CHAPTER 3: TRANSPORTATION ANALYSIS

This chapter describes existing and projected future transportation conditions in the project area. It includes the following four sections: 1) transit, 2) vehicular traffic, 3) non-motorized traffic, and 4) parking. The transit section describes current and future rail and bus services and patronage. The vehicular traffic section describes the existing and future street and highway system in the corridor. The non-motorized traffic section focuses on existing pedestrian/bicycle traffic patterns, and future pedestrian walkways, bike paths, and attractors. The parking section describes existing parking amounts, locations, accessibility, and future needs.

The information provides a baseline to assess the level of impact to existing transit services for each of the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project (Terminal/Extension Project) alternatives. Existing rail transit and bus service in and around the Terminal/Extension Project study area and planned future rail and bus service are described. See Figure 3-1 for a map illustrating the transit network in the study area.

3.1 TRANSIT

3.1.1 EXISTING RAIL TRANSIT SERVICES

Caltrain, BART, and Muni Metro provide rail service in the study area. Service consists of commuter rail, heavy rail, light rail transit, and historic streetcar trolleys. BART and Muni Metro serve the Market Street subway located along the north edge of the study area. Caltrain provides passenger rail service from the south bay to the San Francisco terminal at Fourth and Townsend Streets. Figure 3-1 shows the rail transit network in the study area.

3.1.1.1 Caltrain

Caltrain provides commuter rail service between Santa Clara County and San Francisco. The Peninsula Corridor Joint Powers Board (JPB), a joint powers agency consisting of San Francisco, San Mateo, and Santa Clara counties, operates the service. The 77-mile rail line serves 34 stations. The San Francisco terminal at Fourth and Townsend Streets is approximately 1.3 miles from the Transbay Terminal at Mission and First Streets. On weekends and during off-peak hours, the main southern terminal is the Tamien Station in San Jose, which provides a connection with the Santa Clara County light rail system. Of the 80 one-way weekday train trips on Caltrain, five morning trips originate and five evening trips terminate at the Gilroy Station. Figure 3.1-1 shows the Caltrain corridor and stations.

Figure 3-1: Existing Transit Network in the Study Area

Figure 3.1-1: Caltrain Corridor with 34 Stations

At the Fourth and Townsend Station, Caltrain connects with the Muni N-Judah light rail and nine Muni bus lines. The station is also served by an Amtrak bus connection to the Amtrak rail station in Emeryville. Connections with SamTrans are not provided at Fourth and Townsend but are available at 11 South Bay train stations (or within one block of these stations). Connections with Santa Clara Valley Transportation Authority (VTA) bus lines are available at 15 South Bay Caltrain stations. Currently there is no direct connection between Caltrain and BART. Table 3.1-1 summarizes Muni, SamTrans, and VTA connecting bus services at Caltrain Stations. Table 3.1-2 details Muni service at the Fourth and Townsend Station.

Table 3.1-1
Connecting Bus Service at Caltrain Stations

Caltrain	Feeder Bus Service
Fourth & Townsend	Muni 10, 15, 30, 38L, 45, 47, 80x, 81x, 82x, N-Judah Light Rail
22nd Street	Muni 48
Paul Avenue	Muni 29
Bayshore	Muni 9, 9X, 15, 56; SamTrans 292
South San Francisco	SamTrans 130, 131, 32, 34, 292
San Bruno	SamTrans 40, 41
Millbrae	SamTrans MX, 242, 390, 391
Broadway	SamTrans 292; Burlingame Free Bee
Burlingame	SamTrans 292; Burlingame Free Bee
San Mateo	SamTrans TX, 250, 292, 295
Hayward Park	Shelter only; no ticket sales
Bay Meadows	Race days only
Hillsdale	SamTrans KX, TX, 250, 262, 390, 391, 292, 294, 295
Belmont	SamTrans KX, PX, TX, 260, 262, 390
San Carlos	SamTrans KX, PX, TX, 261, 390
Redwood City	SamTrans KX, PX, RX, 270, 271, 390, 391
Atherton	Shelter only; no ticket sales
Menlo Park	SamTrans KX, RX, 390, 295, 296
Palo Alto	SamTrans KX, PX, RX, 280, 281, 282, 390, 391; SCVTA 22, 35, 86, 300
Stanford	Football days only
California Avenue	SCVTA 24, 88, Marguerite Shuttle
San Antonio	SCVTA 32, 35, 50, 86
Mountain View	SCVTA 20, 50, 51, 52, 145, 304, 304A
Sunnyvale	SCVTA 32, 53, 54, 55, 56, 140, 26 (Weekends)
Lawrence	SCVTA 41, 43, 145, 304A
Santa Clara	SCVTA 10, 22, 32, 34, 44, 60, 300, 304A
College Park	SCVTA 36, 62
San Jose	SCVTA 11, 22, 63, 64, 65, 68, 180, 300, 304A, Hwy. 17
Tamien	SCVTA 25, 67, 82, Light Rail
Capitol	SCVTA 66, 68, 304, 304-A
Blossom Hill	SCVTA 67
Morgan Hill	SCVTA 14, 15, 521
San Martin	SCVTA 18, 18A, 19, 68, 521
Gilroy	SCVTA 18, 18A, 19, 68, 521

Source: Muni, SamTrans, Santa Clara Valley Transportation Authority, Nelson/Nygaard, 2002.

