – Eastbound

Stop Location	1	2	1	2
Napa VINE Transportation Center	5:15 AM	6:40 AM	7:55 AM	9:20 AM
Napa Valley College	5:24 AM	6:49 AM	8:04 AM	9:29 AM
Napa State Hospital	5:29 AM	6:54 AM	8:09 AM	9:34 AM
Napa Corporate Park	5:34 AM	6:59 AM	8:14 AM	9:39 AM
Napa Airport Industrial Park	5:36 AM	7:01 AM	8:16 AM	9:41 AM
Red Top Road Park and Ride Lot	5:46 AM	7:11 AM	8:26 AM	9:51 AM
Fairfield Transportation Center	5:57 AM	7:22 AM	8:37 AM	10:02 AM
Suisun Amtrak Station	6:05 AM	7:30 AM	8:45 AM	10:10 AM
Church Road, Rio Vista	6:30 AM	7:55 AM	9:10 AM	10:35 AM

Table B-6 Phase 2 Sample AM Peak Period Schedule – Westbound

Stop Location	2	1	2	1
Church Road, Rio Vista	5:20 AM	6:35 AM	8:00 AM	9:15 AM
Suisun Amtrak Station	5:45 AM	7:00 AM	8:25 AM	9:40 AM
Fairfield Transportation Center	5:53 AM	7:08 AM	8:33 AM	9:48 AM
Red Top Road Park and Ride Lot	6:04 AM	7:19 AM	8:44 AM	9:59 AM
Napa Airport Industrial Park	6:14 AM	7:29 AM	8:54 AM	10:09 AM
Napa Corporate Park	6:16 AM	7:31 AM	8:56 AM	10:11 AM
Napa Valley College	6:21 AM	7:36 AM	9:01 AM	10:16 AM
Napa State Hospital	6:26 AM	7:41 AM	9:06 AM	10:21 AM
Napa VINE Transportation Center	6:35 AM	7:50 AM	9:15 AM	10:30 AM

Table B-7 Phase 2 Sample Off-Peak Period Schedule – Eastbound

Stop Location	1	2	1	2
Napa VINE Transportation Center	10:40 AM	11:55 AM	1:00 PM	2:15 PM
Napa Valley College	10:45 AM	12:00 PM	1:05 PM	2:20 PM
Napa State Hospital	10:51 AM	12:06 PM	1:11 PM	2:26 PM
Napa Corporate Park	10:56 AM	12:11 PM	1:16 PM	2:31 PM
Napa Airport Industrial Park	11:01 AM	12:16 PM	1:21 PM	2:36 PM
Red Top Road Park and Ride Lot	11:03 AM	12:18 PM	1:23 PM	2:38 PM
Fairfield Transportation Center	11:19 AM	12:34 PM	1:39 PM	2:54 PM
Suisun Amtrak Station	11:25 AM	12:40 PM	1:45 PM	3:00 PM

Table B-8 Phase 2 Sample Off-Peak Period Schedule – Westbound

Stop Location	2	1	2	1
Suisun Amtrak Station	10:50 AM	11:45 AM	1:10 PM	2:05 PM
Fairfield Transportation Center	10:58 AM	11:53 AM	1:18 PM	2:13 PM
Red Top Road Park and Ride Lot	11:04 AM	11:59 AM	1:24 PM	2:19 PM
Napa Airport Industrial Park	11:20 AM	12:15 PM	1:40 PM	2:35 PM
Napa Corporate Park	11:22 AM	12:17 PM	1:42 PM	2:37 PM
Napa Valley College	11:27 AM	12:22 PM	1:47 PM	2:42 PM
Napa State Hospital	11:32 AM	12:27 PM	1:52 PM	2:47 PM
Napa VINE Transportation Center	11:39 AM	12:34 PM	1:59 PM	2:54 PM

Table B-9 Phase 2 Sample PM Peak Period Schedule – Eastbound

Stop Location	1	3	2	1
Napa VINE Transportation Center	3:07 PM	4:00 PM	5:00 PM	6:00 PM
Napa Valley College	3:16 PM	4:09 PM	5:09 PM	6:09 PM
Napa State Hospital	3:21 PM	4:14 PM	5:14 PM	6:14 PM
Napa Corporate Park	3:26 PM	4:19 PM	5:19 PM	6:19 PM
Napa Airport Industrial Park	3:28 PM	4:21 PM	5:21 PM	6:21 PM
Red Top Road Park and Ride Lot	3:38 PM	4:31 PM	5:31 PM	6:31 PM
Fairfield Transportation Center	3:47 PM	4:42 PM	5:42 PM	6:42 PM
Suisun Amtrak Station	3:55 PM	4:50 PM	5:50 PM	6:50 PM
Church Road, Rio Vista	4:20 PM	5:15 PM	6:15 PM	7:15 PM

Table B-10 Phase 2 Sample PM Peak Period Schedule – Westbound

Stop Location	2	1	3	2
Church Road, Rio Vista	3:40 PM	4:30 PM	5:20 PM	6:20 PM
Suisun Amtrak Station	4:05 PM	4:55 PM	5:45 PM	6:45 PM
Fairfield Transportation Center	4:13 PM	5:03 PM	5:53 PM	6:53 PM
Red Top Road Park and Ride Lot	4:24 PM	5:14 PM	6:04 PM	7:04 PM
Napa Airport Industrial Park	4:34 PM	5:24 PM	6:14 PM	7:14 PM
Napa Corporate Park	4:36 PM	5:26 PM	6:16 PM	7:16 PM
Napa Valley College	4:41 PM	5:31 PM	6:21 PM	7:21 PM
Napa State Hospital	4:46 PM	5:36 PM	6:26 PM	7:26 PM
Napa VINE Transportation Center	4:55 PM	5:45 PM	6:35 PM	7:35 PM

PHASE 3

Table B-11 Phase 3 Sample AM Peak Period Schedule – Eastbound

Stop Location	1	2	1	2
Napa VINE Transportation Center	4:45 AM	5:55 AM	7:25 AM	8:35 AM
Napa Valley College	4:54 AM	6:04 AM	7:34 AM	8:44 AM
Napa State Hospital	4:59 AM	6:09 AM	7:39 AM	8:49 AM
Napa Corporate Park	5:04 AM	6:14 AM	7:44 AM	8:54 AM
Napa Airport Industrial Park	5:06 AM	6:16 AM	7:46 AM	8:56 AM
Red Top Road Park and Ride Lot	5:16 AM	6:26 AM	7:56 AM	9:06 AM
Fairfield Transportation Center	5:27 AM	6:37 AM	8:07 AM	9:17 AM
Suisun Amtrak Station	5:35 AM	6:45 AM	8:15 AM	9:25 AM
Church Road, Rio Vista	6:00 AM	7:10 AM	8:40 AM	9:50 AM

Table B-12 Phase 3 Sample AM Peak Period Schedule – Westbound

Stop Location	2	1	2	1
Church Road, Rio Vista	----	6:05 AM	7:15 AM	8:45 AM
Suisun Amtrak Station	----	6:30 AM	7:40 AM	9:10 AM
Fairfield Transportation Center	5:05 AM	6:38 AM	7:48 AM	9:18 AM
Red Top Road Park and Ride Lot	5:16 AM	6:49 AM	7:59 AM	9:29 AM
Napa Airport Industrial Park	5:26 AM	6:59 AM	8:09 AM	9:39 AM
Napa Corporate Park	5:28 AM	7:01 AM	8:11 AM	9:41 AM
Napa Valley College	5:33 AM	7:06 AM	8:16 AM	9:46 AM
Napa State Hospital	5:38 AM	7:11 AM	8:21 AM	9:51 AM
Napa VINE Transportation Center	5:47 AM	7:20 AM	8:30 AM	10:00 AM

