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An Assessment of Bus Rapid Transit Opportunities in the San Francisco Bay Area

Mark A. Miller, Dustin White

**California PATH Working Paper
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**Investigation of Bus Transit Routes on State Routes in
the San Francisco Bay Area:
Selecting Case Study Corridors for Potential Bus
Rapid Transit Implementation**

**Mark A. Miller
Dustin White**

February 11, 2004

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ABSTRACT

This report documents a continuing assessment of bus rapid transit opportunities in the San Francisco Bay Area. In this study we are focusing on bus transit routes that partially travel on California state routes, whether arterial roadways or freeways. A primary component of this project is to consider the inter-connectivity and regional aspects of bus rapid transit systems deployment in the San Francisco Bay Area region. Considering state routes will help identify more regional opportunities for innovative types of partnerships to help address unmet public transit service needs across jurisdictional boundary lines. We initially identified nearly 200 bus transit routes in the Bay Area that travel on state routes. Next we embarked on a multi-step process to reduce the field of bus routes to a select few with a high likelihood of being upgraded to bus rapid transit systems. We looked at the length of the bus transit routes that travel on state routes, service characteristics related to schedule and route structures based on passenger demand level, external factors, bus routes that function essentially as one service, and level of passenger demand. We selected the following five bus routes for further consideration, the first four of which are already under investigation to be upgraded to bus rapid transit.

- AC Transit Routes 72-72M-72R on SR 123
- AC Transit Routes 82-82L along Telegraph Avenue/International Boulevard/14th Street corridor
- SamTrans Routes 390/391 on SR 82 (El Camino Real)
- Santa Clara VTA Route 22 on SR 82 (El Camino Real)
- San Francisco Muni's route 9X in San Bruno

Key Words: Bus rapid transit, state routes, San Francisco Bay Area

EXECUTIVE SUMMARY

This report documents a continuing assessment of bus rapid transit opportunities in the San Francisco Bay Area. In this study we are focusing on bus transit routes that partially travel on California state routes, whether arterial roadways or freeways. A primary component of this project is to consider the inter-connectivity and regional aspects of bus rapid transit systems deployment in the San Francisco Bay Area region. Considering state routes will help identify more regional opportunities for innovative types of partnerships to help address unmet public transit service needs across jurisdictional boundary lines. We initially identified 188 bus transit routes in the Bay Area that travel on state routes. Next, we performed an analysis of these routes that examined them relative to a set of BRT-related attributes that essentially served as filters that we used to subsequently select a small number of bus transit routes with a high potential for upgrading to BRT status. As part of the analysis, we looked at the length of the bus transit routes that travel on state routes, service characteristics related to schedule and route structures based on passenger demand level, external factors, bus routes that function essentially as one service, and level of passenger demand.

Consistent with our project objective of focusing on regional aspects and interconnectivity opportunities of bus rapid transit in the Bay Area, we chose to include only those bus routes that traveled a particular minimum amount on state routes. We were conservative and chose a small value — one mile — so as not to omit too many bus routes based solely on this factor, yet also remain faithful to the regional service character of this project. Of the total number of 188 bus routes under study, 162 of these routes travel along state roadways for more than one mile.

Next, we examined the demand characteristics (time and location) of the remaining 162 routes to identify those routes that do and do not support BRT operation; we also identified discontinued routes due to external factors. These characteristics were limited operating hours, such as night service or weekend service only; limited operating hours; low frequency services, such as 1-hour headways with few departures and arrivals; specialized route structures, such as a connection service. Of the 162 bus routes under examination at this stage, 105 of these routes are in revenue service and have demand characteristics supportive of BRT operation.

In the next stage, we grouped together several bus transit routes to represent one service based on similarities in route structures. In particular, AC Transit operates numerous transbay bus routes between San Francisco and various locations in the East Bay, many of which function essentially as one service. From a BRT perspective, these bus transit routes could function effectively as one service running frequently throughout the day, rather than as separate more limited individual services assuming that the trunk line would be serviced by feeder/collector routes from surrounding neighborhoods. A few bus transit routes were listed by multiple transit agencies, and thus duplicates were also removed during this step to avoid including these routes under multiple agencies. Of the 105 bus routes under examination during this stage, 78 routes represent distinct services.

In the next two stages, we explicitly considered ridership as a factor in helping to identify those bus routes with a high likelihood of being upgraded to BRT system status. The enhanced service provided by BRT implementation can potentially have the effect of attracting new riders. However, without an existing demand for transit service, a BRT system is not likely to be successful. To ensure sufficient demand for transit service exists, only bus transit routes with at least a selected minimum threshold average weekday ridership were selected and we considered ridership on currently existing BRT systems in the U.S. as a guide to selecting such a minimum threshold. Again, our intention was to choose a relatively small value so as not to omit too many bus routes based solely on this factor, yet also remain faithful to the fact that without existing demand, a BRT system is not likely to be successful. We initially selected a threshold of 1,000 passengers in terms of average weekday ridership; however, we increased this value to 7,000 passengers based on current data from existing U.S. BRT systems. At this point we were left with the following five bus routes with average weekday ridership greater than 7,000 passengers:

- AC Transit Routes 72-72M-72R on SR 123
- AC Transit Routes 82-82L along Telegraph Avenue/International Boulevard/14th Street corridor
- SamTrans Routes 390/391 on SR 82 (El Camino Real)
- Santa Clara VTA Route 22 on SR 82 (El Camino Real)
- San Francisco Muni's route 9X in San Bruno

These five bus routes are currently under study, though at different stages of development, to be upgraded to bus rapid transit on these corridors. We also note that the different approach taken in this project to identify bus route corridors on state routes with a high potential to be upgraded to BRT systems has led us to the same corridors that have already been selected by the more traditional and customary approach taken directly by transit agencies.

Since the objective of the current project is to identify transit routes that could support a BRT service, at this point in the project we recommend investigating the potential benefits that an upgrade to BRT could bring to these bus routes. At this stage in the project we are soliciting input from Caltrans to assist us in selecting a single bus route corridor from this list of five on which to perform more in-depth analysis.

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1. INTRODUCTION

This working paper presents the findings of our continuing examination of bus routes that travel at least some portion on state routes in the nine-county San Francisco Bay Area¹. Our overall objective in this project is to identify and study those bus route corridors on state routes that have a high potential for being upgraded into bus rapid transit corridors. This investigation is being performed as part of a Caltrans-sponsored research project that is assessing bus rapid transit opportunities in the Bay Area.

Within California, the deployment of bus rapid transit (BRT) is growing in popularity with transit properties and is being considered as an alternative travel mode to help make bus transit more attractive with enhanced levels of service with an ultimate goal of increasing ridership to contribute to relieving traffic congestion. Currently, there are three California transit properties that are members of Federal Transit Administration-sponsored U.S. BRT Consortium, including the Metropolitan Transportation Authority in Los Angeles County and two properties in the San Francisco Bay Area:

- Santa Clara Valley Transit Authority (VTA)
- Alameda Contra-Costa County Transit District (AC Transit)

These transit agencies and numerous others in California that are also studying whether to implement bus rapid transit in their service area use a rather traditional approach in the deployment of new transit systems:

The local and/or regional transit agency initiates a process whereby they study the feasibility of and potential impacts associated with bus rapid transit within its jurisdictional boundaries, e.g., intra-county. The means through which these investigations are conducted include Major Investment Studies as well as other types of alternatives analyses.

A primary component of this project is to expand beyond this intra-jurisdictional approach to consider more of the inter-connectivity and regional aspects of bus rapid transit systems deployment in the San Francisco Bay Area region. The focus is on state routes, whether arterial roadways or freeways. This will help identify more regional opportunities for innovative types of

¹ This Working Paper constitutes a combined deliverable for Tasks 3 and 4 for this project.

partnerships to help address unmet public transit service needs across jurisdictional boundary lines.

2. BRT-RELATED ACTIVITIES IN THE SAN FRANCISCO BAY AREA

Bus rapid transit has generally been considered as providing regional rather than local feeder services. While BART provides line-haul backbone transit service in the Bay Area, nothing precludes bus rapid transit from also serving in this role as well. In current economic times, it is unlikely that heavy and light rail will be built to expand this transit backbone service without also considering bus rapid transit as a viable alternative. The remainder of this section gives an overview of BRT-related activities in the Bay Area.

Transit Agency-Initiated BRT Enterprises

In this regard, bus rapid transit is not new to the Bay Area as there are numerous examples of ongoing BRT-related activity by individual transit agencies. Santa Clara VTA's Line 22 corridor is approximately 27 miles long along El Camino Real (State Route 82) and serves six Silicon Valley cities with a running time of over two hours. VTA plans to reduce travel times by using route modifications, infrastructure, traffic signal preference, queue jump lanes, fare prepayment, low-floor-articulated buses, and ITS technologies. A six-mile test section of the project became operational in 2002 (1). In the East Bay area of the San Francisco Bay Area, AC Transit currently has a BRT system deployed along San Pablo Boulevard (State Route 123) and is developing plans for a second BRT line in the Berkeley/Oakland/San Leandro corridor along Telegraph Avenue/International Boulevard/E. 14th St. (State Route 185) (2). The 16 mile San Pablo corridor runs through six East Bay cities and includes a variety of bus priority improvements and vehicle and station design improvements to cut running and dwell time. Interest in bus rapid transit in the Bay Area goes beyond these two U.S. BRT Consortium members. San Mateo County Transit District (SamTrans) is currently studying the potential impacts of adaptive bus signal priority systems along one of its primary bus routes, also on SR 82. The San Francisco Municipal Railway (Muni) is also considering bus rapid transit as an alternative transit mode along particular travel corridors as part of its vision for rapid transit in San Francisco (3).

Metropolitan Transportation Commission

In 2000, MTC defined a preliminary rapid bus system proposal for the Bay Area region as part of its *Blueprint for the 21st Century* that exploits attributes of the rapid bus concept, such as exclusive bus lanes, frequent service, high-quality passenger amenities, high-quality vehicles, intelligent transportation systems including signal priority and real-time passenger information, improved operating speed and reliability and information to the public, limited stops and timed transfers between systems, and Park & Ride lots. MTC's proposal extends the reach of BART by providing improved feeder buses in potential future BART corridors, connects the far flung parts of the region to the region's core employment centers using an expanded carpool lane system, and fills in gaps in the region's trunk line transit system. The concept includes a number of elements, such as buses on carpool lanes, improved bus access into and out of carpool lanes, expanded Park-and-Ride lots at convenient locations to the freeways, hubs for timed transfers, long-haul bus service in lengthy corridors, and late-night service in certain corridors. In a number of corridors, the buses also provide local circulation at the origin or destination end of the route. At certain hubs rapid buses would connect to suburban bus systems, BART, Light Rail Transit (LRT), commuter rail and ferries, depending on the location. The rapid bus system takes advantage of the regions investments in the HOV network. The total capital cost of our proposal is about \$178 million, including \$108 million for comfortable buses with high back seating, and \$70 million for Park-and-Ride costs and direct HOV access facilities. In terms of operating costs, we have estimated over a 15-year period, the rapid bus system would need about \$722 million in net operating subsidy, or approximately \$48 million per year. The system as a whole would generate about 26,600 new daily transit riders in 2020, which means the bus system would convert this number of daily trips from autos to transit. The actual number of passengers boarding the bus system would be larger, but our analysis has focused on the new rider number as a measure of the comparative effectiveness of different transit investments (4).

Bay Area rapid bus corridors include:

- Golden Gate (US 101)
- SR 4

- SR 92/84
- I-680
- I-580
- Santa Clara Valley
- Peninsula Corridor (I-280)
- I-80
- I-880

In 2002, MTC contracted with DKS to update MTC’s HOV Master Plan and, in particular, include specific consideration for the integration of express bus services with the HOV lane system to ensure that the two systems are mutually consistent and supportive. Existing express bus routes were identified and new services have been proposed where the present or future HOV system would support additional service between high demand origins and destinations. Additional HOV-related facilities also to support the express bus service recommendations also have been identified. These include direct HOV lane access ramps, park-and-ride facilities and major in-line transit stations adjacent to the HOV lanes (5)

Bay Area Advocacy Groups

The Transportation and Land Use Coalition (TALC), a regional advocacy organization in the San Francisco Bay Area developed in 2002 their own set of bus rapid transit initiatives for the Bay Area contained in a document entitled “Revolutionizing Bay Area Transit ... on a Budget” (6). In this document, TALC outlines a bus rapid transit network that “will provide the fastest, lowest-cost way to dramatically improve the speed and quality of public transit in our region.”