Table 3.1-2
Muni Service at the Fourth and Townsend Caltrain Station

Bus Line	Typical Weekday Hours of Operation	Typical Headways in Minutes					Average Weekday Route Passengers	Estimated Weekday Boardings and Alightings at the Caltrain Station
		Weekday			Sat.	Sun.		
		Peak	Base	Eve.	Base	Base		
10-Townsend	5:30 AM - 1:20 AM	10	12	15	12	12	N/A	N/A
15-Third Street	4:45 AM - 1:30 AM	5-10	10	15	10	10	27,735	1,623
30-Stockton	5:00 AM - 2:00 AM	4-5	5-10	8-10	6	5-10	26,428	3,071
45-Union/Stockton	5:30 AM - 2:00 AM	6-9	6	15-17	12	15	19,344	2,252
47- Van Ness	6:00 AM - 1:15 AM	6-7	7-8	12-15	7-8	7-8	N/A	N/A
76 - Marin Headlands	Daytime Sundays Only	-	-	-	60	60	N/A	N/A
80x- Caltrain Express	7:00 AM - 9:30 AM; 3:30 PM - 6:15 PM	6-10	-	-	-	-	526	756
81x- Caltrain Express	6:15 AM - 9:30 AM; 3:35 PM - 6:00 PM	5-30	-	-	-	-	718	843
82x- Presidio & Wharves Express	6:15 AM -9:15 AM; 3:30 PM - 6:40 PM	20-30	-	-	-	-	711	477
N-Judah Light Rail	5:00 AM - 1:45 AM	8	10	12	10	12	39,051	3,455

Notes: Service on the 10-Townsend and 47-Van Ness Lines began on June 9, 2000. Estimated boardings and alightings on the N-Judah refer only to the peak period (6 AM -9 AM and 3:30 PM to 7:00 PM) rather than a full day of service.

Sources: Muni published schedules, February 2001; Muni Monitoring Data, FY 99 - 00

Weekday Caltrain service is a combination of express and local service. Weekday service hours are from 4:30 a.m. to midnight. Saturday service operates from 6:00 a.m. to midnight. Sunday service operates from 7:30 a.m. to 10:30 p.m. Frequencies during the weekday peak period vary between five and 30 minutes. During the midday, trains run every 30 minutes. During evenings, trains run every 60 minutes. On weekends, trains run every 60 to 120 minutes.

Caltrain's fares are based upon travel zones that were adjusted July 1, 1998. The system is divided into nine fare zones. One-way adult fares vary from $1.25 for travel within one zone to $6.25 for traveling the entire length of the 77-mile corridor. Disabled patrons and seniors ride for approximately half the regular one-way adult fare. Children under five ride free when accompanied by a fare-paying adult. Children between five and 11 years ride for approximately half the adult fare. A monthly ticket is available for unlimited rides between a specified number of zones. On weekends and holidays, the monthly ticket is valid for travel between all zones served by Caltrain. A Caltrain monthly ticket valid for two or more zones is good as local fare credit on all SamTrans and VTA buses. Discount monthly tickets are available to persons 17 years old and younger with a valid ID, seniors, disabled patrons or high school students older than 17. One-way weekday discount tickets are 25 percent off the regular fare and valid only on weekday trains that are scheduled to start their runs at San Jose or San Francisco stations between the morning and afternoon peaks. Ten-ride tickets and weekend passes are also available for purchase.

Weekday Caltrain ridership in February 2001 is estimated at 35,609 passengers with almost 20 percent of the daily passengers boarding at the San Francisco Fourth and Townsend Station. During the morning peak, 27 percent of the passengers exit at the San Francisco terminus. During the afternoon peak, 39 percent of the passengers exit at Caltrain stops in San Mateo County and 44 percent exit at stops in Santa Clara County.[1] Table 3.1-3 shows the weekday boardings and alightings at Caltrain stations.

3.1.1.2 BART

BART provides heavy rail passenger service in the metropolitan Bay Area. The grade-separated service operates at high speeds of up to 80 miles per hour. BART currently has five operating lines: Pittsburg/Bay Point–Colma, Fremont–Daly City, Richmond–Daly City/Colma, Fremont–Richmond, and Dublin/Pleasanton–Daly City. All lines except the Fremont–Richmond line serve downtown San Francisco via a subway directly beneath Market Street.

BART shares four stations in downtown San Francisco with Muni Metro: Embarcadero, Montgomery, Powell and Civic Center. BART passengers can also make connections to the Muni bus lines serving Market Street. Although there is not a direct transfer connection between BART and Caltrain, Muni's N-Judah light rail connects the Embarcadero Station with Caltrain's Fourth and Townsend terminus.

BART's service hours are approximately 4:00 a.m. to midnight, Monday through Friday; 6:00 a.m. to midnight on Saturday; and 8:00 a.m. to midnight on Sunday. BART operates direct service between Pittsburg/Bay Point and Colma, Fremont and Richmond, as well as Dublin/Pleasanton and Daly City seven days a week during all service hours. At night and all day Sunday, only these three routes operate, requiring passengers to transfer if their destination is on a line that is not in service. Transfer stations are at the 12th Street / Oakland City Center Station, the MacArthur Station, and the Bay Fair Station. The West Oakland Station is also used as an "unofficial transfer station." Table 3.1-4 summarizes the frequency of BART trains.

BART's fare structure is built on a distance-based formula. The fare for most one-way trips wholly within San Francisco is $1.10. An additional $0.05 is charged for travel from the downtown Market Street subway stations to the Balboa Park Station. An additional $0.60 is charged for travel from the Daly City and Colma stations. One-way fares from downtown San Francisco to the East Bay range from $2.05 to $4.10. The maximum one-way fare is $4.70, from Colma to the Pittsburg/Bay Point Station.

BART has several discount passes. The blue high-value tickets with fare values of $35 and $48 are sold at a 6.25 percent discount. BART red tickets offer a 75 percent discount for disabled persons and children aged five to 12. BART green tickets offer a 75 percent discount for seniors. BART orange tickets provide a 50 percent discount for middle or secondary school students. The BART Plus ticket works in the BART fare gates like a regular BART ticket but also offers an unlimited number of local bus rides within the valid half-monthly time period.