Table B-13 Phase 3 Sample Off-Peak Period Schedule – Eastbound

Stop Location	1	2	1	2
Napa VINE Transportation Center	10:10 AM	11:25 AM	1:20 PM	2:35 PM
Napa Valley College	10:15 AM	11:30 AM	1:25 PM	2:40 PM
Napa State Hospital	10:21 AM	11:36 AM	1:31 PM	2:46 PM
Napa Corporate Park	10:26 AM	11:41 AM	1:36 PM	2:51 PM
Napa Airport Industrial Park	10:31 AM	11:46 AM	1:41 PM	2:56 PM
Solano Community College	10:41 AM	11:56 AM	1:51 PM	3:06 PM
Fairfield Transportation Center	10:49 AM	12:04 PM	1:59 PM	3:14 PM
Jelly Belly Candy Factory	10:51 AM	12:06 PM	2:01 PM	3:16 PM
Solano County Health and Social Services	10:53 AM	12:08 PM	2:03 PM	3:18 PM
Suisun Amtrak Station	10:55 AM	12:10 PM	2:05 PM	3:20 PM
Church Road, Rio Vista	11:05 AM	12:20 PM	2:15 PM	3:30 PM

Table B-14 Phase 3 Sample Off-Peak Period Schedule – Westbound

Stop Location	2	1	2	1
Church Road, Rio Vista	10:00 AM	11:35 AM	1:10 PM	2:45 PM
Suisun Amtrak Station	10:25 AM	12:00 PM	1:35 PM	3:10 PM
Solano County Health and Social Services	10:27 AM	12:02 PM	1:37 PM	3:12 PM
Jelly Belly Candy Factory	10:30 AM	12:05 PM	1:40 PM	3:15 PM
Fairfield Transportation Center	10:33 AM	12:08 PM	1:43 PM	3:18 PM
Solano Community College	10:45 PM	12:20 PM	1:55 PM	3:30 PM
Napa Airport Industrial Park	10:55 AM	12:30 PM	2:05 PM	3:40 PM
Napa Corporate Park	10:57 AM	12:32 PM	2:07 PM	3:42 PM
Napa Valley College	11:02 AM	12:37 PM	2:12 PM	3:47 PM
Napa State Hospital	11:07 AM	12:42 PM	2:17 PM	3:52 PM
Napa VINE Transportation Center	11:14 AM	12:49 PM	2:24 PM	3:59 PM

Table B-15 Phase 3 Sample PM Peak Period Schedule – Eastbound

Stop Location	1	2	1
Napa VINE Transportation Center	4:06 PM	5:30 PM	6:40 PM
Napa State Hospital	4:14 PM	5:38 PM	6:48 PM
Napa Corporate Park	4:19 PM	5:43 PM	6:53 PM
Napa Airport Industrial Park	4:21 PM	5:45 PM	6:55 PM
Red Top Road Park and Ride Lot	4:31 PM	5:55 PM	7:05 PM
Fairfield Transportation Center	4:42 PM	6:06 PM	7:16 PM
Solano County Government Center & Courts	4:47 PM	6:11 PM	7:21 PM
Suisun Amtrak Station	4:50 PM	6:14 PM	7:24 PM
Church Road, Rio Vista	5:15 PM	6:39 PM	7:49 PM

Table B-16 Phase 3 Sample PM Peak Period Schedule – Westbound

Stop Location	2	1	2
Church Road, Rio Vista	4:10 PM	5:20 PM	6:50 PM
Suisun Amtrak Station	4:35 PM	5:45 PM	7:15 PM
Solano County Government Center & Courts	4:38 PM	5:48 PM	7:18 PM
Fairfield Transportation Center	4:43 PM	5:53 PM	7:23 PM
Red Top Road Park and Ride Lot	4:54 PM	6:04 PM	7:34 PM
Napa Airport Industrial Park	5:04 PM	6:14 PM	7:44 PM
Napa Corporate Park	5:06 PM	6:16 PM	7:46 PM
Napa State Hospital	5:16 PM	6:26 PM	7:56 PM
Napa VINE Transportation Center	5:25 PM	6:35 PM	8:05 PM

APPENDIX C
TRANSFER TIMES TO OTHER LOCAL TRANSIT ROUTES AT MAJOR TIMEPOINTS

Table C-1: Napa VINE Route 10 Transfer Times at Major Timepoints on SR-12 Route

	Napa Valley College	Napa VINE Transportation Center
Napa VINE Route 10 - Northbound		5:20 AM
		6:00 AM
	6:41 AM	:05 every hour from 7:05 AM to 7:05 PM
	7:24 AM	
	:49 every hour from 8:49 AM to 7:49 PM	
Napa VINE Route 10 - Southbound	:05 every hour from 7:05 AM	5:20 AM
		5:40 AM
		:55 every hour from 6:55 AM to 6:55 PM
		7:35 PM

Table C-2: Fairfield Suisun Transit Routes Transfer Times at Fairfield Transportation Center

	Fairfield Transportation Center	
	AM	**PM**
FST Route 3A	:47 every hour from 7:47 AM	:47 every hour to 6:47 PM
FST Route 3B	:37 every hour from 6:37 AM	:37 every hour to 6:37 PM
FST Route 7 - Westbound	7:07 AM	12:10 PM
	7:37 AM	1:10 PM
	9:07 AM	2:10 PM
	10:07 AM	3:40 PM
	10:37 AM	4:10 PM
		5:40 PM
		6:10 PM
FST Route 7 - Eastbound	8:10 AM	2:47 PM
	8:48 AM	3:26 PM
	10:15 AM	4:56 PM
	11:15 AM	5:26 PM
	11:46 AM	6:56 PM
		7:26 PM
FST Route 30 - To/From Sacramento	6:48 AM	6:06 PM
	6:52 AM	6:12 PM
FST Route 40 - To Pleasant Hill BART	5:20 AM	3:31 PM
	6:02 AM	4:11 PM
	6:28 AM	4:51 PM
	7:36 AM	5:51 PM
		6:36 PM
FST Route 40 - From Pleasant Hill BART	6:54 AM	5:11 PM
	7:35 AM	5:56 PM
	7:56 AM	6:31 PM
	9:15 AM	7:31 PM
		8:16 PM

APPENDIX D
VEHICLE EMISSIONS STANDARDS AND FLEET REQUIREMENTS TABLES

Table D-1: Exhaust Emission Standards for Heavy-Duty Urban Bus Engines and Vehicles

Regulated Pollutant[5]	Exhaust Emissions Standards				
	2003	2004-2006[1]	2004-2006[2] Diesel-fueled urban bus engines	2004-2006[3] Diesel-fueled hybrid-electric bus engines	2007 and on[4]
HC or OMHCE	1.3 g/bhp-hr	--	--		--
NMHC	*1.2 g/bhp-hr*	--	0.05 g/bhp-hr		0.05 g/bhp-hr
CO	15.5 g/bhp-hr	15.5 g/bhp-hr	5.0 g/bhp-hr		5.0 g/bhp-hr
NOx	4.0 g/bhp-hr	--	0.5 g/bhp-hr	1.8 g/bhp-hr	0.2 g/bhp-hr
PM	0.05 g/bhp-hr	0.05 g/bhp-hr	0.01 g/bhp-hr	0.01 g/bhp-hr	0.01 g/bhp-hr
NO_x+NMHC	--	2.4 g/bhp	--		--
PM	--	--	--		--
Formaldehyde	--	--	0.01 g/bhp-hr		0.01 g/bhp-hr
Optional Standard					
NO_x+NMHC	1.8 g/bhp-hr	2.5 g/bhp-hr	--		--
PM	0.01 g/bhp-hr	--	--		--
NMHC	--	max of 0.5 g/bhp-hr	--		--