Three kinds of bus transit services were considered including:

Bus Rapid Transit, enhanced bus, express bus network in San Francisco, the East Bay (SR 123 – San Pablo Ave. and Telegraph/International) and South Bay (SR 82 – El Camino Real). The full report may be downloaded from the Internet at the following Web site:

http://www.transcoalition.org/reports/revt/revt_home.html

3. EXAMINATION OF BUS TRANSIT ON STATE ROUTES

Initially, we took an inventory of both the state routes and bus routes in the Bay Area. Table 1 lists all the Bay Area state routes and the county(ies) through which they traverse, indicated by check marks in the table. Figure 1 displays this graphically simply to indicate where these state routes are located geographically. There are approximately 500 bus transit routes in the San

Francisco Bay Area and of these, 188 travel a portion of their route along state routes divided among 15 of the more than two-dozen transit agencies in the nine-county Bay Area. These are listed in Table 2 and depicted in Figure 2.

Next, we performed an analysis of these 188 bus transit corridors that examined them relative to a set of BRT-related attributes that essentially served as filters that we used to subsequently select a small number of bus transit corridors with a high potential for upgrading to BRT status.

TABLE 1 All State Routes in the San Francisco Bay Area by County

SR	Sonoma	Napa	Solano	Marin	Contra Costa	San Francisco	San Mateo	Alameda	Santa Clara
1	✓			✓		✓	✓		
4					✓				
9									✓
12	✓	✓	✓						
13								✓	
17									✓
24					✓			✓	
29		✓	✓						
37	✓		✓	✓					
80			✓		✓	✓		✓	
82						✓	✓		✓
84							✓	✓	✓
85									✓
87									✓
92							✓		
101*	✓			✓		✓	✓		✓
116	✓								
121	✓	✓							
123					✓			✓	
128	✓	✓							
130									✓
131				✓					
185								✓	
237									✓
238								✓	
280						✓	✓		✓
380							✓		
580								✓	
680			✓		✓			✓	✓
780			✓						
880								✓	✓

Source: Caltrans District 4 website (<http://www.dot.ca.gov/dist4/>)

*Designated as US Highway 101 and not SR 101



FIGURE 1 State Routes in the San Francisco Bay Area

TABLE 2 Transit Agencies Operating on State Routes

Transit Agency	Number of Bus Routes Traversing State Routes
Alameda-Contra Costa County Transit (AC Transit)	56
County Connection	9
Dumbarton Express	2
Fairfield-Suisun Transit	3
Golden Gate Transit	35
San Mateo County Transit District (SamTrans)	24
San Francisco Municipal Railways (Muni)	2
Santa Clara Valley Transportation Authority (VTA)	21
Sonoma County Transit	7
Tri Delta Transit	5
Union City Transit	1
Vallejo Transit	3
VINE (Napa County)	1
WestCAT	8
WHEELS (LAVTA)	11
Total	188



FIGURE 2 Bay Area Bus Transit Routes Traveling Along State Routes

4. SELECTION OF CANDIDATE BRT CORRIDORS

Bus rapid transit systems are generally characterized by the criteria of frequent and all day service based on a substantial volume of passenger demand. Moreover, from the outset, this study has considered bus rapid transit from a regional perspective. We have examined the 188 bus routes previously discussed with respect to these criteria on the basis of whether they can sustain bus rapid transit operation and as a result of our examination have selected five bus routes in the Bay Area with a high likelihood of being upgraded to bus rapid transit systems and so warrant further study. The five selected corridors should be suitable for analysis of the impacts of BRT implementation by performing a macroscopic level benefit cost analysis to determine whether bus rapid transit would be beneficial to implement.

Beginning with the 188 bus routes with the above-mentioned objectives in mind, we applied a four-step process based on the above criteria together with the overall regional perspective taken in this study to reduce the field of potential BRT candidate corridors:

- Step 1: Length of the bus transit routes that travel on state routes; Based on the project's regional point of view, we believed that only those bus routes traveling above some minimum threshold on state routes should be considered further.
- Step 2: Service characteristics related to schedule and route structures based on passenger demand level; external factors.
- Step 3: Group bus transit routes that function essentially as one service.
- Step 4: Level of passenger demand; Based on the experience of current U.S. transit agencies investigating bus rapid transit systems, we believed that only those bus routes with a ridership level above some minimum threshold in terms of average weekday ridership should be considered further. The examination of passenger ridership is divided into two parts: a preliminary and a more in-depth examination.

A schematic diagram of this process is shown in Figure 3; each step in this process is discussed in further detail in the pages that follow. It should be noted that the selection process of bus transit routes for further more in-depth evaluation was not rigidly defined; throughout the process new information contributed to the elimination of routes deemed unsuitable for further evaluation. The process outlined below, however, serves as a good approximation of the logic that was followed in selecting suitable bus transit routes for evaluation as potential BRT systems.

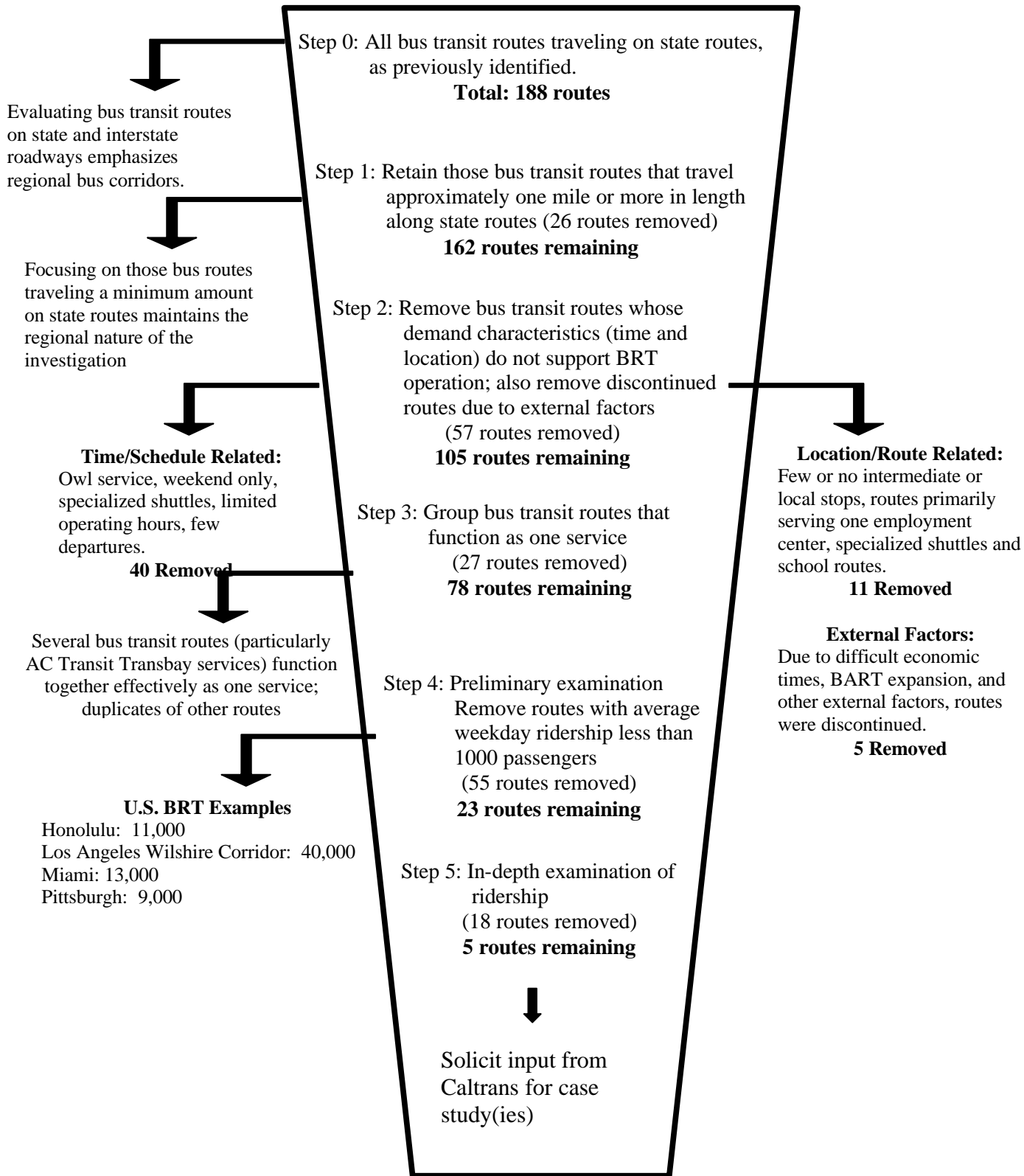


FIGURE 3 Methodology for Selecting Candidate Bus Rapid Transit Corridors

Step 1: Length of Bus Transit Routes that Travel on State Routes

As part of our assignment to focus on existing bus routes traveling on state routes, we assumed that the existing transit system and the state route network adequately serves existing population movements and so there was no need to perform a transit demand evaluation of the Bay Area.

We used information gathered from the Bay Area Transit Information website (4) and from individual Bay Area transit agencies to compile an inventory of all of the bus transit routes that travel on state routes as shown in Figure 2. The 188 of the more than 500 Bay Area bus transit routes travel along some portion of a state route. Consistent with our project objective of focusing on regional aspects and interconnectivity opportunities of bus rapid transit in the Bay Area, we initially considered whether to include each of the 188 bus routes, independent of their lengths that traveled on state routes, i.e., no matter how little on state routes. We ultimately decided to consider further those bus routes whose share on state routes was above some cut-off threshold. Our intention was to be conservative and choose a small value so as not to omit too many bus routes based solely on this factor, yet also remain faithful to the regional service character of this project. We selected a threshold of one mile. While some local bus transit routes operate a short portion of their route along state roadways, most of the bus routes traversing state roadways are more regional in nature; of the 188 bus transit routes traveling along state roadways in the Bay Area, 162 traverse these roadways for more than one mile. A complete description of the 188 bus routes and the 16 whose portion on state routes are one mile or less may be found in Appendix I.

Step 2: Demand Characteristics (Time and Location) and External Factors

A detailed examination of the remaining routes revealed characteristics that made some routes unsuitable bus rapid transit operation. These characteristics were limited operating hours, such as night service or weekend service only; limited operating hours; low frequency services, such as 1-hour headways with few departures and arrivals; specialized route structures, such as a connection service. The primary reasons for eliminating routes related to schedules and route structures; throughout the process external factors such as discontinued routes also played a role.

Forty bus transit routes were removed from further consideration based on schedule characteristics that were deemed inappropriate for BRT implementation based on current BRT system experience. A few routes such as AC Transit Route A operate owl (late night) service only, while others such as Golden Gate Transit Route 63 only run during weekends. Because of their limited service, these routes were removed from further investigation. A closer look at schedules provided by the individual transit agencies and by the Bay Area Transit Information website (7) revealed many bus routes that operate very limited peak-hour only service. For example, Golden Gate Transit Route 60 operates between San Rafael and San Francisco with only one southbound departure during the morning and one northbound departure during the evening. In contrast, most BRT systems operate with frequent service throughout the day. Several routes were eliminated based on a combination of limited service characteristics, including large headways, limited hours of operation, and a small number of departures. Many of these routes cater to commuters; although they provide an important transit service, they were not considered the best candidates for BRT implementation given their limited operational characteristics.

An additional 11 routes were eliminated based on route characteristics that would not embody a successful BRT system. These routes include specialized shuttle services such as AC Transit Route 52/52L, which operates between the University of California at Berkeley's campus and one of the University's housing centers. Also removed from further review were routes with few or no intermediate or local collector stops, which often serve one employment center; such routes do not represent the structure common of successful BRT systems in other cities. For example, WHEELS Route 20X has no stops between the Dublin/Pleasanton BART station and Livermore – the route primarily serves the major employment center at the Lawrence Livermore National Laboratory – and is a typical express bus service. Bus rapid transit is a corridor service.

Throughout the process of selecting suitable routes for further analysis, external factors and developments also played a role in determining which bus transit routes would be analyzed. Faced with difficult economic circumstances, AC Transit has canceled some bus routes, including Route 6 operating between Parkwood and Piedmont. Additionally, the recent expansion of BART to San Francisco International Airport has led to the cancellation of SamTrans Routes 193 and BX. Finally, the Contra Costa Transportation Authority (CCTA) and

BART recently co-led the SR 4 East Corridor Transit Study, whose objective was to determine what transit improvements would be timely and effective measures to provide East County residents and employees with alternatives to auto travel in the short and medium term. Transit options as well as highway improvements were considered including eBART², BART extensions, express buses, bus rapid transit, and combinations of these options. The findings from the assessment of alternatives recommended the use of eBART as the locally preferred alternative along the SR 4 corridor using Union Pacific (UP) rail right-of-way in east Contra Costa County from Pittsburg/Bay Point BART to Loveridge Road via SR 4 median then to Byron via UP's Mococo Line (8). As a follow-up to these recommendations, Tri Delta Routes 300 and 391, which serve the SR 4 corridor between Pittsburg and Brentwood, could be removed from further consideration. The result of Step 2 was the removal of 57 bus transit routes from further consideration for upgrade to bus rapid transit based on demand characteristics and external factors. A description of the 162 bus routes and the 57 routes whose demand characteristics do not support bus rapid transit operation may be found in Appendix II.