[1] Caltrain Ridership Survey, February 2001

Table 3.1-3
Caltrain Rail Service in the Study Area

Station	Typical Headway in Minutes [1]					Weekday Boardings and Alightings
	Weekday			Sat.	Sun.	
	Peak 5-30	Base 30	Eve. 4-25	Base 60	Base 120	
San Francisco County						
Fourth & Townsend						13,609
22nd Street						1,334
Paul Avenue						49
Bayshore						1,021
San Mateo County						
South San Francisco						1,360
San Bruno						1,728
Millbrae						1,801
Broadway						1,117
Burlingame						1,811
San Mateo						2,754
Hayward Park						1,205
Bay Meadows						156
Hillsdale						2,664
Belmont						1,741
San Carlos						2,453
Redwood City						3,607
Atherton						574
Menlo Park						2,623
Santa Clara County						
Palo Alto						4,542
California Avenue						2,766
San Antonio						1,625
Mountain View						4,410
Sunnyvale						2,842
Lawrence						2,610
Santa Clara						2,248
College Park						437
San Jose						3,590
Tamien						1,612
Capitol						229
Blossom Hill						348
Morgan Hill						793
San Martin						435
Gilroy						1,102
Caltrain Total Daily Boardings & Alightings						**71,214**

Sources: Caltrain published schedule, April 29, 2001. Caltrain Ridership Statistics, February 2001.

Recent BART ridership counts from April 2001 show an average weekday ridership of 333,800 passengers. Most passenger activity occurs in downtown San Francisco at the Embarcadero,

Montgomery, Powell, and Civic Center stations (see Table 3.1-4). Weekday boardings at these stations are about 115,055 passengers or about 34 percent of the total weekday boardings. Approximately 50 percent of the daily trips are transbay. Montgomery Station has the highest number of entries and exits with an average weekday activity of 71,466 passengers entering and exiting the station.[2] Table 3.1-4 also shows the percentage of entries at each BART station that are transbay trips.

Table 3.1-4
BART Transbay Service and Ridership

Line/Stations	Weekday Hours of Operation	Typical Headways in Minutes					Weekday Boardings & Alightings	Weekday Transbay Passengers (by Station Origin)	Percent of Station Entries that are Transbay Trips
		Weekday			Sat.	Sun.			
		Peak	Base	Eve.	Base	Base			
Pittsburg/ Bay Point - Colma	4:00 AM - 1:00 AM	5	15	20	20	20			
Pittsburg/Bay Point							9,644	2,615	56%
North Concord							4,175	1,395	65%
Concord							12,409	3,240	51%
Pleasant Hill							13,825	4,769	68%
Walnut Creek							11,972	3,512	61%
Lafayette							6,112	2,024	69%
Orinda							5,168	1,767	71%
Rockridge							9,402	3,221	71%
Fremont-Daly City	5:00 AM - 7:40 PM	15	15	-	20	-			
Fremont (2)							12,463	2,794	45%
Union City (2)							8,144	1,801	45%
South Hayward (2)							6,281	1,364	43%
Hayward (2)							9,858	1,724	36%
Bay Fair (2) (3)							10,362	2,478	47%
San Leandro (2) (3)							10,049	2,521	50%
Coliseum (2) (3)							13,721	2,733	39%
Fruitvale (2) (3)							16,704	3,747	44%
Lake Merritt (2) (3)							9,154	2,340	52%
Richmond – Daly City/Colma	5:00 AM - 7:40 PM	15	15	-	20	-			
Richmond (2)							8,626	1,769	40%
El Cerrito del Norte (2)							16,792	4,134	52%
El Cerrito Plaza (2)							7,820	2,057	52%
North Berkeley (2)							7,331	2,169	60%
Downtown Berkeley (2)							21,216	3,858	36%
Ashby (2)							8,618	2,334	54%
Fremont-Richmond	4:00 AM - 1:00 AM	15	15	20	20	20	See stations marked (2)		

[2] BART Ridership Statistics, April 2001

Table 3.1-4
BART Transbay Service and Ridership

Line/Stations	Weekday Hours of Operation	Typical Headways in Minutes					Weekday Boardings & Alightings	Weekday Transbay Passengers (by Station Origin)	Percent of Station Entries that are Transbay Trips
		Weekday			Sat.	Sun.			
		Peak	Base	Eve.	Base	Base			
Dublin/Pleasanton – Daly City	4:00 AM - 1:00 AM	15	15	20	20	20			
Pleasanton							12,815	4,245	67%
Castro Valley							4,230	1,385	65%
Stations Common to Most Lines									
MacArthur (1) (2)							13,274	3,425	49%
19th Street (1) (2)							16,641	3,558	43%
12th Street (1) (2)							24,816	5,045	41%
West Oakland							10,148	4,252	82%
Embarcadero							69,433	24,544	72%
Montgomery							71,466	22,783	66%
Powell							53,099	13,920	52%
Civic Center							37,541	11,020	58%
16th Street							19,697	2,637	26%
24th Street							24,748	2,570	20%
Glen Park							15,303	1,328	17%
Balboa Park							24,796	1,291	10%
Daly City							16,306	2,125	26%
Colma (1)							14,058	1,345	19%
Total							**668,217**	**165,839**	**50%**

Notes:
(1) Common to Richmond and Pittsburg/Bay Point Lines only
(2) Stations on the Fremont - Richmond Line
(3) Stations on the Pleasanton Line

Sources: BART published schedules, May 2001; Bart Statistics, April 2001

3.1.1.3 Muni Metro

The San Francisco Municipal Railway (Muni) operates the Muni Metro light rail system. For the most part, the system operates in mixed traffic except for the subway sections through central San Francisco and small sections of exclusive at-grade right of way. Muni currently has seven operating lines: J-Church, K-Ingleside, L-Taraval, M-Ocean View, S-Castro, N-Judah, and the F-Market.

All of the lines except the F-Market serve the downtown San Francisco subway stations. The J, K, and M lines also connect with BART at the Balboa Park Station. The J Line also serves the Glen Park Station. Muni's Metro service connects with Caltrain via the N-Judah light rail line, which continues from the Embarcadero Station along a surface extension to the Fourth and Townsend Caltrain Station. The F-Market line consists of historic streetcars running partially in a transit priority lane along the surface of Market Street. Service is provided between Fisherman's Wharf and the Castro Street neighborhood.

Muni Metro lines generally operate between 5:00 a.m. and 1:00 a.m. weekdays, 6:00 a.m. and 1:00 a.m. Saturdays; and 8:00 a.m. and 1:00 a.m. Sundays. Metro Owl service, late-night surface bus service, is offered for portions of various lines. Weekday headways vary between five and 12 minutes depending on the line and time of day. Table 3.1-5 shows the frequencies and ridership of Muni light rail. In 1999, the N-Judah had the highest ridership with 39,000 average weekday boardings.