Notes:
Units of g/bhp-hr are grams per brake horsepower-hour.
Relevant sections of Title 13 CCR:

[1] 1956.1(a)(10)

[2] 1956.1(a)(11)

[3] 1956.1(a)(11)(b)

[4] 1956.1(a)(12)

[5] HC – hydrocarbons, OMHCE- organic material hydrocarbon equivalent, NMHC- non-methane hydrocarbons, CO – carbon monoxide, NOx – nitrogen oxides, PM – particulate matter.

Table D-2: Fleet Rule for Transit Agencies

Regulated Pollutant	Diesel Fuel Path	Alternative Fuel Path
	Fleet Average[1]	**Fleet Average[1]**
NOx	4.8 g/bhp-hr	4.8 g/bhp-hr
PM Standard	--	0.03 g/bhp-hr
Diesel-fueled bus standards		
NMHC	0.05 g/bhp-hr	0.05 g/bhp-hr
CO	5.0 g/bhp-hr	5.0 g/bhp-hr
NO_x	0.5 g/bhp-hr	0.5 g/bhp-hr
PM	0.01 g/bhp-hr	0.01 g/bhp-hr
Formaldehyde	0.01 g/bhp-hr	0.01 g/bhp-hr
Fuel sulfur content	15 ppm[3]	15 ppm[3]
PM diesel engine retrofit schedule		
Pre-1990 model year	to 0.10 g/bhp-hr by Jan 2003[2]	to 0.10 g/bhp-hr by Jan 2003
1991-95 model year	50% by Jan 2003	20% by Jan 2003
	100% by Jan 2004	100% by Jan 2004
1996-2002 model year	20% by Jan 2005	20% by Jan 2007
	75% by Jan 2006	75% by Jan 2008
	100% by Jan 2007	100% by Jan 2009
% of alternative-fuel buses	--	85% through MY 2016

[1] Urban buses owned, operated, or leased by the transit agency. [1956.2(e)(1), Title 13 CCR]

[2] Except for transit agencies with less than 20 vehicles in active fleet and operate in a federal one-hour ozone attainment area, then Jan 2007.

[3] By July 1 2002, except for transit agencies with less than 20 vehicles in active fleet and operate in a federal one-hour ozone attainment area, then fuel must be used by July 1, 2006.

Table D-3: Summary of Fuel Characteristics

Characteristics	Biodiesel (B100)	Low Sulfur Diesel	CNG/LNG	Liquid Petroleum Gas (Propane)	Ethanol (E85)
Cost (gge)[1]	NA	$1.65	$1.56	$1.63	NA
Source	Soybean oil, animal fats, and waste cooking oil	Imported oil	Primarily domestic natural gas	From oil refining or natural gas processing	Domestic and renewable (corn, sugar cane, etc.)
Energy security	Very high	Low	High	Moderate	Very high
Availability in service area[2]	1 station, gov't use only	Select stations	5 stations (CNG)	8 stations	0 stations
Expected emissions changes[3] - **PM** - **NOx** - **NMHC** - **CO**	 Better Worse Better Better	 Better Better Better Better	 Much better Better Possibly worse Better	 NA Better Same Much better	 NA Better NA Better

[1] In gallons or gasoline gallon equivalents (gge). *Source*: Clean Cities, "The Alternative Fuel Price Report," March 3, 2003.

[2] Includes stations within 25 miles of Fairfield, CA. *Source*: Alternative Fuels Data Center – Alternative Fuel Station Locator, http://afdcmap.nrel.gov/locator/LocatePane.asp.

[3] As compared to standard diesel fuel. *Source*: Alternative Fuels Data Center (www.afdc.doe.gov), TRB Environmental Research Needs Conference (2002), and TCRP Report 38 (1998).

Table D-4: Summary of Vehicle Technologies as Compared to Standard Diesel Fuel

Characteristics	Biodiesel (B100)	Clean Diesel	Hybrid-electric (diesel/gas)	Ethanol (E85)	Natural Gas	LPG	Fuel Cell
Vehicle availability	NA	Good [2]	Good	Poor	Very good	Good	Demonstration only
Maintenance[1]	Less	Similar	Less	Similar	More	More	Unknown
Safety concerns	Similar	Similar	Similar	More	More	More	Varies
Difference in Vehicle cost	Similar	Similar	+ ~ $200,000	NA	+ $40,000 -$60,000	Similar	Twice
Infrastructure costs	Moderate	Similar	Moderate (batteries)	High	High	Similar	Varies – source of hydrogen

[1] Refers to any increase or decrease in maintenance activities associated with the vehicles and/or refueling stations, as compared to standard diesel fuel.

[2] Because no 2005 model-year diesel engines meet the emissions requirements, the vehicles would have to be older model years.

APPENDIX E

EXCERPTS FROM CURRENT CALIFORNIA CODE OF REGULATIONS (CCR)

Division 3. Air Resources Board

Chapter 1. Motor Vehicle Pollution Control Devices

Article 2. Approval of Motor Vehicle Pollution Control Devices (New Vehicles)

§1956.1. Exhaust Emission Standards and Test Procedures -- 1985 and Subsequent Model Heavy Duty Urban Bus Engines and Vehicles.

(a) The exhaust emissions from new 1985 and subsequent model heavy-duty diesel cycle urban bus engines and vehicles fueled by methanol, natural gas, liquefied petroleum gas, and petroleum shall not exceed the following, by model year:

(1) 1985-1986 -- 1.3 grams per brake horsepower-hour (g/bhp-hr) total hydrocarbons (or Organic Material Hydrocarbon Equivalent [OMHCE] for methanol-fueled buses), 15.5 g/bhp-hr carbon monoxide (CO), and 5.1 g/bhp-hr oxides of nitrogen (NOx).

(2) 1987- (a manufacturer may certify to the 1988 emission standards one year early as an option) -- 1.3 g/bhp-hr total hydrocarbons (or OMHCE for methanol-fueled buses), 15.5 g/bhp-hr CO, and 5.1 g/bhp-hr NOx.

(3) 1988-1990 -- 1.3 g/bhp-hr HC (or OMHCE for methanol-fueled buses), 15.5 g/bhp-hr CO, 6.0 g/bhp-hr NOx, 0.60 g/bhp-hr particulate matter (PM), and for 1990 only, 1.2 g/bhp-hr optional non-methane hydrocarbons (NMHC).

(4) 1991-1993 -- 1.3 g/bhp-hr HC (or OMHCE for methanol-fueled buses), 1.2 g/bhp-hr optional NMHC, 15.5 g/bhp-hr CO, 5.0 g/bhp-hr NOx, and 0.10 g/bhp-hr PM. Emissions from methanol-fueled, natural-gas-fueled and liquefied-petroleum-gas-fueled urban bus engines may be included in the averaging program for petroleum-fueled engines other than urban bus engines.