Step 3: Grouping of Bus Transit Routes that Function as a Single Service

Several bus transit routes were grouped together to represent one service based on similarities in route structures. In particular, AC Transit operates numerous transbay bus routes between San Francisco and various locations in the East Bay, many of which function essentially as one service. For example, AC Transit Routes N, NF, NG, NH, NL, and NV all operate between San Francisco and San Leandro, with minor route variations. From a BRT perspective, these bus transit routes could function effectively as one service running frequently throughout the day, rather than as separate more limited individual services assuming that the trunk line would be serviced by feeder/collector routes from surrounding neighborhoods. Similar logic was applied to AC Transit routes operating between San Francisco and Alameda, Berkeley, El Cerrito, El Sobrante, Hayward, and Trestle Glen, as well as with AC Transit Routes 72, 72M, and 72R, which all run between Richmond and Oakland. A few bus transit routes were listed by multiple transit agencies, and thus duplicates were removed during this step - for example Dumbarton Express, SamTrans, and Santa Clara VTA all list the DB and DB1 as bus routes – to avoid including these individual routes under multiple agencies. Another consolidation of routes was

² eBART is a new non-electrified operation of self-propelled Diesel Multiple Units.

for SamTrans routes 390 and 391, which travel on SR 82 (El Camino Real) and have overlapping alignments for much of their routes, even though SR 390 goes further south to Palo Alto than SR 391, while SR 391 goes further north to San Francisco than SR 390. The result of this process was the removal of 27 duplicate routes. A description of the 105 bus routes and the 27 routes that were removed due to route consolidation and duplication may be found in Appendix III.

In order to represent multiple bus transit routes that function as one, ridership figures for each of the individual routes were added to represent the total service ridership. For example, while the highest average weekday ridership of each of the AC Transit “N” routes was 800 passengers, the total average weekday ridership for all of the “N” routes was 2,500 passengers; such ridership groupings were an important input into Step 4.

Step 4: Passenger Ridership for BRT (Preliminary Examination)

The enhanced service provided by BRT implementation can potentially have the effect of attracting new riders. However, without an existing demand for transit service, a BRT system is not likely to be successful. In order to ensure that sufficient demand for transit service exists, only bus transit routes with at least a minimum threshold average weekday ridership were selected and we considered ridership on currently existing BRT systems in the U.S. Moreover, our intention was again to be conservative and choose a relatively small value so as not to omit too many bus routes based solely on this factor, yet also remain faithful to the fact that without existing demand, a BRT system is not likely to be successful. We selected a threshold of 1,000 riders for the average weekday ridership. Bus routes with less than 1,000 passengers were removed from further evaluation as potential BRT candidates.

Successfully implemented BRT corridors in the United States typically have average ridership figures significantly greater than 1,000 passengers per weekday. For example in Los Angeles, the Wilshire-Whittier Boulevard corridor carries approximately 40,000 average weekday riders. Average weekday ridership on Pittsburgh’s East Busway is approximately 9,000, while Honolulu’s CityExpress! Route A carries 11,000 average weekday passengers, and Miami-Dade’s South Busway carries about 2,100 average weekday passengers on its Busway Local

Route and about 3,500 on its Busway MAX Route. Again, we used these ridership figures only as an approximate guide.

It should be noted that the use of ridership data to select potential BRT candidates could have been done before steps 1-3; however the time involved for individual transit agencies to respond to data requests required that this step be delayed. Ultimately we were able to obtain ridership data for each of the 78 bus transit routes remaining after going through Steps 1 through 3. Ridership data was obtained by route from each transit agency for February 2003 or later; some agencies were unable to provide such data and in these instances the most recently available ridership figures were used. Table 3 shows the distribution of ridership by the volume of bus transit routes from these 78 remaining routes; the 23 bus transit routes that had an average weekday ridership greater than 1,000 passengers are detailed in Table 4 and depicted more graphically in Figure 4. A description of the 78 bus routes with their average weekday ridership estimates and the 23 bus routes with average weekday ridership of at least 1,000 may be found in Appendices IV and V, respectively.

TABLE 3 Distribution of Ridership

Average Weekday Ridership	Number of Bus Transit Routes
0 – 249	17
250 – 499	21
500 – 999	17
1,000 – 1,999	10
2,000 – 4,999	8
5,000+	5

Figure 4 shows the resulting 23 bus transit routes in the Bay Area following our selection process. These routes represent seven of the previously identified 15 transit agencies (See Table 2) and pass through every Bay Area County except Napa County. Several of these routes have been established as potential BRT corridors by individual transit agencies. We have highlighted in bold and in italics in Table 4 those four transit agencies and associated state routes, bus routes, and average weekday ridership that are currently undergoing planning for implementation as bus rapid transit systems in the Bay Area. Not surprisingly, they comprise those bus routes with the

four largest ridership volumes among the 23 routes remaining after our selection process and include:

- AC Transit's existing San Pablo corridor (Routes 72-72M-72R on SR 123)
- AC Transit's planned for bus rapid transit system (Routes 82-82L along Telegraph Avenue/International Boulevard/14th Street corridor)
- SamTrans signal priority project on El Camino Real (Routes 390/391 on SR 82)
- Santa Clara VTA's signal priority project on El Camino Real (Route 22 on SR 82)



FIGURE 4 Selected Bay Area Bus Transit Routes

TABLE 4 Characteristics of Top Twenty-Three Bus Routes

Transit Agency	State Route (SR)	Bus Route	Total Length (mi)	Length on SR (mi)	% on SR	Average Weekday Ridership
AC Transit	13/24	64	15.6	6.3	40%	1,069
AC Transit	123	72-72M-72R	16.6-16.9	9.3-11.0	56-65%	15,513
AC Transit	580/80	80	11.3	3.5	31%	1,041
AC Transit	185	82/82L	18.5	16.0	87%	22,481
AC Transit	123/80	L-LA-LB-LB1-LC	15.0-26.7	16.5-18.0	68%+	1,064
AC Transit	80/580	N-NF-NG-NH-NL-NV	17.2-31.6	11.2-16.9	53-65%	2,489
AC Transit	880/80	O-OX-OX1	15.1-19.0	8.6	45-57%	1,968
Golden Gate Transit	101	4	21.2	10.8	51%	1,485
Golden Gate Transit	101	10	24.5	8.0	33%	1,027
Golden Gate Transit	101	20	32.4	13.7	42%	3,757
Golden Gate Transit	1/101	50	41.9	18.3	44%	3,658
Golden Gate Transit	101	70	31.6	23.6	75%	1,117
Golden Gate Transit	101	80	62.1	49.0	79%	3,212
SamTrans	1	110	11.4	6.0	53%	1,179
SamTrans	82	390/391	26.7-33.9	25.0	74%-93%	13,224
SamTrans	101/82	KX	36.2	13.0	36%	2,406
San Francisco Muni	280	14X	10.1	2.6	26%	2,358
San Francisco Muni	101	9X	12.9	3.1	24%	8,340
Santa Clara VTA	82	22	27.0	15.0	55%	20,000
Santa Clara VTA	880/680	180	37.4	12.7	34%	2,000
Santa Clara VTA	82	300	24.2	14.0	57%	2,871
Vallejo Transit	80	80	21.5	14.4	67%	1,400
WestCAT	4/80/123	J	14.5	6.3	44%	1,570

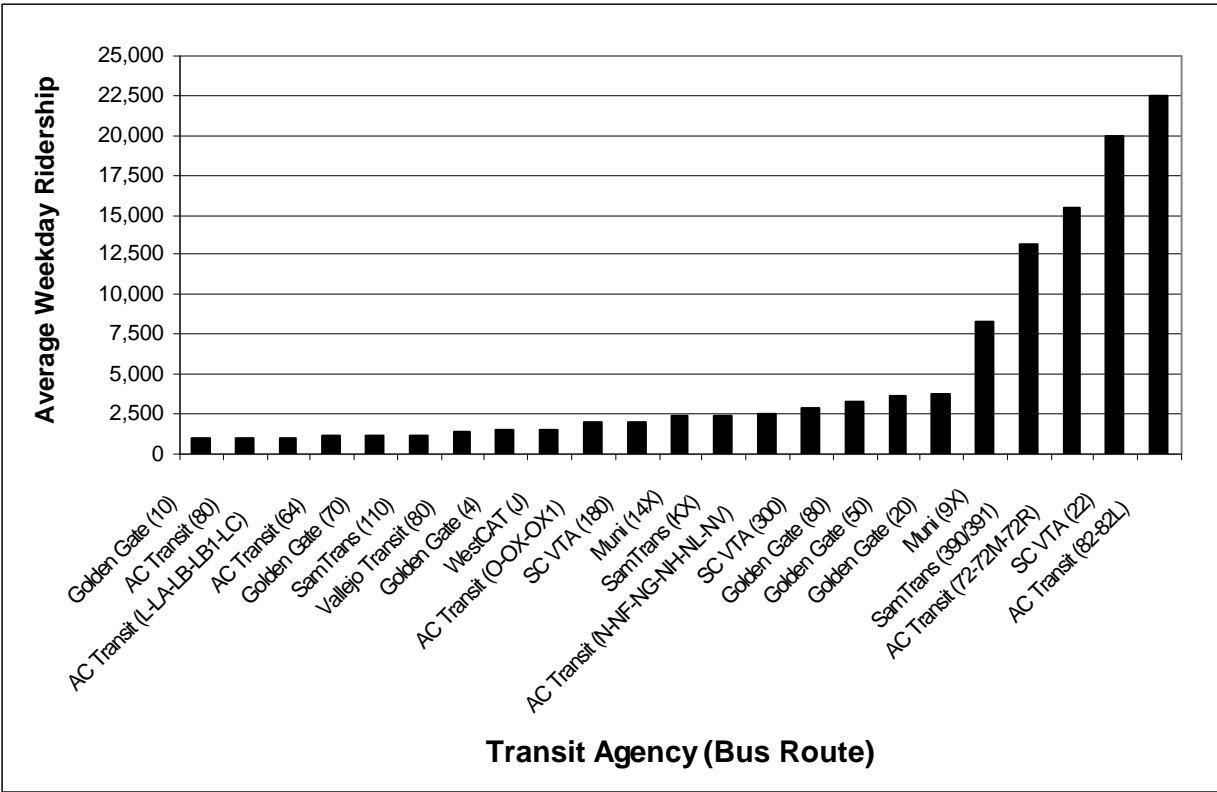


FIGURE 5 Average Weekday Ridership for Top Twenty-Three Bus Routes

The bus route with the fifth largest ridership is Muni’s route 9X that travels on US 101. Route 9X appears in three of Muni’s 13 corridors as part of its vision for rapid transit in San Francisco (3), one of which is under planning consideration for implementation of bus rapid transit³.

Step 5: Passenger Ridership for BRT (In-depth Investigation)

In this final step, we examined in more detail these 23 bus routes, again in terms of their ridership to better understand what level of ridership is needed to sustain a successful BRT service. Recall that we purposely were conservative in our selection of 1000 passengers as the cut-off value for minimum average weekday ridership needed for bus rapid transit systems. From

³ The three 9X corridors are 1. Chinatown-North Beach-Marina, 2. Geneva-Ocean, and 3. Potrero-San Bruno. Numbers 1. and 2. are being considered for LRT and #3 for BRT.

Table 4 and more obviously from Figure 5, there is a distinct and clearly defined division between 18 of the bus route corridors and the remaining five. These 18 routes' average weekday ridership ranges from a minimum of 1,027 to a maximum of 3,757. In this step we investigated more closely those currently implemented BRT corridors with the smallest average weekday ridership. We identified these corridors from the recently completed TCRP A-23 Project Report (9) and began with the corridor with the smallest ridership, namely, the Independence Boulevard busway in Charlotte, North Carolina. Our objective in this step is to search for the BRT system with the lowest ridership and use that ridership as a lower bound in our current project to more narrowly focus onto the best potential BRT candidates.

The Independence Boulevard Busway in Charlotte, North Carolina is a 2.1-mile long two-way corridor that opened in December 1998. It is located in an unused HOV lane and has no stations. The busway consists of two ten-foot lanes within a 24-foot total barrier separated roadway. It includes a queue jumper at the first outbound traffic signal that allows buses to bypass congestion. Four express bus routes operate on this busway; during the morning and evening peak periods there are buses every 4 minutes in each direction. As of January 2000, average monthly ridership was 15,700 passengers translating into approximately 1,100 passengers on an average weekday.

In 2000, there were no special vehicles or features found on this corridor, such as stations, off-vehicle fare collection, color-coding, or intelligent transportation systems (ITS). In 2001, construction began on the next mile of the HOV lane. The proposed BRT improvements included retrofitting 3.9-mile of Independence Boulevard into a bus facility with five new stations, adding ITS such as AVL, APC and real-time information on buses.

The A-23 report (9) assessment includes the following quotation:

“This system is really an elongated ‘queue bypass’ rather than an integrated BRT system. It is not a clear indication to the public of what BRT systems can achieve, for it has no stations, no ways to expedite passenger boarding, and no clear identity.”