Table 3.1-5
Muni Rail Services in the Study Area

Line	Typical Weekday Hours of Operation	Typical Headway in Minutes					Average Weekday Route Ridership
		Weekday			Sat.	Sun.	
		Peak	Base	Eve.	Base	Base	
F- Market	5:00 AM – 2:00 AM	5-8	7-8	15	8	8	9,353
S- Castro	Peak AM & PM only	7-12	-	-	-	-	N/A
J- Church	4:00 AM – 2:00 AM	7-10	10	12	12-18	12-20	13,680
K- Ingleside	5:00 AM – 1:00 AM	9	10	15-20	12	15	18,087
L- Taraval	5:00 AM – 1:30 AM	5-10	10	14-20	10	12	28,209
M- Ocean View	4:30 AM – 1:30 AM	9 -12	10	10-15	12	15	28,088
N- Judah	5:00 AM – 1:45 AM	8	10	12	10	12	39,051

Note: The S-Castro began service on April 2, 2001.

Sources: Published Muni Schedules, February 2001; Muni monitoring data, FY 99 - FY 00

3.1.2 EXISTING BUS SERVICES

Muni, SamTrans, AC Transit and Golden Gate Transit provide bus service in the study area. All four operators offer service either within or in the vicinity of the area's major transit hub, the Transbay Terminal at Mission and First Streets. The terminal is also served by paratransit services, Greyhound interregional buses, Gray Line tour buses, and other private tour operations. Caltrain's Fourth and Townsend Station is served by Muni and limited Amtrak bus service only. The ferry terminal at Mission and Embarcadero is served by Golden Gate Transit's ferry feeder bus service. Muni is in the process of abandoning use of the Ferry Terminal's off-street bus turnaround at Mission and Stuart Streets and moving the terminals for 11 Muni lines to the Ferry Terminal's surrounding streets. Caltrain stations in the South Bay have connecting bus service provided by Muni, SamTrans, and the VTA. Table 3.1-1 summarizes the bus connections at the 34 Caltrain stations.

3.1.2.1 Muni Bus Service

Muni currently operates 83 transit lines in regular weekday service. Fifty-six of these are motor coach (diesel bus) and 17 are trolley coach (electric bus). The other 10 lines include seven light rail and three cable car lines. Most bus lines operate seven days a week, between 6:00 a.m. and midnight. Limited late night (owl) service is available between 1:00 a.m. and 5:00 a.m. on sections of 13 Muni routes. On weekdays, service frequencies, or headways, generally range from four to 12 minutes during peak periods, five to 20 minutes during midday, and 10 to 30

minutes during evenings. On weekends, base frequencies generally range from five to 60 minutes, depending on demand and headway policy. In February 2001, Muni began implementing the South of Market Action Plan, a series of service changes that included the partition of the 42-Downtown Loop into the 47-Van Ness and the 10-Townsend, expanded service and frequencies on the 12-Folsom, and extension of the 19-Polk to Townsend Street.

The basic Muni fare for a one-way trip is $1.00. Cash fares include a free transfer given at the time of boarding. Monthly passes are available for travel on all Muni lines as well as BART, SamTrans, and Caltrain service within San Francisco. Seniors, disabled persons, and children under 18 are charged $0.35 for one-way trips and $35.00 for monthly passes. Also available are weekly passes for $9.00 and weekly tourist passes for $33.75, which includes admission to several city visitor attractions.

Muni operates 10 bus lines that directly serve either the Transbay Terminal or its immediate vicinity: the 5-Fulton, 6-Parnassus, 10-Townsend, 14-Mission, 14L-Mission Limited, 14x-Mission Express, 38-Geary, 38L-Geary Limited, 76-Marin Headlands, and the 108-Treasure Island. Five of these routes, including the 5, 6, 38, 38L, and 108, terminate at the terminal. Table 3.1-6 summarizes the service characteristics of the Muni lines that serve the Transbay Terminal, including operating hours, frequencies, number of boardings, and the passenger activity at the Transbay Terminal. Figure 3.1-2 shows the Muni lines within the study area that serve the Transbay Terminal.

Table 3.1-6
Muni Service at the Transbay Terminal

Bus Line	Typical Weekday Hours of Operation	Typical Headways in Minutes					Average Weekday Route Passengers	Estimated Weekday Boardings and Alightings
		Weekday			Sat.	Sun.		
		Peak	Base	Eve.	Base	Base		
5-Fulton	24 Hours	4-9	5-12	15	6-10	9	15,458	1,221
6-Parnassus	5:20 AM - 2:10 AM	7-10	12	20	12	20	6,434	405
10-Townsend	5:30 AM - 1:20 AM	10	12	15	12	12	N/A	N/A
14-Mission	24 Hours	5-10	6	10	7-8	7-8	37,310	1,778
14L-Mission Limited	8:15 AM - 4:45 PM	20	20	-	15	15	6,052	496
14x-Mission Express	6:30 AM - 9:00 AM; 4:00 PM - 6:45 PM	8-9	-	-	-	-	2,572	658
38-Geary	24 Hours	7-8	7-8		14	15	28,779	1,598
38L-Geary limited	6:00 AM - 6:30 PM	7-8	7-8	-	7	-	18,127	1,469
76-Marin Headlands	Daytime Sundays Only	-	-	-	60	60	N/A	N/A
108-MUNI Treasure Island	4:20 AM -1:00 AM	20	20-60	20	45	45	517	529

Notes: Service on the 10-Townsend line began on June 9, 2000. Estimated boardings and alightings on the N-Judah refer only to the peak periods (6 AM - 9 AM and 3:30 PM to 7:00 PM) rather than a full day of service.

Sources: Muni published schedules, February 2001; Muni Monitoring Data, FY 99 – 00.

Figure 3.1-2: Muni Service at the Transbay Terminal

Within the study area, Muni operates 29 routes that do not serve the Transbay Terminal. Their service characteristics are summarized in Table 3.1-7. The routes are mapped in Figure 3.1-3.