(5) 1994-1995 -- 1.3 g/bhp-hr HC (or OMHCE for methanol-fueled buses), 1.2 g/bhp-hr optional NMHC, 15.5 g/bhp-hr CO, 5.0 g/bhp-hr NOx (or optional 3.5 g/bhp-hr to 0.5 g/bhp-hr NOx), and 0.07 g/bhp-hr PM. Emissions from methanol-fueled, natural-gas-fueled and liquefied-petroleum-gas-fueled urban bus engines, may be included in the averaging program for petroleum-fueled engines other than urban bus engines.

(6) 1996-2003 -- 1.3 g/bhp-hr HC or OMHCE, 1.2 g/bhp-hr optional NMHC, 15.5 g/bhp-hr CO, 4.0 g/bhp-hr NOx, and 0.05 g/bhp-hr PM (0.07 PM g/bhp-hr in-use), except as provided in paragraph (7) below.

(A) For 1996 and 1997 only, a manufacturer may apply to the Executive Officer for an exemption from the 4.0 g/bhp-hr NOx standard, not to exceed 10% of the average of the manufacturer's total urban bus sales in California for the three preceding model

years, upon providing technical justification and sales data for each exemption applied for.

(B) 1998 through 2003 model year engines may generate averaging, banking, and trading credits in accordance with the requirements for averaging, banking and trading programs set forth in "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy Duty Diesel Engines and Vehicles" incorporated by reference in subdivision (c) of this section.

(C) Manufacturers may choose to certify 1998 through 2002 model year bus engines produced before October 1, 2002, to an optional NOx emissions standard between 0.5 g/bhp-hr and 2.5 g/bhp-hr. A manufacturer may certify to any standard between the values of 2.5 g/bhp-hr and 0.5 g/bhp-hr, by 0.5 g/bhp-hr increments. Manufacturers may not use engines certified to this optional NOx standard for any averaging, banking, or trading program set forth in "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy Duty Diesel Engines and Vehicles" incorporated by reference in subdivision (c) of this section.

(7) October 1, 2002, PM standard -- For diesel-fueled, dual-fuel, and bi-fuel bus engines except for heavy-duty pilot ignition engines, the PM standard shall be 0.01 g/bhp-hr (0.01 PM g/bhp-hr in-use) for 2002 and subsequent model year engines produced beginning October 1, 2002. Manufacturers may choose to meet this standard with an aftertreatment system that reduces PM to 0.01 g/bhp-hr.

(8) October 2002-2006 optional standards -- Except for diesel-fueled, dual-fuel, and bi-fuel engines but including heavy-duty pilot ignition engines, manufacturers may choose to certify 2002-2006 model year bus engines produced beginning October 1, 2002, to an optional 1.8 g/bhp-hr to 0.3 g/bhp-hr NOx plus NMHC standard, measured as the arithmetic sum of the NOx and NMHC exhaust component certification values, without restriction on individual component certification values; provided that engines certified to this optional reduced-emission NOx plus NMHC standard may not participate in any averaging, banking, or trading program set forth in the test procedures document incorporated by reference in subdivision (c) of this section. A manufacturer may certify to any standard between the values of 1.8 g/bhp-hr to 0.3 g/bhp-hr, by 0.3 g/bhp-hr NOx + NMHC increments. Manufacturers certifying to this optional standard must also certify to a PM standard of 0.03, 0.02, or 0.01 g/bhp-hr.

(9) October 2002-2003 optional standards for diesel-fueled, dual-fuel, and bi-fuel engines except for heavy-duty pilot ignition engines -- Manufacturers may choose to certify 2002-2003 model year diesel-fueled, dual-fuel, and bi-fuel bus engines produced beginning October 1, 2002, to an optional 1.8 g/bhp-hr to 0.3 g/bhp-hr NOx plus NMHC standard, measured as the arithmetic sum of the NOx and NMHC exhaust component certification values, without restriction on individual component certification values; provided that engines certified to this optional reduced-emission NOx plus NMHC standard may not participate in any averaging, banking, or trading program set forth in the test procedures document incorporated by reference in subdivision (c) of this section.

A manufacturer may certify to any standard between the values of 1.8 g/bhp-hr to 0.3 g/bhp-hr, by 0.3 g/bhp-hr NOx + NMHC increments. Manufacturers certifying to this optional standard must also certify to a PM standard of 0.01 g/bhp-hr.

(10) 2004-2006: Except as provided in paragraph (11), below, the required standard shall be 2.4 g/bhp-hr NOx + NMHC measured as the arithmetic sum of exhaust component certification values for these pollutants, without restriction on individual component values, 15.5 g/bhp-hr CO, and 0.05 g/bhp-hr PM (0.07 g/bhp-hr PM in-use).

(A) Manufacturers may choose to certify to a 2.5 g/bhp-hr optional combined NOx + NMHC standard, provided that the NMHC exhaust component certification value shall not exceed 0.5 g/bhp-hr.

(B) Emissions averaging may be used to meet the combined NOx + NMHC standard, the optional combined NOx + NMHC standard set forth in paragraph (A), and the PM standard.

(C) The combined NOx + NMHC standard and the optional combined NOx + NMHC standard described in paragraph (A) may serve as the certification standard for the higher emitting fueling mode of an engine certified under the dual fueling mode certification process set forth in section 1956.8(a)(4), Title 13, CCR.

(11) 2004-2006 -- For diesel-fueled, or dual-fuel, and bi-fuel urban bus engines except for heavy-duty pilot ignition engines, the standards are 0.5 g/bhp-hr NOx, 0.01 g/bhp-hr PM, 0.05 g/bhp-hr NMHC, 5.0 g/bhp-hr CO, and 0.01 g/bhp-hr formaldehyde. As an option, manufacturers may choose to meet the NOx and PM standards with a base engine that is certified to the standards in paragraph (10) above, equipped with an aftertreatment system that reduces NOx to 0.5 g/bhp-hr and PM to 0.01 g/bhp-hr standards. The NMHC, CO, and formaldehyde standards in this paragraph (11) shall still apply. Manufacturers shall be responsible for full certification, durability, testing, and warranty and other requirements for the base engine. For the aftertreatment system, manufacturers shall not be subject to the certification durability requirements, or in-use recall and enforcement provisions, but are subject to warranty provisions for functionality.

(A) Engine manufacturers may sell diesel-fueled, dual-fuel, or bi-fuel engines to any transit fleet exempted by the Executive Officer under paragraphs (c)(8) and (d)(7) of section 1956.2, Title 13, CCR, from the requirements of paragraphs (c)(5) and (d)(4) of section 1956.2, certified to the standards in either paragraphs (9) or (10) above, provided that engines certified to the standards in paragraph (10) must be certified to a 0.01 g/bhp-hr PM standard.

(B) Manufacturers may sell diesel-fueled hybrid-electric buses that are certified to a 1.8 g/bhp-hr NOx and 0.01 g/bhp-hr PM standard to any transit agency that has received written authorization from the Executive Officer pursuant to paragraph (d)(9) of section 1956.2, title 13, CCR.

(12) 2007 and subsequent -- 0.2 g/bhp-hr NOx, 0.01 g/bhp-hr PM, 0.05 g/bhp-hr NMHC, 5.0 g/bhp-hr CO, and 0.01 g/bhp-hr formaldehyde.