In short, the bus service on the Independence Boulevard Busway is not really bus rapid transit. Since our current project is looking for possible BRT candidates, we continued looking for the BRT system with the smallest ridership.

The TCRP A-23 report lists the following high quality busways with the next lowest ridership values:

TABLE 5 Houston and Pittsburgh Busways

City	Facility	Weekday ridership	AM peak-hour peak direction buses	AM peak-hour peak direction riders
Houston	Eastex	4,500	22	1,150
	Northwest	6,180	34	1,500
	Gulf	6,685	21	1,200
Pittsburgh	West Busway	7,000	40	1,700
Houston	Southwest	8,900	54	No data

Busways in Houston

Houston’s High Occupancy Vehicle Lanes are used by buses, carpools, vanpools and motorcyclists and each such facility consists of a single reversible lane that is barrier separated. The HOV lanes are supported by an extensive system of park and ride facilities and operate during peak periods in the peak direction. Buses operate as express service between major activity centers. Most bus services operate only during peak periods. “They provide a timely and cost effective solution to commuting in the Houston area. The HOV lane systems are in many respects a rubber-tired commuter rail-like service.” (9). While Houston’s freeway HOV lane system has substantially improved travel speeds, they are more express bus services than BRT service.

West Busway in Pittsburgh

The 5.6-mile West Busway opened in September 2000 with 14 routes on the 6-station facility carrying approximately 7,000 riders per day. These busways are two-lane bus-only controlled access roadways. Only emergency and police vehicles, Port Authority Transit (PAT) buses and neighboring transit agency vehicles are permitted to use the facilities. At stops the busway is widened to four lanes to enable express buses to pass around stopped vehicles. The 14 routes operate along the West Busway, including six express and three flyer routes between 5AM to

midnight daily. Buses operate at about 5-7 minute headways during the morning peak period and with 10 minute headways in the evening peak period. Service frequency is 10 to 15 minutes during midday and approximately every 20 minutes during the evening. Of the 1000-vehicle fleet, 160 buses are low-floor. The low floor buses all have next stop announcements. Stations feature weather protective shelters, newspaper boxes, bike racks, telephones, security prone system, information and landscaping. About 350 park-and-ride spaces are provided at four locations. Fare collection takes place on-board buses.

The A-23 report (9) assessment includes the following quotation:

“It [Pittsburgh’s West Busway] provides a combination of frequent all-stop (typical rapid transit) and express services. The busway is state of the art facility. Reliable safe speeds of 30-40 mph along the busway clearly classify the service on it as rapid transit. The bus rapid transit aspects of the busway service could be enhanced by using distinctive, specially delineated buses with wide doors and low floors for busway All-Stop service, and by providing off-vehicle fare collection.”

Therefore, the West Busway in Pittsburgh is the BRT system with the lowest documented ridership. For our current research we will use its ridership as the minimum weekday ridership for a successful BRT system. Hence we have identified our 5 best candidates for BRT in the Bay Area (Table 6).

TABLE 6 Five Top Candidate Corridors for Bus Rapid Transit in San Francisco Bay Area

Transit Agency	State Route (SR)	Bus Route	Average Weekday Ridership (Number of Passengers)
AC Transit	185	82/82L	22,481
Santa Clara VTA	82	22	20,000
AC Transit	123	72-72M-72R	15,513
SamTrans	82	390/391	13,224
San Francisco Muni	101	9X	8,340

It is noteworthy that these five top candidate corridors reflect precisely ongoing bus rapid transit corridor activities in the San Francisco Bay Area (See Section 2 “BRT Activities in the Bay Area”). This finding helps support the validity of the more non-traditional and top-down

approach taken in this project to initially focus on state routes to identify potential bus rapid transit corridors.

5. CONCLUSIONS

Since the objective of the current project is to identify transit routes that could support a BRT service we recommend investigating the potential benefits that an upgrade to BRT could bring to these bus routes. At this stage in the project we are soliciting input from Caltrans to assist us in selecting a single bus route corridor from this list of five on which to perform more in-depth analysis. We are considering several criteria to make the final bus route corridor selection including the route corridor 1) with the highest average weekday ridership in order to benefit the most riders possible 2) with two transit agencies operating on it thus bringing together additional opportunities for organizational collaboration and coordination, 3) with a bus rapid transit system that is already in operation, and 4) that is currently only at the initial stage of being considered for bus rapid transit system operation.

Furthermore, we recommend keeping in mind that even if a full BRT service cannot yet be implemented, there are potential interim solutions (such as express routes, or HOV lanes) that could improve the quality of service on these routes and potentially improve the service on the other 18 routes whose average weekday ridership is between 1,000 and 4,000 passengers.

6. REFERENCES

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5. DKS Associates, et al. 2002 High Occupancy Vehicle (HOV) Lane Master Plan Update Final Summary Report, Metropolitan Transportation Commission, Caltrans District 4, and the California Highway Patrol Golden Gate Division, March 2003.
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Appendix I – 188 Bus Routes Traveling Along State Routes

Transit Agency	State Route	Bus Route	Route Description	Remarks
AC TRANSIT (56 Routes)				
AC Transit	13	6	Parkwood - Piedmont	
AC Transit	123	7	Del Norte BART - Rockridge BART	LESS THAN 1 MILE IN LENGTH
AC Transit	123	17	Powell Plaza - Rockridge BART	LESS THAN 1 MILE IN LENGTH
AC Transit	880	35X	Kaiser Center - Alameda	
AC Transit	880	36X	Kaiser Center - Hayward	
AC Transit	123	52/52L	U.C. Village - U.C. Campus	
AC Transit	123	57/57C	Emeryville Amtrak - Bayfair BART	LESS THAN 1 MILE IN LENGTH
AC Transit	580	58X	Downtown Oakland - MacArthur Blvd. Express	
AC Transit	13/24	64	Downtown Berkeley - Merritt College	
AC Transit	123	70	El Cerrito Del Norte BART - Richmond Parkway Transit Center	
AC Transit	123	72	Richmond - Downtown Oakland	
AC Transit	123	72M	Richmond - Downtown Oakland (Former Route 73)	
AC Transit	123	72R	San Pablo Rapid Bus (Former Route 72L)	
AC Transit	123	78	Richmond BART - Contra Costa College	APPROXIMATELY 1 MILE IN LENGTH
AC Transit	580/80	80	San Leandro BART - Castro Valley	
AC Transit	185	82/82L	West Oakland - Hayward BART	
AC Transit	80	90	Hayward BART - Hesperian Blvd.	
AC Transit	123/80	376	North Richmond Shuttle	APPROXIMATELY 1 MILE IN LENGTH
AC Transit	80	A	San Francisco - Oakland Owl	
AC Transit	80	B	San Francisco - Trestle Glen	
AC Transit	80	BX	San Francisco - Trestle Glen	
AC Transit	80	C	San Francisco - Piedmont	
AC Transit	80	CB	San Francisco - Montclair	
AC Transit	580/80	E	San Francisco - Claremont	
AC Transit	80	F	San Francisco - Berkeley	
AC Transit	80	FS	San Francisco - Berkeley	
AC Transit	80	G	San Francisco - El Cerrito	
AC Transit	13/80	H	San Francisco - El Cerrito	
AC Transit	80	HX	San Francisco - El Cerrito	
AC Transit	80	K	San Francisco - San Leandro	
AC Transit	880/80	KH	San Francisco - San Leandro	
AC Transit	123/80	L	San Francisco - El Sobrante	
AC Transit	80	LA	San Francisco - LA Hilltop	
AC Transit	123/80	LB	San Francisco - El Sobrante	
AC Transit	123/80	LB1	San Francisco - El Sobrante	
AC Transit	123/80	LC	San Francisco - El Sobrante	
AC Transit	80	LD	San Francisco - Richmond	
AC Transit	80	N	San Francisco - San Leandro	
AC Transit	80	NF	San Francisco - San Leandro	
AC Transit	80	NG	San Francisco - San Leandro	
AC Transit	580/80	NH	San Francisco - San Leandro	
AC Transit	80	NL	San Francisco - San Leandro	
AC Transit	580/80	NV	San Francisco - San Leandro	
AC Transit	880/80	O	San Francisco - Alameda	
AC Transit	880/80	OX	San Francisco - Alameda	
AC Transit	880/80	OX1	San Francisco - Alameda	
AC Transit	80	P	San Francisco - Piedmont	
AC Transit	580/80	RCV	San Francisco - Castro Valley	
AC Transit	880/80	S	San Francisco - Hayward	
AC Transit	880/80	SA	San Francisco - Hayward	
AC Transit	880/80	SB	San Francisco - Newark	
AC Transit	13/80	V	San Francisco - Montclair	
AC Transit	880/80	W	San Francisco - Alameda	
AC Transit	880/80	WA	San Francisco - Alameda	
AC Transit	80/123	Y	San Francisco - Emeryville	
AC Transit	80	Z	San Francisco - Albany	
COUNTY CONNECTION (9 Routes)				
County Connection	580	121	Walnut Creek/San Ramon Valley	LESS THAN 1 MILE IN LENGTH
County Connection	4/680	308	Concord BART/Martinez Amtrak (Sundays only)	
County Connection	680	920	Walnut Creek/Danville/San Ramon ACE Shuttle	
County Connection	4	930	Kirker Pass Express	
County Connection	24	206L	Lafayette Loop	LESS THAN 1 MILE IN LENGTH
County Connection	680	960B	Bishop Ranch Express from Bollinger Canyon Road	
County Connection	680	960C	Bishop Ranch Express from Crow Canyon Road	
County Connection	680	970B	San Ramon Commuter Express from Bollinger Canyon Road	
County Connection	680	970C	San Ramon Commuter Express from Crow Canyon Road	
DUMBARTON EXPRESS (2 Routes)				
Dumbarton Express	84	DB	Dumbarton Express (Union City BART - Palo Alto)	
Dumbarton Express	84	DB1	Dumbarton Express (Union City BART - Palo Alto)	
FAIRFIELD-SUISUN TRANSIT (3 Routes)				
Fairfield-Suisun Transit	80	20	Fairfield / Vacaville	
Fairfield-Suisun Transit	80	30	Fairfield / Vacaville / Dixon / UC Davis	
Fairfield-Suisun Transit	680/80	40	Solano BART Express	

Transit Agency	SR	BR	Route Description
GOLDEN GATE TRANSIT (35 Routes)			
Golden Gate Transit	101	1	Novato-San Rafael-College Of Marin
Golden Gate Transit	101	2	Marin Headlands-Marin City-San Francisco
Golden Gate Transit	101	4	Mill Valley-San Francisco
Golden Gate Transit	101	5	Mill Valley-Strawberry-Sausalito Ferry
Golden Gate Transit	101	8	Tiburon-San Francisco
Golden Gate Transit	101	9	Strawberry-Reed Ranch Road-Tiburon Ferry
Golden Gate Transit	101	10	Tiburon-Mill Valley-Sausalito-San Francisco
Golden Gate Transit	101	18	San Anselmo-College Of Marin-Corte Madera-San Francisco
Golden Gate Transit	101	20	Canal-San Anselmo-Corte Madera-San Francisco
Golden Gate Transit	101	21	C.O.M.-Mill Valley
Golden Gate Transit	101	24	Lagunitas-Manor-San Anselmo-Greenbrae-San Francisco
Golden Gate Transit	101	25	Sleepy Hollow-San Rafael-Larkspur Ferry
Golden Gate Transit	101	26	Sleepy Hollow-San Rafael-San Francisco
Golden Gate Transit	101	28	San Rafael-Canal-Larkspur Landing-San Francisco
Golden Gate Transit	101	32	Peacock Gap-San Rafael-San Francisco
Golden Gate Transit	101	34	Santa Venetia-San Rafael-San Francisco
Golden Gate Transit	101	37	Terra Linda-San Rafael-Larkspur Ferry Terminal
Golden Gate Transit	101	38	Terra Linda-San Francisco
Golden Gate Transit	580/101	40	San Rafael - Del Norte BART Express
Golden Gate Transit	101	44	Lucas Valley-San Francisco
Golden Gate Transit	101	48	Novato-Ignacio-San Francisco
Golden Gate Transit	1/101	50	San Marin-Novato-San Rafael-Sausalito-San Francisco
Golden Gate Transit	101	51	San Marin-South Novato Blvd.-Larkspur Ferry Terminal
Golden Gate Transit	101	54	San Marin-Novato Blvd.-San Francisco
Golden Gate Transit	101	56	San Marin-Rowland Park & Ride - San Francisco
Golden Gate Transit	101	60	San Rafael-San Francisco
Golden Gate Transit	1	63	Stinson Beach-Marín City
Golden Gate Transit	101	70	Novato-San Rafael-San Francisco
Golden Gate Transit	101	72	Santa Rosa-Rohnert Park Expressway-San Francisco
Golden Gate Transit	101	74	Santa Rosa-Rohnert Park-Petaluma-San Francisco
Golden Gate Transit	101	75	Santa Rosa-Marín Civic Center-San Rafael-Phoenix Leasing
Golden Gate Transit	101	76	Rohnert Park-East Petaluma-San Francisco
Golden Gate Transit	101	80	Santa Rosa-Novato-San Rafael-San Francisco
Golden Gate Transit	101	93	Golden Gate Bridge-S.F.Civic Center- Mission Street
Golden Gate Transit	101	97	Larkspur Ferry-San Francisco