Table 3.1-7
Non-Transbay Terminal Muni Service in the Study Area

Bus Line	Typical Weekday Hours of Operation	Typical Headways in Minutes					Estimated Weekday Route Passengers
		Weekday			Sat.	Sun.	
		Peak	Base	Eve.	Base	Base	
1- California	4:40AM – 2:30AM	6-9	5-10	10-17	6-8	6-8	28,793
1-AX California Express	6:45AM – 9:00AM 4:15PM – 6:30PM	10,15	-	-	-	-	-
1-BX California Express	6:45AM – 9:15AM 4:15PM – 6:30PM	5-7, 10	-	-	-	-	-
2- Clement	5:00AM – 8:00PM	10	20	-	15	15	6,865
3- Jackson	6:30AM – 1:30AM	10	20	20	15	15	
4- Sutter	5:00AM – 7:30PM	10	20	-	-	-	
6- Parnassus	5:20AM – 2:10AM	7-10	12	20	12	20	6,434
7- Haight	5:30AM – 7:30PM	10	12	-	12	20	5,620
9- San Bruno	5:00AM – 1:40PM	6-9	10	15	10	10	18,461
9x- San Bruno Express	7:00AM – 7:30PM	7-12	12	-	-	-	8,416
12-Folsom	5:30 AM – 1:30AM	7-10	10	20	10	10	3,829
15- Third	4:45AM – 1:30AM	5-10	10	15	10	10	27,735
21- Hayes	5:15AM – 1:45AM	5-8	6-10	20	12	12	9,740
30- Stockton	5:00AM – 2:00AM	4-5	5-10	8-10	6	5-10	26,428
30x- Marina Express	6:00AM – 9:45AM 3:45PM – 7:00PM	5-7	-	-	-	-	2,467
31- Balboa	4:45AM – 2:00AM	10	10-12	15	15	15	10,149
31AX- Balboa Express	6:45AM – 8:45AM 4:15PM – 6:30PM	8-9,10	-	-	-	-	
31BX- Balboa Express	6:45AM – 9:00AM 4:15PM – 6:30PM	10	-	-	-	-	
38AX- Geary Express	7:00AM – 9:00AM 4:00PM – 7:30PM	10,15	-	-	-	-	
38BX- Geary Express	6:45AM – 9:00AM 4:15PM – 7:30PM	7-9, 10-12	-	-	-	-	
41- Union	5:00AM – 9:30AM 3:30PM – 7:45PM	10	-	-	-	-	3,560
45- Union/Stockton	5:30AM – 2:00AM	6-9	6	15-17	12	15	19,344
66- Quintara	5:45AM – 12:00AM	20	20	30	30	30	1,188
71- Haight - Noriega	5:45AM – 1:15AM	10	12	15-20	12	10	10,195
80x- Gateway Express	7:00AM – 9:30AM 3:30PM – 6:15PM	6-10	-	-	-	-	526
81x- Caltrain Express	6:15AM – 9:30AM 3:35PM – 6:00PM	5-30	-	-	-	-	718
82x- Levi Express	6:15AM – 9:15AM 3:30PM – 6:40PM	20-30	-	-	-	-	711
91- Owl	12:15AM – 6:15AM	30	-	-	-	-	365

Sources: Muni Published Schedules, February 2001; Muni Monitoring Data, FY 99-00.

Figure 3.1-3: Non-Transbay Terminal Muni Service in the Study Area

Muni operates nine bus lines that serve the Fourth and Townsend Caltrain Station: the 10-Townsend, 15-Third, 30-Stockton, 38L-Geary Limited, 47-Van Ness, 45-Union/Stockton, 80x-Caltrain Express, 81x-Caltrain Express, 82x-Presidio & Wharves Express. The N-Judah light rail line also serves the station. Figure 3.1-4 shows the routes of Muni lines within the study area that serve the Caltrain Station. Table 3.1-8 summarizes their service characteristics.

Table 3.1-8
Muni Service at the Fourth and Townsend Caltrain Station

Bus Line	Typical Weekday Hours of Operation	Typical Headways in Minutes					Average Wkd	Estimated Wkd
		Weekday			Sat.	Sun.		
		Peak	Base	Eve.	Base	Base		
10-Townsend	5:30 AM – 1:20 AM	10	12	15	12	12	N/A	N/A
15-Third Street	4:45 AM – 1:30 AM	5-10	10	15	10	10	27,735	1,623
30-Stockton	5:00 AM – 2:00 AM	4-5	5-10	8-10	6	5-10	26,428	3,071
45-Union/Stockton	5:30 AM – 2:00 AM	6-9	6	15-17	12	15	19,344	2,252
47- Van Ness		6-7	7-8	12-15	7-8	7-8	N/A	N/A
76 - Marin Headlands	Daytime Sundays Only	-	-	-	60	60	N/A	N/A
80x- Caltrain Express	7:00 AM – 9:30 AM; 3:30 PM – 6:15 PM	6-10	-	-	-	-	526	756
81x- Caltrain Express	6:15 AM – 9:30 AM; 3:35 PM – 6:00 PM	5-30	-	-	-	-	718	843
82x- Presidio & Wharves Express	6:15 AM –9:15 AM; 3:30 PM – 6:40 PM	20-30	-	-	-	-	711	477
N-Judah Light Rail	5:00 AM – 1:45 AM	8	10	12	10	12	39,051	3,455

Notes: Service on the 10-Townsend and 47-Van Ness lines began on June 9, 2000; estimated boardings and alightings on the N-Judah refer only to the peak periods (6 AM -9 AM and 3:30 PM to 7:00 PM) rather than a full day of service.

Sources: Muni published schedules, February 2001; Muni Monitoring Data, FY 99-00.

3.1.2.2 AC Transit

AC Transit provides local, express, and commuter service in western Alameda County and western Contra Costa County. Of AC Transit's 138 routes, 35 offer transbay service between the East Bay and the Transbay Terminal, the operator's only San Francisco stop. Midday storage of AC Transit occurs on the Transbay Terminal bus ramps, which can provide storage for up to 120 standard 40-foot buses.