(b) 2003-2006 -- A bi-fuel engine meeting the definition of a heavy-duty pilot ignition engine set forth in section 1956.2(b)(4) may be certified to the standards in section 1956.1(a)(8) and (a)(10), provided that the engine is certified to an optional PM standard of 0.03, 0.02, or 0.01 g/bhp-hr.

(c) The test procedures for determining compliance with standards applicable to 1985 and subsequent model heavy-duty diesel cycle urban bus engines and vehicles and the requirements for participation in the averaging, banking and trading programs, are set forth in the "California Exhaust Emission Standards and Test Procedures for 1985 through 2003 Model Heavy-Duty Diesel Engines and Vehicles," adopted April 8, 1985, as last amended December 12, 2002, the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," adopted December 12, 2002, and the "California Interim Certification Procedures for 2004 and Subsequent Model Hybrid-Electric Vehicles, in the Urban Bus and Heavy-Duty Vehicle Classes," adopted October 24, 2002, which are incorporated by reference herein.

Authority cited: Sections 39600, 39601, 43013, 43018, 43100, 43101, 43104 and 43806, Health and Safety Code; and Section 28114, Vehicle Code. Reference: Sections 39002, 39003, 39017, 39033, 39500, 39650, 39657, 39667, 39701, 40000, 43000, 43000.5, 43009, 43013, 43018, 43102 and 43806, Health and Safety Code; and Section 28114, Vehicle Code.

§1956.2. Fleet Rule for Transit Agencies.

(a) To encourage transit agencies that operate urban bus fleets to purchase or lease lower emission alternative-fuel buses, while also providing flexibility to such fleet operators to determine their optimal fleet mix in consideration of such factors as air quality benefits, service availability, cost, efficiency, safety, and convenience, two paths to compliance with this fleet rule are available: the alternative-fuel path and the diesel path.

(1) Transit agencies must choose their compliance path, and shall notify ARB of their intent to follow either the diesel or the alternative-fuel path, by January 31, 2001. Reporting requirements for that notification are set forth in subdivisions (a) and (b) of section 1956.4, title 13, CCR.

(2) A transit agency within the jurisdiction of the South Coast Air Quality Management District may elect to change its compliance path from the diesel path to the alternative-fuel path, provided that the transit agency notifies the Executive Officer of the change by January 31, 2004, and provided that the transit agency is in compliance with all requirements of section 1956.2, including specific requirements of the diesel path, on

or before January 1, 2004. Reporting requirements for this notification are set forth in paragraph (b)(3) of section 1956.4, title 13, CCR.

(b) For purposes of the fleet rule specified in this section, the following definitions apply:

(1) "Alternative fuel" means natural gas, propane, ethanol, methanol, gasoline (when used in hybrid electric buses only), hydrogen, electricity, fuel cells, or advanced technologies that do not rely on diesel fuel. Alternative fuel also means any of these fuels used in combination with each other or in combination with other non-diesel fuels.

(2) "Active fleet" means the total number of urban buses operated by a transit agency or under contract to a transit agency, including spare buses, but not emergency contingency vehicles or non-revenue producing vehicles.

(3) "Emergency contingency vehicle" means an urban bus placed in an inactive contingency fleet for energy or other local emergencies, after the urban bus has reached the end of its normal minimum useful life.

(4) "Heavy-duty pilot ignition engine" means an engine designed to operate using an alternative fuel, except that diesel fuel is used for pilot ignition at an average ratio of no more than 1 part diesel fuel to 10 parts total fuel on an energy equivalent basis. An engine that can operate or idle solely on diesel fuel at any time does not meet this definition.

(5) "Hybrid-electric bus" means an urban bus equipped with at least two sources of energy on board; this energy is converted to motive power using electric drive motors and an auxiliary power unit, which converts consumable fuel energy into mechanical or electrical energy. The electric drive motors must be used partially or fully to drive the vehicle's wheels.

(6) "Spare bus" means an urban bus that is used to accommodate routine maintenance and repair operations, and to replace a bus in scheduled service that breaks down or is involved in an accident.

(7) "Transit agency" means a public entity responsible for administering and managing transit services. Public transit agencies can directly operate transit service or contract out for all or part of the total transit service provided.

(8) "Urban bus" means a passenger-carrying vehicle powered by a heavy heavy-duty diesel engine, or of a type normally powered by a heavy heavy-duty diesel engine, with a load capacity of fifteen (15) or more passengers and intended primarily for intra-city operation, i.e., within the confines of a city or greater metropolitan area. Urban bus operation is characterized by short rides and frequent stops. To facilitate this type of operation, more than one set of quick-operating entrance and exit doors would normally be installed. Since fares are usually paid in cash or token, rather than purchased in

advance in the form of tickets, urban buses would normally have equipment installed for the collection of fares. Urban buses are also typically characterized by the absence of equipment and facilities for long distance travel, e.g., restrooms, large luggage compartments, and facilities for stowing carry-on luggage.

(c) Transit agencies on the alternative-fuel path shall meet the following requirements:

(1) Upon approval of the regulation, and through Model Year 2015, at least 85 percent of all urban buses purchased or leased each year must be alternative-fuel buses or buses with engines purchased under paragraph (c)(9).

(2) NOx fleet average requirements as set forth in subdivision (e), below.

(3) Beginning October 1, 2002, only engines certified to an optional PM standard of 0.03 g/bhp-hr or lower shall be purchased when making new bus purchases.

(4) Total diesel PM emission reduction requirements and use of low-sulfur or other allowed fuel as set forth in subdivision (f), below.

(5) Transit agencies on the alternative-fuel path shall not purchase any diesel-fueled, dual-fuel, or bi-fuel buses with 2004-2006 model year engines certified to emissions levels in excess of those specified in paragraph (a)(11) of section 1956.1, title 13, CCR, except as provided in paragraphs (c)(8) or (c)(9) of this section.

(6) Zero-emission bus purchase requirements beginning in model year 2010, in accordance with the requirements set forth in subdivision (c) of section 1956.3, title 13, CCR.

(7) Reporting requirements as set forth in section 1956.4, title 13, CCR.

(8) The Executive Officer may exempt transit agencies on the alternative-fuel path from the requirements of paragraph (c)(5) of section 1956.2, title 13, CCR, provided that:

(A) A transit agency applies to the Executive Officer for such exemption by June 30, 2001;

(B) A transit agency demonstrates to the Executive Officer that it will achieve NOx emissions benefits through 2015 greater than what would have been achieved through compliance with paragraph (c)(5); and

(C) The Executive Officer finds that transit agencies, after consulting with the Engine Manufacturers Association, have demonstrated, or are contractually committed to demonstrate, advanced NOx aftertreatment technology.

(9) A transit agency on the alternative-fuel path may purchase a bus operated with a heavy-duty pilot ignition engine provided the engine meets the standards set forth in subdivision (b) of section 1956.1.

(d) Transit agencies on the diesel path shall meet the following requirements:

(1) NOx fleet average requirements as set forth in subdivision (e), below.

(2) Total diesel PM emission reduction requirements and use of low-sulfur or other allowed fuel as set forth in subdivision (f), below.

(3) Zero-emission bus demonstration as required in subdivision (b) of section 1956.3, title 13, CCR.

(4) Transit agencies on the diesel path shall not purchase any diesel-fueled, dual-fuel, or bi-fuel buses with 2004-2006 model year engines certified to emissions levels in excess of those specified in paragraph (a)(11) of section 1956.1, title 13, CCR, except as provided in paragraph (d)(7) or (d)(8) of this section. Beginning July 1, 2003, a transit agency may not purchase alternative fuel buses certified to a PM emission level in excess of the optional standard of 0.03 g/bhp-hr when making new bus purchases.