Remarks

SAMTRANS (24 Routes)			
SamTrans	1	15	Half Moon Bay - Pescadero
SamTrans	1	17	Coast Shuttle (Moss Beach - Half Moon Bay)
SamTrans	1	110	Linda Mar - Daly City BART
SamTrans	1	112	Linda Mar-Serramonte-Colma BART
SamTrans	35	121	Skyline College - Lowell/Hanover
SamTrans	82	130	Daly City BART - South San Francisco
SamTrans	82	193	SF Airport - Daly City BART - Stonestown SC
SamTrans	92	250	College of San Mateo - 2nd & Main
SamTrans	82	261	San Carlos Train-Brittan/Crestview-San Carlos Train
SamTrans	82	262	Alameda & Ralston - Hillsdale SC
SamTrans	82	271	Redwood City Caltrain - Roosevelt
SamTrans	1/82	294	Pacifica - Half Moon Bay - Hillsdale Caltrain
SamTrans	82	390	Palo Alto - Redwood City - Daly City BART
SamTrans	82	391	Redwood City - Colma BART - San Francisco
SamTrans	82	397	San Francisco - Palo Alto Caltrain
SamTrans	280/380	BX	Colma BART - SF Airport - Colma BART
SamTrans	1	CX	Linda Mar - Colma BART
SamTrans	82	DB	Dumbarton Express (Union City BART - Palo Alto)
SamTrans	1/280	DX	Pacifica-San Francisco
SamTrans	101	FX	Foster City - San Francisco Express
SamTrans	101/82	KX	Palo Alto - SFO - San Francisco
SamTrans	101/82/380	MX	San Mateo - San Francisco
SamTrans	101	NX	Redwood Shores-San Francisco
SamTrans	101/82	PX	Redwood City-San Francisco

APPROXIMATELY 1 MILE IN LENGTH
LESS THAN 1 MILE IN LENGTH

APPROXIMATELY 1 MILE IN LENGTH
LESS THAN 1 MILE IN LENGTH
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LESS THAN 1 MILE IN LENGTH

SAN FRANCISCO MUNI (2 Routes)			
San Francisco Muni	280	14X	Mission Limited / Express
San Francisco Muni	101	9X	San Bruno Express

Transit Agency	SR	BR	Route Description
SANTA CLARA VTA (21 Routes)			
Santa Clara VTA	82	22	Eastridge - Palo Alto/Menlo Park
Santa Clara VTA	82	34	Santa Clara Caltrain - San Antonio Shopping Center
Santa Clara VTA	82	52	Mountain View Caltrain - Foothill College
Santa Clara VTA	82	56	Milpitas - Sunnyvale
Santa Clara VTA	17	76	Los Gatos - Summit Road
Santa Clara VTA	280	101	Camden/Hwy. 85 - Palo Alto
Santa Clara VTA	85/280	102	Santa Teresa LRT Station - Palo Alto
Santa Clara VTA	237/101	104	East San Jose - Palo Alto
Santa Clara VTA	101	122	Santa Teresa LRT Station - Lockheed Martin
Santa Clara VTA	680	140	Fremont BART - Sunnyvale Caltrain
Santa Clara VTA	880/237	141	Fremont BART - Great America
Santa Clara VTA	880/680	180	Fremont BART - San Jose Caltrain
Santa Clara VTA	82	300	East San Jose - Palo Alto Caltrain
Santa Clara VTA	82	305	South San Jose - Mountain View
Santa Clara VTA	280/87/85	501	Palo Alto - IBM Bailey
Santa Clara VTA	280/680	503	Eastridge - Palo Alto
Santa Clara VTA	237/101/680	520	Fremont BART - Lockheed Martin - Shoreline Industrial Park
Santa Clara VTA	101	521	Gilroy - Lockheed Martin
Santa Clara VTA	82	DB	Dumbarton Express (Union City BART - Palo Alto)
Santa Clara VTA	101	DB1	Dumbarton Express (Union City BART - Palo Alto)
Santa Clara VTA	17/280	HWY17	Highway 17 Express (Santa Cruz - San Jose)

Remarks

LESS THAN 1 MILE IN LENGTH
 LESS THAN 1 MILE IN LENGTH
 LESS THAN 1 MILE IN LENGTH

SONOMA COUNTY TRANSIT (7 Routes)			
Sonoma County Transit	12/116	20	Occidental-Monte Rio-Santa Rosa
Sonoma County Transit	12	22	Downtown Sebastopol-Downtown Santa Rosa Express
Sonoma County Transit	116	24	Sebastopol Area Local Service
Sonoma County Transit	116	26	Sebastopol-Rohnert Park-Sonoma State University
Sonoma County Transit	12	30	Santa Rosa-Sonoma Valley
Sonoma County Transit	12	34	Sonoma Valley Local Commute
Sonoma County Transit	116	40	Sonoma Valley-Petaluma

LESS THAN 1 MILE IN LENGTH

TRI DELTA TRANSIT (5 Routes)			
Tri Delta Transit	4	200	Bay Point / Tri Delta Antioch (Weekdays only)
Tri Delta Transit	4	300	Pittsburg BART / Brentwood (Weekdays only / commute hours)
Tri Delta Transit	4	391	Pittsburg BART / Brentwood Park & Ride (Weekdays only)
Tri Delta Transit	4	393	Pittsburg BART / Hillcrest Park & Ride (Sat, Sun & Holidays only)
Tri Delta Transit	4	DX	Lawrence Livermore Lab/Sandia Lab Delta Express

UNION CITY TRANSIT (1 Route)			
Union City Transit	238	4	Seven Hills

LESS THAN 1 MILE IN LENGTH

VALLEJO TRANSIT (3 Routes)			
Vallejo Transit	80	80	Vallejo/El Cerrito Del Norte BART
Vallejo Transit	80	90	Vacaville - Suisun/Fairfield to BART
Vallejo Transit	80	91	Vacaville - Suisun/Fairfield to BART

VINE (1 Route)			
VINE	29	10	Vallejo-Napa-Calistoga

WESTCAT (8 Routes)			
WestCAT	123	11	Crockett/Rodeo
WestCAT	123	16	Pinole Valley
WestCAT	123	17	BayView
WestCAT	123	18	Tara Hills
WestCAT	123	19	Hilltop/Hercules
WestCAT	4/80/123	30Z	Martinez Link
WestCAT	4/80/123	J	Rodeo/Hercules/Pinole/Hilltop/El Cerrito Del Norte BART
WestCAT	80	JX	Hercules Transit Center/El Cerrito Del Norte BART

LESS THAN 1 MILE IN LENGTH
 LESS THAN 1 MILE IN LENGTH
 APPROXIMATELY 1 MILE IN LENGTH
 APPROXIMATELY 1 MILE IN LENGTH

WHEELS (11 Routes)			
Wheels	84	7	Valley / Downtown Pleasanton / Case Ave / BART
Wheels	84	8	Vintage Hills / Downtown Pleasanton / Valley / BART
Wheels	84	11	Springtown via First Street / Civic Center
Wheels	580/680	70	Prime Time Route 70 Walnut Creek
Wheels	680	71	Prime Time Lockheed / Sunnyvale
Wheels	680	72	Prime Time Intel / Santa Clara
Wheels	84	601	Pleasanton M.S. - Ruby Hill - Sunol and Mission
Wheels	84	606	Pleasanton M.S. - First & Vineyard - Case and Bernal
Wheels	84	11L	Granada / Livermore High School
Wheels	580	12X	Livermore / BART Express
Wheels	580	20X	Vasco Road / Livermore Labs / BART

LESS THAN 1 MILE IN LENGTH
 LESS THAN 1 MILE IN LENGTH

LESS THAN 1 MILE IN LENGTH
 LESS THAN 1 MILE IN LENGTH

Appendix II – 162 Bus Routes Traveling More Than One Mile on State Routes

Transit Agency	SR	BR	Route Description	Remarks	
AC TRANSIT (51 Routes)					
AC Transit	13	6	Parkwood - Piedmont	TO BE DISCONTINUED LIMITED SERVICE; NB SERVICE HAS 3D IN AM AND 3D IN PM; SB SERVICE HAS 2D AM AND 4D IN PM W/ 30-45 MIN HDWYS. LIMITED SERVICE; 2D AM @ 6:48 & 7:23 WB; 2D PM @ 4:30 & 5:05 EB; SPECIALIZED SHUTTLE FOR UC RUN BY AC OWL SERVICE EXPRESS SERVICE WITH ONLY FEW LOCAL COLLECTOR STOPS, NONE ON SR SPECIALIZED/LIMITED WEEKDAY COMMUTE PERIOD SERVICE: EB PM SERVICE @ 5:10 & 5:50 W/ 2D & 40 MIN HDWY; WB AM SERVICE @ 7:05 & 7:45 W/ 2D & 40 MIN HDWY; NO WKEND SERVICE.	
AC Transit	880	35X	Kaiser Center - Alameda		
AC Transit	880	36X	Kaiser Center – Hayward		
AC Transit	123	52/52L	U.C. Village - U.C. Campus		
AC Transit	580	58X	Downtown Oakland - MacArthur Blvd. Express		
AC Transit	13/24	64	Downtown Berkeley - Merritt College		
AC Transit	123	70	El Cerrito Del Norte BART - Richmond Parkway Transit Center		
AC Transit	123	72	Richmond - Downtown Oakland		
AC Transit	123	72M	Richmond - Downtown Oakland (Former Route 73)		
AC Transit	123	72R	San Pablo Rapid Bus (Former Route 72L)		
AC Transit	580/80	80	San Leandro BART - Castro Valley		
AC Transit	185	82/82L	West Oakland - Hayward BART		
AC Transit	80	90	Hayward BART - Hesperian Blvd.		
AC Transit	80	A	San Francisco - Oakland Owl		
AC Transit	80	B	San Francisco - Trestle Glen		
AC Transit	80	BX	San Francisco - Trestle Glen		
AC Transit	80	C	San Francisco - Piedmont		
AC Transit	80	CB	San Francisco - Montclair		
AC Transit	580/80	E	San Francisco - Claremont		
AC Transit	80	F	San Francisco - Berkeley		
AC Transit	80	FS	San Francisco - Berkeley		
AC Transit	80	G	San Francisco - El Cerrito		
AC Transit	13/80	H	San Francisco - El Cerrito		
AC Transit	80	HX	San Francisco - El Cerrito		
AC Transit	80	K	San Francisco - San Leandro		
AC Transit	880/80	KH	San Francisco - San Leandro		
AC Transit	123/80	L	San Francisco - El Sobrante		
AC Transit	80	LA	San Francisco - LA Hilltop		
AC Transit	123/80	LB	San Francisco - El Sobrante		
AC Transit	123/80	LB1	San Francisco - El Sobrante		
AC Transit	123/80	LC	San Francisco - El Sobrante		
AC Transit	80	LD	San Francisco - Richmond		
AC Transit	80	N	San Francisco - San Leandro		
AC Transit	80	NF	San Francisco - San Leandro		
AC Transit	80	NG	San Francisco - San Leandro		
AC Transit	580/80	NH	San Francisco - San Leandro		
AC Transit	80	NL	San Francisco - San Leandro		
AC Transit	580/80	NV	San Francisco - San Leandro		
AC Transit	880/80	O	San Francisco - Alameda		
AC Transit	880/80	OX	San Francisco - Alameda		
AC Transit	880/80	OX1	San Francisco - Alameda		
AC Transit	80	P	San Francisco - Piedmont		
AC Transit	580/80	RCV	San Francisco - Castro Valley		
AC Transit	880/80	S	San Francisco - Hayward		
AC Transit	880/80	SA	San Francisco - Hayward		
AC Transit	880/80	SB	San Francisco - Newark		
AC Transit	13/80	V	San Francisco - Montclair		
AC Transit	880/80	W	San Francisco - Alameda		
AC Transit	880/80	WA	San Francisco - Alameda		
AC Transit	80/123	Y	San Francisco - Emeryville		
AC Transit	80	Z	San Francisco - Albany		
COUNTY CONNECTION (7 Routes)					
County Connection	4/680	308	Concord BART/Martinez Amtrak (Sundays only)		SUNDAY ONLY
County Connection	680	920	Walnut Creek/Danville/San Ramon ACE Shuttle		
County Connection	4	930	Kirker Pass Express		
County Connection	680	960B	Bishop Ranch Express from Bollinger Canyon Road		
County Connection	680	960C	Bishop Ranch Express from Crow Canyon Road		
County Connection	680	970B	San Ramon Commuter Express from Bollinger Canyon Road		
County Connection	680	970C	San Ramon Commuter Express from Crow Canyon Road		
DUMBARTON EXPRESS (2 Routes)					
Dumbarton Express	84	DB	Dumbarton Express (Union City BART - Palo Alto)		
Dumbarton Express	84	DB1	Dumbarton Express (Union City BART - Palo Alto)		
FAIRFIELD-SUISUN TRANSIT (3 Routes)					
Fairfield-Suisun Transit	80	20	Fairfield / Vacaville	PART OF BART EXPRESS SERVICE	
Fairfield-Suisun Transit	80	30	Fairfield / Vacaville / Dixon / UC Davis		
Fairfield-Suisun Transit	680/80	40	Solano BART Express		