Of the 35 transbay routes, five are 'basic service' that operate seven days a week throughout the day and 31 are 'commuter service' that operate peak periods only. On weekdays, headways for peak period service vary between seven and 30 minutes. Most commute trips are offered in the peak direction only with westbound service provided in the morning and eastbound service in the evening. Figure 3-1 shows the route that AC Transit buses take to serve the Transbay Terminal. Table 3.1-9 summarizes the service characteristics of the basic and commuter services.

Approximately 15,205 daily weekday passengers use AC Transit's transbay service. The line with the highest ridership is the O-Alameda with 1,780 daily boardings.[3]

[3] AC Transit Passenger Counts, February 2001.

Figure 3.1-4: Muni Service at the Caltrain Station

Table 3.1-9
AC Transit Service at the Transbay Terminal

Bus Line	Typical Weekday Hours of Operation	Typical Headway in Minutes					Weekday Transbay Ridership
		Weekday			Sat.	Sun.	
		Peak	Base	Eve.	Base	Base	
Basic Transbay Service							
F - Berkeley	4:45 AM - 12:45 AM	15 - 30	30	30	30	30	817
N - San Leandro	4:40 AM - 9:07 AM; 7:10 PM - 12:52 AM	30	-	10-30	30	30	711
NL - San Leandro	6:10 AM - 8:07 PM	20-30	30	30	30	30	991
O - Alameda	5:27 AM - 12:41 PM	7-20	45	60	60	60	1778
A - Oakland Airport	24 Hours	30	30	30	30	30	314
Commute Hour Only Transbay Service			**AM Peak Trips**		**PM Peak Trips**		
			Westbound	Eastbound	Westbound	Eastbound	
B - Trestle Glen			4	0	5	0	157
BX - Trestle Glen			4	0	2	3	55
C - Piedmont			10	4	10	14	461
CB - Montclair			4	0	0	4	191
E - Claremont			8	0	0	10	321
FS – Berkeley			5	0	0	5	236
G - El Cerrito			10	0	0	9	518
H/HX - El Cerrito			10	0	0	10	526
K - San Leandro			5	0	0	6	185
KH - San Leandro			5	0	0	5	131
L - El Sobrante			9	0	0	12	476
LA - El Sobrante			13	8	7	13	760
LB - El Sobrante			7	0	7	13	425
LC - El Sobrante			7	0	0	10	445
LD (LX) - Richmond			5	2	0	5	255
NF - San Leandro			6	0	0	11	445
NG - San Leandro			5	0	0	11	525
NH - San Leandro			6	1	1	11	359
NV - San Leandro			2	0	0	4	103
OX/OX1 -0 Alameda			11	0	0	14	813
P (CH) - Piedmont			7	0	0	16	712
RCV/RCVX - Castro Valley			7	0	0	7	231
S - Hayward			5	0	0	4	226
SA (SW) - Hayward			4	0	0	6	244
SB - Newark			5	0	0	6	285
V - Montclair			7	0	0	17	703
W (W1) - Alameda			9	0	0	10	504
WA (W2) - Alameda			3	0	0	3	104
Y - Emeryville			2	0	0	2	56
Z - Albany			0	8	7	0	142
Total							**15,205**

Sources: AC Transit published schedules, March 2001; AC Transit passenger counts, February 2001.

Most AC Transit Transbay trips cost $2.50 for a one-way ticket, $22.00 for a 10-ride ticket book and $80.00 for a monthly pass. Longer distance transbay trips are priced at $2.75 for a one-way ticket, $25.00 for a 10-ride ticket book and $90.00 monthly pass. Service between the Transbay Terminal and Oakland airport costs $5.00. Seniors, disabled persons, and children under 12 are eligible for 50 percent discounts on all types of tickets except the monthly passes.

3.1.2.3 SamTrans

SamTrans provides connections to the Daly City and Colma BART stations, the San Francisco International Airport, and downtown San Francisco. In August 1999, SamTrans reorganized its local and commuter service into a core system with reallocated service from areas of little demand to areas of greater demand. Table 3.1-10 summarizes the SamTrans service between the Transbay Terminal and communities along the Peninsula. Nine lines provide commute service between San Mateo County and the Transbay Terminal. Seven of these lines operate only during peak periods. Figure 3.1-5 shows SamTrans routes that serve the Transbay Terminal.

Table 3.1-10
SamTrans Bus Service in the Transbay Terminal Area

Bus Line	Typical Weekday Hours of Operation	Typical Headway in Minutes					Weekly Afternoon Peak Period Ridership out of San Francisco
		Weekday			Sat.	Sun.	
		Peak	Base	Eve.	Base	Base	
DX Pacifica-San Francisco	AM & PM Peak Only	10-15					172
KX Palo Alto-San Francisco	5:15 AM - 1:45 AM	25-40	25-40	60	30	30	296
MX San Mateo - San Francisco	AM & PM Peak Only	20-30					88
NX Redwood Shores-San Francisco	AM & PM Peak Only	30					48
PX Redwood City-San Francisco	AM & PM Peak Only	10-30					72
RX Palo Alto-San Francisco	AM & PM Peak Only	15-40					32
TX San Carlos-San Francisco	AM & PM Peak Only	20					64
391 San Mateo-Daly City-San Francisco	AM & PM Peak Only	20	-				432
292 San Francisco - Hillsdale S.C.	4:45 AM - 2:15 AM	20-40	25-35	60	30	30	464

Note: Ridership figures refer to the number of southbound SamTrans passengers leaving San Francisco during the afternoon peak period of 4 PM - 7PM. SamTrans does not currently have data available describing the daily patronage specifically at the Transbay Terminal.

One-way cash fares for travel between San Francisco and the South Bay are $2.20 for regular intercity service and $3.00 for express service. Seniors and disabled persons pay $0.50 for regular service and $1.25 for express service during non-peak periods. Youth, between six and 17, pay $1.50 for regular service and $1.25 for express service.