(5) Zero-emission bus purchase requirements beginning in model year 2008, in accordance with the requirements set forth in subdivision (c) of section 1956.3, title 13, CCR.

(6) Reporting requirements as set forth in section 1956.4, title 13, CCR.

(7) The Executive Officer may exempt transit agencies on the diesel path from the requirements of paragraph (d)(4) of section 1956.2, title 13, CCR, provided that:

(A) A transit agency applies to the Executive Officer for such exemption by June 30, 2001;

(B) A transit agency demonstrates to the Executive Officer that it will achieve NOx emissions benefits through 2015 greater than what would have been achieved through compliance with paragraph (d)(4); and

(C) The Executive Officer finds that transit agencies, after consulting with the Engine Manufacturers Association, have demonstrated, or are contractually committed to demonstrate, advanced NOx aftertreatment technology.

(8) A transit agency on the diesel-fuel path may purchase a bus operated with a heavy-duty pilot ignition engine provided the engine meets the standards set forth in subdivision (b) of section 1956.1.

(9) The Executive Officer shall authorize, in writing, a transit agency on the diesel path to purchase one or more diesel-fueled hybrid-electric bus certified under title 13, CCR, section 1956.1(a)(11)(B) provided that:

(A) The transit agency shall submit a mitigation plan and letter requesting approval by January 31, 2005, to the Executive Officer that demonstrates that the transit agency will provide surplus emission reductions from urban buses in its fleet that will offset the NOx emission difference between the certified NOx emission standard of the hybrid-electric bus and 0.5 g/bhp-hr. The transit agency may not use NOx emission reductions that are otherwise required by any statute, regulation, or order or the emission reductions that will accrue from the retirement of an urban bus to be replaced by a hybrid-electric bus for the offset;

(B) The transit agency shall complete implementation of all mitigation measures set forth in the approved plan to offset NOx emissions prior to the receipt of the last diesel-fueled hybrid-electric bus; and

(C) The transit agency shall submit the reports required by section 1956.4(h).

(e) Beginning October 1, 2002, no transit agency shall own, operate, or lease an active fleet of urban buses with average NOx emissions in excess of 4.8 g/bhp-hr, based on the engine certification standards of the engines in the active fleet.

(1) This active fleet average requirement shall be based on urban buses owned, operated, or leased by the transit agency, including diesel buses, alternative-fuel buses, all heavy-duty zero-emission buses, electric trolley buses, and articulated buses, in each transit agency's active fleet. The Executive Officer may allow zero-emission buses that do not meet the definition of an urban bus to be included in the calculation of the fleet average standard upon written request to the ARB by January 31, 2002, and upon approval by the Executive Officer. The request shall include a description of the zero-emission buses, the zero-emission technology utilized, and the number of zero-emission buses to be used in calculating the NOx fleet average standard. Zero-emission buses not meeting the definition of an urban bus may not be used to satisfy the requirements of the Zero-emission Bus Demonstration Project set forth in subdivision (b) of section 1956.3, title 13, CCR.

(2) Transit agencies may use ARB-certified NOx retrofit systems to comply with the fleet average requirement (in addition to bus purchases, repowerings, and retirements).

(3) Transit agencies have the option of retiring all 1987 and earlier model year diesel urban buses by October 1, 2002, to comply with the fleet average standard requirement.

(f) To reduce public exposure to diesel particulate matter, each transit agency shall reduce the total diesel PM emissions of the diesel buses in its active fleets relative to

its total diesel PM emissions as of January 1, 2002, according to the schedule below, and shall operate its diesel buses on diesel fuel with a maximum sulfur content of 15 parts per million by weight. A transit agency shall calculate its diesel PM emission total by summing the PM exhaust emission values specified in section 1956.1(a) for each diesel-fueled, dual-fuel, bi-fuel (except for heavy-duty pilot ignition engines), and diesel hybrid-electric engine in its active fleet in grams per brake horsepower-hour (g/bhp-hr). For 1987 and earlier engines, the PM exhaust emission value shall be presumed to be 1.0 g/bhp-hr. Documentation of compliance with these requirements must be provided in accordance with the provisions of subdivision (d) of section 1956.4, title 13, CCR.

(1) No later than January 1, 2004:

(A) The diesel PM emission total for a transit agency on the diesel path shall be no more than 60 percent of its diesel PM emission total on January 1, 2002.

(B) The diesel PM emission total for a transit agency on the alternative fuel path shall be no more than 80 percent of its diesel PM emission total on January 1, 2002.

(2) No later than January 1, 2005:

(A) The diesel PM emission total for a transit agency on the diesel path shall be no more than 40 percent of its diesel PM emission total on January 1, 2002.

(B) The diesel PM emission total for a transit agency on the alternative fuel path shall be no more than 60 percent of its diesel PM emission total on January 1, 2002.

(3) No later than January 1, 2007:

(A) The diesel PM emission total for a transit agency on the diesel path shall be no more than 15 percent of its diesel PM emission total on January 1, 2002.

(B) The diesel PM emission total for a transit agency on the alternative fuel path shall be no more than 40 percent of its diesel PM fleet average on January 1, 2002.

(4) No later than January 1, 2009, the diesel PM emission total for a transit agency on the alternative fuel path shall be no more than 15 percent of its diesel PM emission total on January 1, 2002.

(5) A transit agency that is unable to comply with an implementation deadline specified in paragraphs (f)(1), (2), (3), or (4) because of the unavailability of technology may apply in writing to the Executive Officer for an extension to comply no later than ninety days prior to the applicable implementation deadline, for a time of up to, but not to exceed, one year. The applicant must demonstrate that the technology is unavailable; shall explain why the transit agency cannot comply by retiring older buses; and shall provide a schedule for compliance.

(6) Beginning July 1, 2002, a transit agency shall not operate its diesel buses on diesel fuel with a sulfur content in excess of 15 parts per million by weight, except that a transit agency may operate its diesel buses on a fuel that is verified by the Executive Officer as a diesel emission control strategy that reduces PM in accordance with section 2700 et seq., title 13, CCR. A transit agency with fewer than 20 buses in its active fleet, and that operates in a federal one-hour ozone attainment area, is not subject to this low-sulfur fuel requirement until July 1, 2006. In areas redesignated as one-hour ozone non-attainment areas prior to July 1, 2006, a transit agency initially exempt from the low-sulfur fuel requirement shall submit a plan to the Executive Officer within 30 days of redesignation for achieving compliance with this requirement.

(7) A transit agency that owns, operates, or leases fewer than 20 diesel-fueled, dual-fuel, bi-fuel, or diesel hybrid-electric buses in its active fleet and that operates in a federal one-hour ozone attainment area may delay implementation of the intermediate total diesel PM emission reduction requirements provided the transit agency complies with the implementation deadlines set forth in paragraphs (f)(3)(A) or (f)(4).

(8) A transit agency that installs a diesel emission control strategy to reduce diesel PM shall use a diesel emission control strategy that is verified by the Executive Officer in accordance with section 2700 et seq., title 13, CCR, or an urban bus retrofit device that has been exempted under Vehicle Code section 27156 as an engine rebuild kit and that reduces PM to 0.10 g/bhp-hr when used on an engine model 6V92TA DDEC for the model years specified for that engine.