Transit Agency	SR	BR	Route Description
GOLDEN GATE TRANSIT (35 Routes)			
Golden Gate Transit	101	1	Novato-San Rafael-College Of Marin
Golden Gate Transit	101	2	Marin Headlands-Marín City-San Francisco
Golden Gate Transit	101	4	Mill Valley-San Francisco
Golden Gate Transit	101	5	Mill Valley-Strawberry-Sausalito Ferry
Golden Gate Transit	101	8	Tiburon-San Francisco
Golden Gate Transit	101	9	Strawberry-Reed Ranch Road-Tiburon Ferry
Golden Gate Transit	101	10	Tiburon-Mill Valley-Sausalito-San Francisco
Golden Gate Transit	101	18	San Anselmo-College Of Marin-Corte Madera-San Francisco
Golden Gate Transit	101	20	Canal-San Anselmo-Corte Madera-San Francisco
Golden Gate Transit	101	21	C.O.M.-Mill Valley
Golden Gate Transit	101	24	Lagunitas-Manor-San Anselmo-Greenbrae-San Francisco
Golden Gate Transit	101	25	Sleepy Hollow-San Rafael-Larkspur Ferry
Golden Gate Transit	101	26	Sleepy Hollow-San Rafael-San Francisco
Golden Gate Transit	101	28	San Rafael-Canal-Larkspur Landing-San Francisco
Golden Gate Transit	101	32	Peacock Gap-San Rafael-San Francisco
Golden Gate Transit	101	34	Santa Venetia-San Rafael-San Francisco
Golden Gate Transit	101	37	Terra Linda-San Rafael-Larkspur Ferry Terminal
Golden Gate Transit	101	38	Terra Linda-San Francisco
Golden Gate Transit	580/101	40	San Rafael - Del Norte BART Express
Golden Gate Transit	101	44	Lucas Valley-San Francisco
Golden Gate Transit	101	48	Novato-Ignacio-San Francisco
Golden Gate Transit	1/101	50	San Marin-Novato-San Rafael-Sausalito-San Francisco
Golden Gate Transit	101	51	San Marin-South Novato Blvd.-Larkspur Ferry Terminal
Golden Gate Transit	101	54	San Marin-Novato Blvd.-San Francisco
Golden Gate Transit	101	56	San Marin-Rowland Park & Ride - San Francisco
Golden Gate Transit	101	60	San Rafael-San Francisco
Golden Gate Transit	1	63	Stinson Beach-Marín City
Golden Gate Transit	101	70	Novato-San Rafael-San Francisco
Golden Gate Transit	101	72	Santa Rosa-Rohnert Park Expressway-San Francisco
Golden Gate Transit	101	74	Santa Rosa-Rohnert Park-Petaluma-San Francisco
Golden Gate Transit	101	75	Santa Rosa-Marín Civic Center-San Rafael-Phoenix Leasing
Golden Gate Transit	101	76	Rohnert Park-East Petaluma-San Francisco
Golden Gate Transit	101	80	Santa Rosa-Novato-San Rafael-San Francisco

Remarks

AVG WKDY RDRSHP 1685 PASSENGERS;
TOTAL LENGTH ~25 MILES 1 MILE OF WHICH IS
ON SR (US 101)

SPECIALIZED SHUTTLE SERVICE; RUNS ONLY
3X/DAY, 2AM-1PM

LIMITED WKDY COMMUTE SERVICE NB PM
BTW 4:30 & 5:35 W/ 4D 15-25 MIN HDWYS; SB
AM BTW 6:30 & 8:30 W/ 5D 30 MIN HDWYS; AVG
WKDY RDRSHP 194 PASSENGERS (SEPT 2002
DATA)

SPECIALIZED/LIMITED WEEKDAY COMMUTE
PERIOD SERVICE (FERRY CONNECTOR); NB
PM SERVICE BTW 4:50 & 6:40 W/ 3D & 50-60
MIN HDWYS; SB AM SERVICE BWT 5:30 & 8:10
W/ 4D & 50-60 MIN HDWYS; NO WKEND
SERVICE; AVG WKDY RDRSHP 69
PASSENGERS

SPECIALIZED/LIMITED WEEKDAY COMMUTE
PERIOD SERVICE (FERRY CONNECTOR); NB
PM SERVICE BTW 5:40 & 7:10 W/ 4D & 15-50
MIN HDWYS; SB AM SERVICE BWT 6 & 7:20 W/
3D & 40-50 MIN HDWYS; NO WKEND SERVICE.

SPECIALIZED/LIMITED WEEKDAY COMMUTE
PERIOD SERVICE (FERRY CONNECTOR); NB
PM SERVICE BTW 4:40 & 5:10 W/ 2D & 30 MIN
HDWY; SB AM SERVICE BWT 6:45 & 7 W/ 2D &
25 MIN HDWY; NO WKEND SERVICE.

SPECIALIZED/LIMITED WEEKDAY COMMUTE
PERIOD SERVICE: NB PM SERVICE BTW 4:10 &
6 W/ 3D & 60 MIN HDWY; SB AM SERVICE BWT
6:10 & 7:10 W/ 2D & 25-30 MIN HDWY; NO
WKEND SERVICE.

SPECIALIZED/LIMITED WEEKDAY COMMUTE
PERIOD SERVICE: NB PM SERVICE BTW 4:30 &
6:10 W/ 3D & 50 MIN HDWY; SB AM SERVICE
BWT 5:30 & 7 W/ 4D & 30 MIN HDWY; NO
WKEND SERVICE.

SPECIALIZED/LIMITED WEEKDAY COMMUTE
PERIOD SERVICE (FERRY CONNECTOR): NB
PM SERVICE BTW 5:40 & 6:30 W/ 3D & 15-30
MIN HDWYS; SB AM SERVICE BWT 6 & 7:20 W/
3D & 30-50 MIN HDWYS; NO WKEND SERVICE.

SPECIALIZED EXPRESS SERVICE; NO
INTERMEDIATE STOPS

SPECIALIZED/LIMITED WEEKDAY COMMUTE
PERIOD SERVICE: NB PM SERVICE BTW 4:30 &
5:30 W/ 3D & 25-30 MIN HDWYS; SB AM
SERVICE BWT 5:50 & 7 W/ 3D & 30 MIN HDWY;
NO WKEND SERVICE.

SPECIALIZED SHUTTLE SERVICE; RUNS ONLY
2X IN AM AND ONE HOUR IN PM

SPECIALIZED/LIMITED WEEKDAY COMMUTE
PERIOD EXPRESS SERVICE: NB PM SERVICE
@ 2PM AND 6PM & 4HR HDWY; SB AM SERVICE
ONLY 1D @ 4:35;
WEEKEND SERVICE ONLY

SPECIALIZED/LIMITED WEEKDAY COMMUTE
PERIOD SERVICE: NB PM SERVICE BTW 2:50 &
5 W/ 4D & 35-60 MIN HDWYS; SB AM SERVICE
BWT 5:10 & 6:30 W/ 4D & 25-30 MIN HDWYS;
NO WKEND SERVICE.

Transit Agency	SR	BR	Route Description
SAMTRANS (18 Routes)			
SamTrans	1	15	Half Moon Bay - Pescadero
SamTrans	1	17	Coast Shuttle (Moss Beach - Half Moon Bay)
SamTrans	1	110	Linda Mar - Daly City BART
SamTrans	1	112	Linda Mar-Serramonte-Colma BART
SamTrans	82	193	SF Airport - Daly City BART - Stonestown SC
SamTrans	1/92	294	Pacifica - Half Moon Bay - Hillsdale Caltrain
SamTrans	82	390	Palo Alto - Redwood City - Daly City BART
SamTrans	82	391	Redwood City - Colma BART - San Francisco
SamTrans	82	397	San Francisco - Palo Alto Caltrain
SamTrans	280/380	BX	Colma BART - SF Airport - Colma BART
SamTrans	1	CX	Linda Mar - Colma BART
SamTrans	82	DB	Dumbarton Express (Union City BART - Palo Alto)
SamTrans	1/280	DX	Pacifica-San Francisco
SamTrans	101	FX	Foster City - San Francisco Express
SamTrans	101/82	KX	Palo Alto - SFO - San Francisco
SamTrans	101/82/380	MX	San Mateo - San Francisco
SamTrans	101	NX	Redwood Shores-San Francisco
SamTrans	101/82	PX	Redwood City-San Francisco
SAN FRANCISCO MUNI (2 Routes)			
San Francisco Muni	280	14X	Mission Limited / Express
San Francisco Muni	101	9X	9X San Bruno Express

Remarks

SPECIALIZED/LIMITED WEEKDAY COMMUTE PERIOD SERVICE NB AM & PM SERVICE 6:30 & 7:45 AM, 6 & 7 PM; SB AM & PM SERVICE 6 & 7:15 AM, 5:30 & 6:30 PM; NO WKEND SERVICE.

TO BE DISCONTINUED

SERVICE RUNS IN THE MIDDLE OF THE NIGHT; NB BTW 12:45 & 2:45 W/ 2D HOURLY HDWYS; SB BTW 1:15 & 4:15 W/ 4D HOURLY HDWYS. TO BE DISCONTINUED

SPECIALIZED/LIMITED WEEKDAY COMMUTE PERIOD SERVICE: NB AM SERVICE @ 6:20 & 7 W/ 2D & 40 MIN HDWY; SB PM SERVICE @ 4:40 & 5:20 W/ 2D & 40 MIN HDWY; NO WKEND SERVICE.

Transit Agency	SR	BR	Route Description
SANTA CLARA VTA (18 Routes)			
Santa Clara VTA	82	22	Eastridge - Palo Alto/Menlo Park
Santa Clara VTA	17	76	Los Gatos - Summit Road
Santa Clara VTA	280	101	Camden/Hwy. 85 - Palo Alto
Santa Clara VTA	85/280	102	Santa Teresa LRT Station - Palo Alto
Santa Clara VTA	237/101	104	East San Jose - Palo Alto
Santa Clara VTA	101	122	Santa Teresa LRT Station - Lockheed Martin
Santa Clara VTA	680	140	Fremont BART - Sunnyvale Caltrain
Santa Clara VTA	880/237	141	Fremont BART - Great America
Santa Clara VTA	880/680	180	Fremont BART - San Jose Caltrain
Santa Clara VTA	82	300	East San Jose - Palo Alto Caltrain
Santa Clara VTA	82	305	South San Jose - Mountain View
Santa Clara VTA	280/87/85	501	Palo Alto - IBM Bailey
Santa Clara VTA	280/680	503	Eastridge - Palo Alto
Santa Clara VTA	237/101/680	520	Fremont BART - Lockheed Martin - Shoreline Industrial Park
Santa Clara VTA	101	521	Gilroy - Lockheed Martin
Santa Clara VTA	82	DB	Dumbarton Express (Union City BART - Palo Alto)
Santa Clara VTA	101	DB1	Dumbarton Express (Union City BART - Palo Alto)
Santa Clara VTA	17/280	HWY17	Highway 17 Express (Santa Cruz - San Jose)

Remarks

SPECIALIZED/LIMITED WEEKDAY COMMUTE PERIOD SERVICE: AM BTW 6:20 & 7:20, 2D; PM BWT 2:30 & 5, 3D; - 1HR HDWYS; AVG WKDY RDRSHP: 80 PASSENGERS

SPECIALIZED/LIMITED WEEKDAY COMMUTE PERIOD SERVICE: AM BTW 5:45 & 7:15, 4D; PM BWT 3:40 & 5:45, 4D; - 30-40 MIN HDWYS; AVG WKDY RDRSHP: 135 PASSENGERS

SPECIALIZED/LIMITED WEEKDAY COMMUTE PERIOD SERVICE: AM BTW 6 & 7:20, 3D; PM BWT 3:30 & 5:10, 3D; - 30-60 MIN HDWYS; AVG WKDY RDRSHP: 129 PASSENGERS

SPECIALIZED/LIMITED WEEKDAY COMMUTE PERIOD SERVICE: AM BTW 3:15 & 4:30, 3D; PM BWT 5:30 & 7, 3D; - 35-45 MIN HDWYS; AVG WKDY RDRSHP: 137 PASSENGERS

SPECIALIZED/LIMITED WEEKDAY COMMUTE PERIOD SERVICE: ONLY AM DEPARTURE @ 5:50; ONLY PM DEPARTURE @ 4:40; AVG WKDY RDRSHP: 110 PASSENGERS