Tokens are sold in packages of 10 at a 10 percent savings over cash fares. Monthly passes cost $56.00 for regular service and $102.00 for express service. Seniors and disabled persons are charged $18.00 for regular service passes. Children under 17 pay $22.00 for regular service passes. SamTrans passengers may also purchase a Muni sticker, which upgrades their monthly passes to include unlimited rides on Muni. Stickers cost $17.00 when purchased with a regular service pass and $11.00 with an express pass.

Figure 3.1-5: SamTrans Routes Serving the Project Area

3.1.2.4 Golden Gate Transit

Operated by the Golden Gate Bridge, Highway, and Transportation District, Golden Gate Transit provides daily bus service to Marin and Sonoma counties with connections to San Francisco and the El Cerrito Del Norte BART Station in Contra Costa County. Within San Francisco, the major transfer and boarding points are the San Francisco Transbay Terminal, Seventh and Market Streets near the Civic Center, and the Golden Gate Bridge Toll Plaza. Golden Gate Ferry provides daily ferry service between Larkspur or Sausalito in Marin County and San Francisco. Midday storage for Golden Gate Transit buses occurs at an off-site location at Main and Howard Streets. The storage area supports 125 buses.

Golden Gate Transit offers 28 transbay routes between Marin County and the Transbay Terminal. Seven of these are 'basic routes' that operate throughout the day. Basic routes operate on weekdays except for Line 10, which operates only on weekends. Most of Golden Gate Transit's basis service lines are routed along Mission and Van Ness Streets to serve the Civic Center. The other 21 transbay routes provide commuter service only during weekday peak periods. Frequencies during peak periods for both basic and commuter routes vary between five and 60 minutes. Most of the commuter service routes travel along Battery and Sansome Streets to serve the Financial District. Frequencies during peak periods for both basic and commuter routes vary between five and 60 minutes. Figure 3.1-6 shows Golden Gate Transit routes that serve the Transbay Terminal area and Table 3.1-11 summarizes Golden Gate's service in the Terminal area.

The Golden Gate service area is divided into ten fare zones. Transbay adult cash fares for one-way bus travel range from $2.50 to $5.00. Ferry service between San Francisco and Larkspur costs $3.10 on weekdays and $2.65 on weekends or holidays. Ferry service between San Francisco and Sausalito costs $5.30 regardless of the day of travel. Seniors and disabled persons are eligible for a 50 percent discount on bus and ferry tickets. Children receive a 25 percent discount. Inter-county passes containing 20 tickets are discounted 20 percent from face value. Two Golden Gate Transit routes, Line 67 and Line 69, offer free shuttle service between the Ferry Terminal and San Francisco's financial district, South of Market area, and the Civic Center.

Current ridership data are not available for Golden Gate Transit. In March 1997, Golden Gate estimated the number of southbound passengers as 3,684 during the morning peak (7:30 a.m. - 8:30 a.m.) and 18 during the evening peak (4:30 p.m. - 5:30 p.m.). Northbound passengers were estimated at 375 during the morning peak and 3,207 during the evening peak.

Figure 3.1-6: Golden Gate Transit Service at the Transbay Terminal

Table 3.1-11
Golden Gate Transit Service at the Transbay Terminal Area

Bus Routes	Typical Weekday Hours of Operation	Typical Headways in Minutes				
		Weekday			Sat.	Sun.
		Peak	Base	Eve.	Base	Base
Basic Routes						
10 Tiburon-Mill Valley-Sausalito (1)	Weekends Only	-	-	-	60	60
20 Canal-San Anselmo-Corte Madera	4:30 AM - 2:00 AM	30	30	60	-	-
30 San Rafael-Larkspur Ferry	8:15 AM - 5:00 AM	60	60	60	-	-
50 San Marin-Novato-San Rafael-Sausalito	4:00 AM - 1:00 AM	30	30	60	60	60
60 San Rafael	(2)	(2)	(2)	(2)	(2)	(2)
70 Novato-San Rafael	(2)	(2)	(2)	(2)	(2)	(2)
80 Santa Rosa-Novato-San Rafael	24 Hours	20 - 30	30	30 - 60	30	30
Commute Routes (Operate Peak Times Only)						
2 Marin Headlands-Marin City		10-20				
4 Mill Valley		7-10				
8 Tiburon		15 - 30				
18 San Anselmo-College Of Marin-Corte Madera		30 - 60				
24 Lagunitas-Manor-San Anselmo-Greenbrae		5-10				
26 Sleepy Hollow-San Rafael		15-20				
28 San Rafael-Canal-Larkspur Landing		30				
32 Peacock Gap-San Rafael		30 -60				
34 Santa Venetia-San Rafael		30 - 45				
38 Terra Linda		10-15				
44 Lucas Valley		15-30				
48 Novato-Ignacio		30				
54 San Marin-Novato Blvd.		5-15				
56 San Marin		10-15				
72 Santa Rosa-Rohnert Park Expressway		(3)				
74 Santa Rosa-Petaluma		15-30				
76 Rohnert Park-East Petaluma		30				
78 Santa Rosa-Sebastopol		25-50				
90 Sonoma Valley-San Rafael		(3)				
93 Golden Gate Bridge-S.F. Civic Center		10-15				

Notes:
(1) Transbay Service on weekends Only.
(2) Routes 60 and 70 are part of Route 80 Service. Hours of operational weekdays are combined for 60, 70, and 80 service from San Francisco.
(3) Only one southbound and one northbound run serve the Transbay Terminal area.
Source: Golden Gate Transit published schedules, June 2001.

3.1.3 OTHER SERVICES

3.1.3.1 Caltrans Bay Bridge Bicycle Shuttle

Caltrans operates the Bay Bridge Bike Shuttle, which runs during peak commute periods when bikes may not be carried across the Bay on BART. Service is provided between the Transbay Terminal in San Francisco, Treasure Island, and the MacArthur BART station. Four westbound and three eastbound shuttles are provided during both morning and evening peak periods. The service costs $1.00.