(9) A transit agency that installs a diesel emission control strategy on an urban bus engine shall use the following percentage reductions from the engine certification standard value when calculating its total diesel PM emissions: 25 percent for a Level 1, 50 percent for a Level 2, and 85 percent for a Level 3 diesel emission control strategy.

(g) A transit agency with fewer than 20 buses in its active fleet may apply for an extension to comply with the provisions of section 1956.2 by submitting documentation of financial hardship to the Executive Officer, in writing, at least 30 days before the requirement becomes applicable for approval by the Executive Officer. Documentation of financial hardship shall include, but is not limited to, an analysis of the cost of compliance, the sources of available funds, and the shortfall between funds available and the cost of compliance. The transit agency must also specify the date and means by which compliance will be achieved in the request for a delay.

Authority cited: Sections 39600, 39601, 39667, 43013, 43018 and 43701(b), Health and Safety Code. Reference: Sections 39002, 39003, 39017, 39500, 39650, 39667, 40000, 43000, 43000.5, 43013, 43018, 43701(b), 43801 and 43806, Health and Safety Code; and Sections 233 and 28114, Vehicle Code.

§1956.3. Zero-Emission Bus Requirements.

(a) "Zero-emission bus" means an Executive Officer certified urban bus that produces zero exhaust emissions of any criteria pollutant (or precursor pollutant) under any and all possible operational modes and conditions.

(1) A hydrogen-fuel cell bus shall qualify as a zero-emission bus.

(2) An electric trolley bus with overhead twin-wire power supply shall qualify as a zero-emission bus.

(3) A battery electric bus shall qualify as a zero-emission bus.

(4) Incorporation of a fuel-fired heater shall not preclude an urban bus from being certified as a zero-emission bus, provided the fuel-fired heater cannot be operated at ambient temperatures above 40(F and the heater is demonstrated to have zero evaporative emissions under any and all possible operational modes and conditions.

(b) Zero-emission Bus Demonstration Project -- except as provided in (3) below, the owner or operator of an urban bus fleet on the diesel path in accordance with the provisions of section 1956.2, with more than 200 urban transit buses in its active fleet on January 31, 2001, shall implement a demonstration project. The owner or operator shall evaluate the operation of zero-emission buses in revenue service, and prepare and submit a report on the demonstration project to the Executive Officer for inclusion in a future review of zero-emission technology.

(1) This demonstration project shall meet all of the following specifications and requirements:

(A) utilize a minimum of three zero-emission buses,

(B) include any necessary site improvements,

(C) locate fueling infrastructure onsite,

(D) provide appropriate maintenance and storage facilities,

(E) train bus operators and maintenance personnel,

(F) place the buses in revenue service for a minimum duration of 12 calendar months,

(G) retain operation and maintenance records, and

(H) report on the demonstration program as set forth in subdivision (e) of section 1956.4, Title 13, CCR.

(2) When planning and implementing the demonstration project, the operator or owner shall meet the following milestones:

(A) no later than January 1, 2002, prepare and solicit bid proposals for materials and services necessary to implement the demonstration project, including but not limited to the zero-emission buses and the associated infrastructure

(B) no later than February 28, 2006, place at least three zero-emission buses in operation, and

(C) no later than July 31, 2005, submit a preliminary report on the demonstration project to the Executive Officer, in accordance with paragraph (e)(3) of section 1956.4, title 13, CCR and,

(D) no later than July 31, 2007, submit a report on the demonstration project to the Executive Officer, in accordance with paragraph (e)(4) of section 1956.4, Title 13, CCR.

(3) Multiple transit agencies within the same air basin may, on a case-by-case basis, petition the Executive Officer to implement a joint zero-emission bus demonstration project. Electric trolley buses shall not qualify as zero-emission buses for purposes of this joint demonstration project. No more than three transit agencies can participate in any one joint project. Transit agencies that are participating in a joint demonstration project shall:

(A) designate the agency hosting the onsite demonstration,

(B) jointly fund the demonstration project, and

(C) place a minimum of three zero-emission buses per demonstration project in revenue service.

(c) Purchase Requirement for Zero-emission Buses -- The owner or operator of a transit agency with more than 200 urban buses in active service on January 1, 2007, for transit agencies on the diesel path, and January 1, 2009, for transit agencies on the alternative-fuel path, shall purchase and/or lease zero-emission buses, in accordance with the following:

(1) For transit agencies on the diesel path, in accordance with the requirements in section 1956.2, a minimum 15 percent of purchase and lease agreements, when aggregated annually, for model year 2008 through model year 2015 urban buses shall be zero-emission buses.

(2) For transit agencies on the alternative-fuel path, in accordance with the requirements in section 1956.2, a minimum 15 percent of purchase and lease agreements,

when aggregated annually, for model year 2010 through model year 2015 urban buses shall be zero-emission buses.

(3) The provisions of paragraphs (1) and (2) shall not apply if the operator's urban bus fleet is composed of 15 percent or more zero-emission buses on January 1, 2008, for transit agencies on the diesel path, and on January 1, 2010, for transit agencies on the alternative-fuel path, or at any time thereafter.

(4)(A) Transit agencies on either the diesel path or alternative-fuel path may earn credits for use in meeting the purchase requirements for zero-emission buses specified in paragraphs (c)(1) and (c)(2) by placing zero-emission buses in service prior to the dates specified in paragraphs (c)(1) and (c)(2). For each zero-emission bus placed into early service, credits shall be accrued according to the following table. Each earned credit is equivalent to one zero-emission bus.

Credits per Year Place

Path	*2000-2003*	*2004-2005*	*2006*	*2007*	*2008*	*2009*
Diesel	3	2.5	2	1.5	--	--
Alternative fuel	3	2.5	2	1.5	1.5	1

(B) Zero-emission buses placed in service to meet the zero-emission bus demonstration projects as specified in subdivision (b) are not permitted to accrue credits towards the zero-emission bus purchase requirements.

(d) The Air Resources Board shall review zero-emission bus technology and the feasibility of implementing the requirements of subdivision (c) above no later than January 2006. Based on that assessment, the Board shall decide whether to proceed with the implementation of subdivision (c) requirements.

Authority cited: Sections 39600, 39601, 43013, 43018, 43100, 43101, 43104 and 43806, Health and Safety Code. Reference: Sections 39002, 39003, 39017, 39018, 39500, 39701, 40000, 43000, 43000.5, 43009, 43013, 43018, 43102, 43801 and 43806, Health and Safety Code; and Section 28114, Vehicle Code.

§1956.4. Reporting Requirements for all Urban Bus Transit Agencies.

(a) The following reports on new bus purchases and/or leases by transit operators on the alternative-fuel path shall be submitted as described below:

(1) The initial report shall be submitted by January 31, 2001, and shall state the transit agency's intent to follow the alternative-fuel path.

(2) Any requests for deviation from the requirement that 85 percent of buses purchased per year must be alternative-fuel buses must be submitted in writing and approved by the Executive Officer of the Air Resources Board 90 days prior to purchase. The written request must include the reason for requesting the deviation from the 85 percent annual purchase requirement and the transit agency's future planned alternative-fuel bus purchases.

(3) Each transit agency shall submit an annual report containing: the number, manufacturer, make, and model year of engines, and fuel used for each transit bus it currently owns or operates, bus purchases and/or leases beginning January 1, 2000, and annual average percentage of total bus purchases and/or leases that were alternative-fuel buses. The first report shall be submitted by January 31, 2001. Subsequent reports shall be submitted annually by January 31 through the year 2016.