WEEKEND ONLY SERVICE

SPECIALIZED/LIMITED WEEKDAY COMMUTE PERIOD SERVICE: AM BTW 5 & 6:45, 3D; PM BWT 3 & 4:50, 3D; - 50-60 MIN HDWYS; AVG WKDY RDRSHP: 153 PASSENGERS

SPECIALIZED/LIMITED WEEKDAY COMMUTE PERIOD SERVICE: AM BTW 7 & 7:30, 2D; PM BWT 4:50 & 5:30, 2D; - 30-40 MIN HDWYS; AVG WKDY RDRSHP: 63 PASSENGERS

SPECIALIZED/LIMITED WEEKDAY COMMUTE PERIOD SERVICE: AM BTW 5:10 & 7:20, 4D; PM BWT 2:40 & 5:10, 4D; - 40-55 MIN HDWYS; AVG WKDY RDRSHP: 155 PASSENGERS

SPECIALIZED/LIMITED WEEKDAY COMMUTE PERIOD SERVICE: AM BTW 5 & 7:10, 3D; PM BWT 2:45 & 5, 3D; - 40-75 MIN HDWYS; AVG WKDY RDRSHP: 90 PASSENGERS

SPECIALIZED/LIMITED WEEKDAY COMMUTE PERIOD SERVICE: AM BTW 4:40 & 6:20, 4D; PM BWT 2:45 & 5, 4D; - 30-60 MIN HDWYS; AVG WKDY RDRSHP: 158 PASSENGERS

SONOMA COUNTY TRANSIT (6 Routes)			
Sonoma County Transit	12/116	20	Occidental-Monte Rio-Santa Rosa
Sonoma County Transit	12	22	Downtown Sebastopol-Downtown Santa Rosa Express
Sonoma County Transit	116	26	Sebastopol-Rohnert Park-Sonoma State University
Sonoma County Transit	12	30	Santa Rosa-Sonoma Valley
Sonoma County Transit	12	34	Sonoma Valley Local Commute
Sonoma County Transit	116	40	Sonoma Valley-Petaluma

LIMITED EXPRESS SERVICE BIDIRECTIONAL IN AM & PM; EB W/ 4D AM & 2D PM; 30MIN & 2.5 HR HDWYS; WB W/ 2D AM & 4D PM; 2HR AM HDWY & 1-4.5HR PM HDWY

LIMITED SERVICE AM & PM; 6D EB W/ 3D AM & 3D PM, 90-150 MIN HDWYS; WB 1D AM & 3D PM W/ 75-90 MIN HDWYS.

EXPRESS SERVICE EB & WB; 1 EB D 6:35AM; 1 WB D 5:30PM; NO WEEKEND SERVICE

LIMITED SERVICE AM & PM; 9D EB W/ 5D AM & 4D PM, 40-90 MIN HDWYS; 6D WB W/ 3D AM & 3D PM W/2-2.75 HR HDWYS; 85-105 MIN HDWYS.

Transit Agency	SR	BR	Route Description
TRI DELTA TRANSIT (5 Routes)			
Tri Delta Transit	4	200	Bay Point / Tri Delta Antioch (Weekdays only)
Tri Delta Transit	4	300	Pittsburg BART / Brentwood (Weekdays only / commute hours)
Tri Delta Transit	4	391	Pittsburg BART / Brentwood Park & Ride (Weekdays only)
Tri Delta Transit	4	393	Pittsburg BART / Hillcrest Park & Ride (Sat, Sun & Holidays only)
Tri Delta Transit	4	DX	Lawrence Livermore Lab/Sandia Lab Delta Express

Remarks

LOCALLY PREFERRED ALTERNATIVE IS eBART

LOCALLY PREFERRED ALTERNATIVE IS eBART WEEKEND SERVICE ONLY

SPECIALIZED/LIMITED WEEKDAY COMMUTE PERIOD SERVICE: NB PM SERVICE BTW 4 & 5 W/ 2D & 60 MIN HDWY; SB AM SERVICE BWT 5:30 & 6:30 W/ 2D & 60 MIN HDWY; NO WKEND SERVICE, AVG WKDY RDRSHP 79 PASSENGERS

VALLEJO TRANSIT (3 Routes)			
Vallejo Transit	80	80	Vallejo/El Cerrito Del Norte BART
Vallejo Transit	80	90	Vacaville - Suisun/Fairfield to BART
Vallejo Transit	80	91	Vacaville - Suisun/Fairfield to BART

VINE (1 Route)			
VINE	29	10	Vallejo-Napa-Calistoga

WESTCAT (4 Routes)			
WestCAT	123	11	Crockett/Rodeo
WestCAT	4/80/123	30Z	Martinez Link
WestCAT	4/80/123	J	Rodeo/Hercules/Pinole/Hilltop/El Cerrito Del Norte BART
WestCAT	80	JX	Hercules Transit Center/El Cerrito Del Norte BART

NO STOPS IN BETWEEN BART STATION AND LIVERMORE

WHEELS (7 Routes)			
Wheels	84	11	Springtown via First Street / Civic Center
Wheels	580/680	70	Prime Time Route 70 Walnut Creek
Wheels	680	71	Prime Time Lockheed / Sunnyvale
Wheels	680	72	Prime Time Intel / Santa Clara
Wheels	84	11L	Granada / Livermore High School
Wheels	580	12X	Livermore / BART Express
Wheels	580	20X	Vasco Road / Livermore Labs / BART

SPECIALIZED SHUTTLE AMONG 3 BART STATIONS AND ONE EMPLOYER

SPECIALIZED SHUTTLE BETWEEN 2 P-&-R LOTS AND ONE EMPLOYER

SPECIALIZED SHUTTLE BETWEEN 2 P-&-R LOTS AND ONE EMPLOYER

SCHOOL BUS ROUTE

NO STOPS IN BETWEEN BART STATION AND LIVERMORE; SHUTTLE BETWEEN BART AND 1 EMPLOYER

NO STOPS IN BETWEEN BART STATION AND LIVERMORE; SHUTTLE BETWEEN BART AND 1 EMPLOYER

Appendix III – 105 Bus Routes with BRT-Like Service Characteristics

Transit Agency	SR	BR	Route Description	Remarks	
AC TRANSIT (44 Routes)					
AC Transit	580	58X	Downtown Oakland - MacArthur Blvd. Express		
AC Transit	13/24	64	Downtown Berkeley - Merritt College		
AC Transit	123	70	El Cerrito Del Norte BART - Richmond Parkway Transit Center		
AC Transit	123	72	Richmond - Downtown Oakland	CONSOLIDATE ALL "72-72M-72R" ROUTES BTWN RICHMOND & OAKLAND INTO ONE	
AC Transit	123	72M	Richmond - Downtown Oakland (Former Route 73)		
AC Transit	123	72R	San Pablo Rapid Bus (Former Route 72L)		
AC Transit	580/80	80	San Leandro BART - Castro Valley		
AC Transit	185	82/82L	West Oakland - Hayward BART		
AC Transit	80	90	Hayward BART - Hesperian Blvd.		
AC Transit	80	B	San Francisco - Trestle Glen	CONSOLIDATE ALL "B" ROUTES TO TRESTLE GLEN INTO ONE	
AC Transit	80	BX	San Francisco - Trestle Glen		
AC Transit	80	C	San Francisco - Piedmont		
AC Transit	80	CB	San Francisco - Montclair		
AC Transit	580/80	E	San Francisco - Claremont		
AC Transit	80	F	San Francisco - Berkeley	CONSOLIDATE ALL "F" ROUTES TO BERKELEY INTO ONE	
AC Transit	80	FS	San Francisco - Berkeley		
AC Transit	80	G	San Francisco - El Cerrito		
AC Transit	13/80	H	San Francisco - El Cerrito	CONSOLIDATE ALL "H" ROUTES TO EL CERRITO INTO ONE	
AC Transit	80	HX	San Francisco - El Cerrito		
AC Transit	80	K	San Francisco - San Leandro	CONSOLIDATE ALL "K" ROUTES TO SAN LEANDRO IN TO ONE	
AC Transit	880/80	KH	San Francisco - San Leandro		
AC Transit	123/80	L	San Francisco - El Sobrante	CONSOLIDATE ALL "L" ROUTES TO EL SOBRANTE INTO ONE	
AC Transit	80	LA	San Francisco - LA Hilltop		
AC Transit	123/80	LB	San Francisco - El Sobrante		
AC Transit	123/80	LB1	San Francisco - El Sobrante		
AC Transit	123/80	LC	San Francisco - El Sobrante		
AC Transit	80	LD	San Francisco - Richmond		
AC Transit	80	N	San Francisco - San Leandro	CONSOLIDATE ALL "N" ROUTES TO SAN LEANDRO INTO ONE	
AC Transit	80	NF	San Francisco - San Leandro		
AC Transit	80	NG	San Francisco - San Leandro		
AC Transit	580/80	NH	San Francisco - San Leandro		
AC Transit	80	NL	San Francisco - San Leandro		
AC Transit	580/80	NV	San Francisco - San Leandro		
AC Transit	880/80	O	San Francisco - Alameda		CONSOLIDATE ALL "O" ROUTES TO ALAMEDA INTO ONE
AC Transit	880/80	OX	San Francisco - Alameda		
AC Transit	880/80	OX1	San Francisco - Alameda		
AC Transit	580/80	RCV	San Francisco - Castro Valley		
AC Transit	880/80	S	San Francisco - Hayward	CONSOLIDATE ALL "S" ROUTES TO HAYWARD INTO ONE	
AC Transit	880/80	SA	San Francisco - Hayward		
AC Transit	880/80	SB	San Francisco - Newark		
AC Transit	13/80	V	San Francisco - Montclair		
AC Transit	880/80	W	San Francisco - Alameda	CONSOLIDATE ALL "W" ROUTES TO ALAMEDA INTO ONE	
AC Transit	880/80	WA	San Francisco - Alameda		
AC Transit	80	Z	San Francisco - Albany		
COUNTY CONNECTION (6 Routes)					
County Connection	680	920	Walnut Creek/Danville/San Ramon ACE Shuttle		
County Connection	4	930	Kirker Pass Express		
County Connection	680	960B	Bishop Ranch Express from Bollinger Canyon Road	CONSOLIDATE ALL "BISHOP RANCH EXPRESS" ROUTES INTO ONE	
County Connection	680	960C	Bishop Ranch Express from Crow Canyon Road		
County Connection	680	970B	San Ramon Commuter Express from Bollinger Canyon Road	CONSOLIDATE ALL "SAN RAMON COMMUTER EXPRESS" ROUTES INTO ONE	
County Connection	680	970C	San Ramon Commuter Express from Crow Canyon Road		
DUMBARTON EXPRESS (2 Routes)					
Dumbarton Express	84	DB	Dumbarton Express (Union City BART - Palo Alto)	CONSOLIDATE ALL "DUMBARTON EXPRESS" ROUTES INTO ONE	
Dumbarton Express	84	DB1	Dumbarton Express (Union City BART - Palo Alto)		
FAIRFIELD-SUISUN TRANSIT (2 Routes)					
Fairfield-Suisun Transit	80	20	Fairfield / Vacaville		
Fairfield-Suisun Transit	80	30	Fairfield / Vacaville / Dixon / UC Davis		

Transit Agency	SR	BR	Route Description
GOLDEN GATE TRANSIT (18 Routes)			
Golden Gate Transit	101	2	Marin Headlands-Marín City-San Francisco
Golden Gate Transit	101	4	Mill Valley-San Francisco
Golden Gate Transit	101	10	Tiburon-Mill Valley-Sausalito-San Francisco
Golden Gate Transit	101	18	San Anselmo-College Of Marin-Corte Madera-San Francisco
Golden Gate Transit	101	20	Canal-San Anselmo-Corte Madera-San Francisco
Golden Gate Transit	101	21	C.O.M.-Mill Valley
Golden Gate Transit	101	24	Lagunitas-Manor-San Anselmo-Greenbrae-San Francisco
Golden Gate Transit	101	26	Sleepy Hollow-San Rafael-San Francisco
Golden Gate Transit	101	38	Terra Linda-San Francisco
Golden Gate Transit	101	44	Lucas Valley-San Francisco
Golden Gate Transit	1/101	50	San Marin-Novato-San Rafael-Sausalito-San Francisco
Golden Gate Transit	101	54	San Marin-Novato Blvd.-San Francisco
Golden Gate Transit	101	56	San Marin-Rowland Park & Ride - San Francisco
Golden Gate Transit	101	70	Novato-San Rafael-San Francisco
Golden Gate Transit	101	72	Santa Rosa-Rohnert Park Expressway-San Francisco
Golden Gate Transit	101	74	Santa Rosa-Rohnert Park-Petaluma-San Francisco
Golden Gate Transit	101	76	Rohnert Park-East Petaluma-San Francisco
Golden Gate Transit	101	80	Santa Rosa-Novato-San Rafael-San Francisco

Remarks

SAMTRANS (13 Routes)			
SamTrans	1	17	Coast Shuttle (Moss Beach - Half Moon Bay)
SamTrans	1	110	Linda Mar - Daly City BART
SamTrans	1	112	Linda Mar-Serramonte-Colma BART
SamTrans	1/92	294	Pacifica - Half Moon Bay - Hillsdale Caltrain
SamTrans	82	390	Palo Alto - Redwood City - Daly City BART
SamTrans	82	391	Redwood City - Colma BART - San Francisco
SamTrans	1	CX	Linda Mar - Colma BART
SamTrans	82	DB	Dumbarton Express (Union City BART - Palo Alto)
SamTrans	1/280	DX	Pacifica-San Francisco
SamTrans	101	FX	Foster City - San Francisco Express
SamTrans	101/82	KX	Palo Alto - SFO - San Francisco
SamTrans	101/82/380	MX	San Mateo - San Francisco
SamTrans	101/82	PX	Redwood City-San Francisco

COSOLIDATE "390-991" ROUTES INTO ONE

COSOLIDATE ALL "DUMBARTON EXPRESS" ROUTES INTO ONE

SAN FRANCISCO MUNI (2 Routes)			
San Francisco Muni	280	14X	Mission Limited / Express
San Francisco Muni	101	9X	9X San Bruno Express

SANTA CLARA VTA (7 Routes)			
Santa Clara VTA	82	22	Eastridge - Palo Alto/Menlo Park
Santa Clara VTA	680	140	Fremont BART - Sunnyvale Caltrain
Santa Clara VTA	880/680	180	Fremont BART - San Jose Caltrain
Santa Clara VTA	82	300	East San Jose - Palo Alto Caltrain
Santa Clara VTA	82	DB	Dumbarton Express (Union City BART - Palo Alto)
Santa Clara VTA	101	DB1	Dumbarton Express (Union City BART - Palo Alto)
Santa Clara VTA	17/280	HWY17	Highway 17 Express (Santa Cruz - San Jose)

COSOLIDATE ALL "DUMBARTON EXPRESS" ROUTES INTO ONE

SONOMA COUNTY TRANSIT (2 Routes)			
Sonoma County Transit	12/116	20	Occidental-Monte Rio-Santa Rosa
Sonoma County Transit	12	30	Santa Rosa-Sonoma Valley

Transit Agency	SR	BR	Route Description
TRI DELTA TRANSIT (1 Route)			
Tri Delta Transit	4	200	Bay Point / Tri Delta Antioch (Weekdays only)
VALLEJO TRANSIT (3 Routes)			
Vallejo Transit	80	80	Vallejo/EI Cerrito Del Norte BART
Vallejo Transit	80	90	Vacaville - Suisun/Fairfield to BART
Vallejo Transit	80	91	Vacaville - Suisun/Fairfield to BART
VINE (1 Route)			
VINE	29	10	Vallejo-Napa-Calistoga
WESTCAT (3 Routes)			
WestCAT	123	11	Crockett/Rodeo
WestCAT	4/80/123	30Z	Martinez Link
WestCAT	4/80/123	J	Rodeo/Hercules/Pinole/Hilltop/EI Cerrito Del Norte BART
WHEELS (1 Route)			
Wheels	84	11	Springtown via First Street / Civic Center

Remarks

COSOLIDATE "90-91" ROUTES INTO ONE

Appendix IV – 78 Bus Routes Representing Distinct Services

Transit Agency	SR	BR	Route Description	Avg. Weekday Ridership
AC TRANSIT (25 Routes)				
AC Transit	580	58X	Downtown Oakland - MacArthur Blvd. Express	300
AC Transit	13/24	64	Downtown Berkeley - Merritt College	1,069
AC Transit	123	70	El Cerrito Del Norte BART - Richmond Parkway Transit Center	818
AC Transit	123	72-72M-72R	Richmond - Downtown Oakland	15,513
AC Transit	580/80	80	San Leandro BART - Castro Valley	1,041
AC Transit	185	82/82L	West Oakland - Hayward BART	22,481
AC Transit	80	90	Hayward BART - Hesperian Blvd.	664
AC Transit	80	B-BX	San Francisco - Trestle Glen	200
AC Transit	80	C	San Francisco - Piedmont	321
AC Transit	80	CB	San Francisco - Montclair	154
AC Transit	580/80	E	San Francisco - Claremont	252
AC Transit	80	F-FS	San Francisco - Berkeley	949
AC Transit	80	G	San Francisco - El Cerrito	421
AC Transit	13/80	H-HX	San Francisco - El Cerrito	478
AC Transit	880/80	K-KH	San Francisco - San Leandro	297
AC Transit	123/80	L-LA-LB-LB1-LC	San Francisco - El Sobrante	1,064
AC Transit	80	LD	San Francisco - Richmond	164
AC Transit	80/580	N-NF-NG-NH-NL-NV	San Francisco - San Leandro	2,489
AC Transit	880/80	O-OX-OX1	San Francisco - Alameda	1,968
AC Transit	580/80	RCV	San Francisco - Castro Valley	259
AC Transit	880/80	S-SA	San Francisco - Hayward	423
AC Transit	880/80	SB	San Francisco - Newark	370
AC Transit	13/80	V	San Francisco - Montclair	713
AC Transit	880/80	W-WA	San Francisco - Alameda	507
AC Transit	80	Z	San Francisco - Albany	126
COUNTY CONNECTION (4 Routes)				
County Connection	680	920	Walnut Creek/Danville/San Ramon ACE Shuttle	94
County Connection	4	930	Kirker Pass Express	216
County Connection	680	960B/C	Bishop Ranch Express	559
County Connection	680	970B/C	San Ramon Commuter Express	162
DUMBARTON EXPRESS (1 Route)				
Dumbarton Express	84	DB-DB1	Dumbarton Express (Union City BART - Palo Alto)	921
FAIRFIELD-SUISUN TRANSIT (2 Routes)				
Fairfield-Suisun Transit	80	20	Fairfield / Vacaville	196
Fairfield-Suisun Transit	80	30	Fairfield / Vacaville / Dixon / UC Davis	60
GOLDEN GATE TRANSIT (18 Routes)				
Golden Gate Transit	101	2	Marin Headlands-Marin City-San Francisco	378
Golden Gate Transit	101	4	Mill Valley-San Francisco	1,485
Golden Gate Transit	101	10	Tiburon-Mill Valley-Sausalito-San Francisco	1,027
Golden Gate Transit	101	18	San Anselmo-College Of Marin-Corte Madera-San Francisco	550
Golden Gate Transit	101	20	Canal-San Anselmo-Corte Madera-San Francisco	3,757
Golden Gate Transit	101	21	C.O.M.-Mill Valley	191
Golden Gate Transit	101	24	Lagunitas-Manor-San Anselmo-Greenbrae-San Francisco	819
Golden Gate Transit	101	26	Sleepy Hollow-San Rafael-San Francisco	399
Golden Gate Transit	101	38	Terra Linda-San Francisco	352
Golden Gate Transit	101	44	Lucas Valley-San Francisco	184
Golden Gate Transit	1/101	50	San Marin-Novato-San Rafael-Sausalito-San Francisco	3,658
Golden Gate Transit	101	54	San Marin-Novato Blvd.-San Francisco	920
Golden Gate Transit	101	56	San Marin-Rowland Park & Ride - San Francisco	430
Golden Gate Transit	101	70	Novato-San Rafael-San Francisco	1,117
Golden Gate Transit	101	72	Santa Rosa-Rohnert Park Expressway-San Francisco	640
Golden Gate Transit	101	74	Santa Rosa-Rohnert Park-Petaluma-San Francisco	821
Golden Gate Transit	101	76	Rohnert Park-East Petaluma-San Francisco	570
Golden Gate Transit	101	80	Santa Rosa-Novato-San Rafael-San Francisco	3,212
SAMTRANS (11 Routes)				
SamTrans	1	17	Coast Shuttle (Moss Beach - Half Moon Bay)	193
SamTrans	1	110	Linda Mar - Daly City BART	1,179
SamTrans	1	112	Linda Mar-Serramonte-Colma BART	707
SamTrans	1/92	294	Pacifica - Half Moon Bay - Hillsdale Caltrain	413
SamTrans	82	390-391	Palo Alto - San Francisco	13,224
SamTrans	1	CX	Linda Mar - Colma BART	261
SamTrans	1/280	DX	Pacifica-San Francisco	316
SamTrans	101	FX	Foster City - San Francisco Express	424
SamTrans	101/82	KX	Palo Alto - SFO - San Francisco	2,406
SamTrans	101/82/380	MX	San Mateo - San Francisco	188
SamTrans	101/82	PX	Redwood City-San Francisco	229

Transit Agency	SR	BR	Route Description	Avg. Weekday Ridership
SAN FRANCISCO MUNI (2 Routes)				
San Francisco Muni	280	14X	Mission Limited / Express	2,358
San Francisco Muni	101	9X	9X San Bruno Express	8,340
SANTA CLARA VTA (5 Routes)				
Santa Clara VTA	82	22	Eastridge - Palo Alto/Menlo Park	20,000
Santa Clara VTA	680	140	Fremont BART - Sunnyvale Caltrain	169
Santa Clara VTA	880/680	180	Fremont BART - San Jose Caltrain	2,000
Santa Clara VTA	82	300	East San Jose - Palo Alto Caltrain	2,871
Santa Clara VTA	17/280	HWY17	Highway 17 Express (Santa Cruz - San Jose)	616
SONOMA COUNTY TRANSIT (2 Routes)				
Sonoma County Transit	12/116	20	Occidental-Monte Rio-Santa Rosa	450
Sonoma County Transit	12	30	Santa Rosa-Sonoma Valley	450
TRI DELTA TRANSIT (1 Route)				
Tri Delta Transit	4	200	Bay Point / Tri Delta Antioch (Weekdays only)	141
VALLEJO TRANSIT (2 Routes)				
Vallejo Transit	80	80	Vallejo/EI Cerrito Del Norte BART	1,400
Vallejo Transit	80	90-91	Vacaville - Suisun/Fairfield to BART	544
VINE (1 Route)				
VINE	29	10	Vallejo-Napa-Calistoga	750
WESTCAT (3 Routes)				
WestCAT	123	11	Crockett/Rodeo	305
WestCAT	4/80/123	30Z	Martinez Link	176
WestCAT	4/80/123	J	Rodeo/Hercules/Pinole/Hilltop/EI Cerrito Del Norte BART	1,570
WHEELS (1 Route)				
Wheels	84	11	Springtown via First Street / Civic Center	278

Appendix V – 23 Bus Routes With Average Weekday Ridership > 1,000 Passengers

Transit Agency	SR	BR	Route Description	Avg. Weekday Ridership
AC TRANSIT (7 Routes)				
AC Transit	13/24	64	Downtown Berkeley - Merritt College	1,069
AC Transit	123	72-72M-72R	Richmond - Downtown Oakland	15,513
AC Transit	580/80	80	San Leandro BART - Castro Valley	1,041
AC Transit	185	82/82L	West Oakland - Hayward BART	22,481
AC Transit	123/80	L-LA-LB-LB1-LC	San Francisco - El Sobrante	1,064
AC Transit	80/580	N-NF-NG-NH-NL-NV	San Francisco - San Leandro	2,489
AC Transit	880/80	O-OX-OX1	San Francisco - Alameda	1,968
GOLDEN GATE TRANSIT (6 Routes)				
Golden Gate Transit	101	4	Mill Valley-San Francisco	1,485
Golden Gate Transit	101	10	Tiburon-Mill Valley-Sausalito-San Francisco	1,027
Golden Gate Transit	101	20	Canal-San Anselmo-Corte Madera-San Francisco	3,757
Golden Gate Transit	1/101	50	San Marin-Novato-San Rafael-Sausalito-San Francisco	3,658
Golden Gate Transit	101	70	Novato-San Rafael-San Francisco	1,117
Golden Gate Transit	101	80	Santa Rosa-Novato-San Rafael-San Francisco	3,212
SAMTRANS (3 Routes)				
SamTrans	1	110	Linda Mar - Daly City BART	1,179
SamTrans	82	390-391	Palo Alto - San Francisco	13,224
SamTrans	101/82	KX	Palo Alto - SFO - San Francisco	2,406
SAN FRANCISCO MUNI (2 Routes)				
San Francisco Muni	280	14X	Mission Limited / Express	2,358
San Francisco Muni	101	9X	9X San Bruno Express	8,340
SANTA CLARA VTA (3 Routes)				
Santa Clara VTA	82	22	Eastridge - Palo Alto/Menlo Park	20,000
Santa Clara VTA	880/680	180	Fremont BART - San Jose Caltrain	2,000
Santa Clara VTA	82	300	East San Jose - Palo Alto Caltrain	2,871
VALLEJO TRANSIT (1 Route)				
Vallejo Transit	80	80	Vallejo/El Cerrito Del Norte BART	1,400
WESTCAT (1 Route)				
WestCAT	4/80/123	J	Rodeo/Hercules/Pinole/Hilltop/El Cerrito Del Norte BART	1,570