(b) The following reports on new bus purchases and/or leases by transit operators on the diesel path shall be submitted as described below:

(1) The initial report shall be submitted by January 31, 2001, and shall state the transit agency's intent to follow the diesel path.

(2) Each transit agency shall submit an annual report containing the number, manufacturer, make, and model year of engines, and fuel used for each transit bus it currently owns or operates, and bus purchases and/or leases beginning January 1, 2000. The first report shall be submitted by January 31, 2001. Subsequent reports shall be submitted annually by January 31 through the year 2016.

(3) A transit agency within the jurisdiction of the South Coast Air Quality Management District that chooses to change from the diesel path to the alternative fuel path in accordance with paragraph (a)(2) of section 1956.2, title 13, CCR, must submit to the Executive Officer a letter of intent to follow the alternative fuel path no later than January 31, 2004. The letter of intent shall contain a statement certifying that the transit agency is in compliance with all provisions of the fleet rule for transit agencies on or before January 1, 2004.

(c) Each transit agency shall submit the following reports on the NOx fleet average requirement:

(1) Initial documentation shall be submitted by January 31, 2001, and contain, at a minimum, the active urban bus fleet NOx emission average, and if that number exceeds the average required in subdivision (e), section 1956.2, Title 13, CCR, a schedule of actions planned to achieve that average by October 1, 2002, including numbers and model years of bus purchases, retirements, retrofits, and/or repowerings, or shall indicate the intent of the transit agency to retire all model year 1987 and earlier buses in its active fleet by October 1, 2002.

(2) A final report shall be submitted by January 31, 2003, detailing the active urban bus fleet NOx emission average as of October 1, 2002, and actions, if any were needed, taken to achieve that standard, including numbers and model years of bus purchases, retirements, retrofits, and/or repowerings, or documenting the retirement of all model year 1987 and earlier buses.

(d) Each transit agency shall submit the following reports on the total diesel PM emission reduction requirements:

(1) An initial annual report shall be submitted by January 31, 2003, and shall contain, at a minimum, the following information:

(A) number, manufacturer, make, and model year of diesel-fueled, dual-fuel, bi-fuel (except for heavy-duty pilot ignition engines), and diesel hybrid-electric engines in urban buses in the active fleet; the PM engine certification value of each of those bus engines; the diesel PM emission total for the diesel buses in the active fleet; and the diesel PM emission total for the baseline date of January 1, 2002.

(B) For each urban bus for which a diesel emission control strategy has been applied, the device's product serial number; its Diesel Emission Control Strategy Family Name in accordance with the requirements of section 2706(g)(2), title 13, CCR; and the date of installation.

(2) Annual reports shall be submitted each year beginning January 31, 2004 and each January 31 thereafter, through 2009, and shall contain the information required in paragraphs (d)(1)(A) and (B) above plus the total percentage reduction of PM achieved from the baseline diesel PM emission total as of January 1 of each applicable year.

(e) The following reports on the zero-emission bus demonstration program shall be submitted by those transit agencies required to conduct such demonstrations, as described below:

(1) Initial documentation shall be submitted by January 31, 2003, and contain, at a minimum, the bus order and delivery schedule, fuel type, type of refueling station, any planned facility modifications, and a revenue service demonstration plan;

(2) A financial plan shall be submitted by January 31, 2003, and contain, at a minimum, projected expenditures for capital costs for purchasing and/or leasing buses, refueling stations, any facility modifications, and projected annual operating costs;

(3) A preliminary report shall be submitted by July 31, 2005 and contain, at a minimum, the following information:

(A) a brief description of the zero-emission technology utilized, identification of the bus manufacturer, and the product specifications;

(B) miles driven per bus in revenue and non-revenue service, safety incidents, and maintenance (both scheduled and unscheduled);

(C) qualitative transit personnel and passenger experience; and

(D) a financial summary of the capital costs of bus purchases and/or leases and fueling infrastructure.

(4) A final report shall be submitted by July 31, 2007, and contain, at a minimum, the following information:

(A) a brief description of the zero-emission technology utilized, identification of bus manufacturer and product specifications,

(B) miles driven per bus in revenue service, bus down time (scheduled and unscheduled), safety incidents, driver and mechanic training conducted, and maintenance (both scheduled and unscheduled),

(C) qualitative transit personnel and passenger experience, and

(D) a financial summary of capital costs of demonstration program, including bus purchases and/or leases, fueling infrastructure, any new facilities or modifications, and annual operating costs.

(f) The following reports on new zero-emission bus purchases and/or leases shall be submitted by transit agencies required to purchase zero-emission buses as described below:

(1) Initial report shall be submitted by January 1, 2007 for transit agencies on the diesel path, and by January 1, 2009, for transit agencies on the alternative-fuel path. The initial report shall contain, at a minimum, the following information:

(A) a brief description of the zero-emission technology to be utilized and a plan for the implementation of the requirement,

(B) for an exemption from the purchase requirement, documentation that 15 percent or more of the transit agency's active urban bus fleet is composed of zero-emission buses.

(2) Any requests for deviation from the requirement that 15 percent of buses purchased per year must be zero-emission buses must be submitted in writing and approved by the Executive Officer of the Air Resources Board 90 days prior to a transit agency submitting a purchase order(s) reflecting the purchase deviation. The written request shall include the reason for requesting the deviation and the transit agency's future planned zero-emission bus purchases.

(3) Transit agencies on the diesel path shall include in the annual reports required in paragraph (b)(2): zero-emission bus purchases and/or leases beginning with model year 2008 and through model year 2015, and the annual average percentage of total bus purchases and/or leases that were zero-emission buses.

(4) Transit agencies on the alternative-fuel path shall include in the annual reports required in paragraph (a)(3): zero-emission bus purchases and/or leases beginning with model year 2010 and through model year 2015, and the annual average percentage of total bus purchases and/or leases that were zero-emission buses.

(g) Transit agencies exempted from the requirements of paragraphs (c)(5) and (d)(4), section 1956.2, title 13, CCR, shall submit annual reports demonstrating that they are achieving NOx emission benefits required in paragraphs (c)(8)(B) and (d)(7)(B), section 1956.2, title 13, CCR. The first report shall be submitted by January 31, 2005. Subsequent reports shall be submitted annually by January 31 through the year 2016.

(h) A transit agency requesting approval for the purchase of diesel-fueled hybrid-electric buses pursuant to paragraph (d)(9), section 1956.2, title 13, CCR, shall:

(1) submit an application for approval that meets the requirements of paragraphs (d)(9)(A) and (d)(9)(B), section 1956.2, title 13, CCR;

(2) include in the application all of the following: the number, manufacturer, make and model year of diesel-fueled hybrid-electric buses to be purchased; the schedule for the purchase and delivery of the buses; a detailed description of all measures that will be used to offset the excess NOx emissions including identification of the specific buses to which the measures will be applied, and the schedule for implementing those measures; and

(3) submit a final report to the Executive Officer within 30 days of receipt of the last diesel-fueled hybrid-electric bus that documents the schedule of delivery of the diesel-fueled hybrid-electric buses, timing, and completion of all measures to achieve the NOx offset.

Authority cited: Sections 39600, 39601, 39659, 39667, 39701, 43018 and 41511, Health and Safety Code. Reference: Sections 39667, 39700, 39701, 41510, 41511, 43000, 43000.5, 43013, 43018, 43801 and 43806, Health and Safety Code.