3.1.3.2 Regional Paratransit

There are several paratransit operations serving the study area including the Napa Valley Commute Club and the Valley of the Moon Commute Club. The Napa Valley Commute Club is a non-profit organization that offers commuters peak direction morning and evening service between Napa Valley and San Francisco. The morning service boards passengers at three locations in the City of Napa and drops them off at 15 stops in San Francisco including Fremont Street between Mission and Howard Streets. Evening service boards passengers at the Transbay Terminal's street level crescent loading area on Mission Street. Approximately 50 passengers ride the service's single coach bus during both morning and evening service. Membership is $170 per calendar month. For infrequent riders, the cost is $8.00 one-way or $13.00 round-trip.[4]

Valley of the Moon Commute Club is a member run club, which carries North Bay commuters between Sonoma Valley and San Francisco. In San Francisco, stops are made along Mission Street at First, Jessie, Fourth, and Sixth Streets. Monthly subscriptions are $135.

3.1.3.3 Greyhound

Greyhound Lines is an interregional, private bus operation carrying passengers and package freight. At the Transbay Terminal, there are 43 daily outbound schedules during the off-peak season and 49 daily schedules during the peak season (June through August). Greyhound does not serve the Caltrain Fourth and Townsend Station. The most popular destinations are Sacramento, Reno, Los Angeles, San Jose, and Santa Cruz. During weekends and holidays, Greyhound adds additional service. In May 2001, six roundtrip runs of commuter service were added between the Transbay Terminal and Sacramento. In 2000, Greyhound counted a total of 263,040 outbound passengers at the Transbay Terminal.

3.1.3.4 Amtrak

Amtrak does not offer rail service in San Francisco but offers connecting bus service between downtown San Francisco and Amtrak's Emeryville Station. Within the study area, bus stops are located at the Caltrain Fourth and Townsend Station, the Moscone Center on Howard Street at Fourth, the Hyatt Regency on Market and Davis, and the Ferry Building.

[4] Interview with Napa Valley Commute Club Representative, Bob Streich, June 4, 2001

The thruway bus service connects passengers with Amtrak's Capital Corridor, Coast Starlight, California Zephyr, and San Joaquin routes.

3.1.3.5 Private Tour Operators

Grayline Tours is the largest private tour operator at the Transbay Terminal. The company offers day trips around the city and to regional tourist destinations including Muir Woods, Napa and Sonoma Valleys, Monterey Bay, and Yosemite National Park. Tour buses for day trips board passengers at five bus bays on the bus deck level. During the peak summer season, a maximum of 40 buses board and alight at the Transbay Terminal. During the winter, a minimum of 25 daily buses uses the Terminal. In 2000, passenger counts varied from 2000 daily passengers in the summer to 200 to 300 during the winter.[5]

Other tour operators offer a smaller scale of service from the Transbay Terminal. During the peak summer season, Silverstar Tours operates about 13 daily trips to Reno, Lake Tahoe, Monterey, and Napa Valley. Approximately 150 daily passengers board on First Street, just west of the Transbay Terminal. Green Tortoise Adventure runs between three and four weekly tours throughout the West Coast. Passengers board during weekday evenings from Natoma Street between First and Fremont.

3.1.4 EXISTING TRANSIT SERVICE UTILIZATION VERSUS CAPACITY

Transit has become increasingly important as a travel mode for persons going to and from downtown San Francisco because of constrained roadway capacity. The current utilization and potential capacity of the various transit modes providing access to the city were analyzed to establish available transit capacity. The analysis period was the evening peak commute hours of 4:00 to 6:00 p.m., the busiest part of the typical workday. For persons beginning and ending their trips in San Francisco, four surface and subway corridors within the city were identified that included the major bus and rail lines providing local transit service. These corridors are in the vicinity of the downtown; services are operated primarily by either Muni or BART (San Francisco-Daly City Colma trains).

For persons traveling through the study area with a trip origin or destination outside of San Francisco, three regional corridors were identified. The major transit operators in the regional corridors are Caltrain, BART, AC Transit, SamTrans, Golden Gate Transit (bus and ferry), and the various ferry services to the East Bay and North Bay.

For all transit routes in these local and regional corridors, the number of evening riders outbound from San Francisco was estimated at the maximum load point (i.e., the point of highest demand) from available data sources and aggregated to obtain a total demand for each transit line and travel corridor. This is referred to as a demand screenline analysis. As a counterpart to the demand in a corridor, the service capacity of each transit route was also estimated, by

[5] Interview with Grayline representative, June 4, 2001.

multiplying the passenger capacity standard for transit vehicles by the number of transit trips scheduled during the evening peak. The ridership demand was compared to the capacity provided and expressed as a percent utilization of available capacity. Demand/capacity utilizations were also calculated for each corridor and the local and regional screenlines combined.

Tables 3.1-12 and 3.1-13 provide a summary of this analysis. As shown, the estimated current utilization of local transit capacity is around 70 percent. The estimated current utilization of regional transit capacity provided from San Francisco in the evening peak is approximately 72 percent.

Table 3.1-12
Existing Outbound PM Peak Period Transit Demand and Transit Capacity
San Francisco Screenline Corridor

Screenline	Transit Line (1)	Ridership (2)	Existing Capacity	Capacity Utilization
Northeast				
Kearny/Stockton	Muni 30, 30X, 45	3,695	5,222	71%
All other lines	Muni 32, 41, 422, 82X	1,576	3,413	46%
TOTAL NORTHEAST		**5,271**	**8,635**	**61%**
Northwest				
Geary Corridor	Muni 38, 38L, 38AX, 38BX	4,181	5,885	71%
All other lines	Muni 1, 1AX, 2, 3, 4, 5, 21, 31, 31AX, and 31BX	9,927	13,979	71%
TOTAL NORTHWEST		**14,108**	**19,863**	**71%**
Southwest				
Subway Lines	Muni Metro K, L, M, and N	8,764	11,781	74%
All other lines	Muni 6, 7, 66, 71L, F	2,348	3,661	64%
TOTAL SOUTHWEST		**11,112**	**15,442**	**72%**
Southeast				
Mission Street Corridor	Muni 14, 14L and 14X	1,946	2,650	73%
Third Street Corridor	Muni 15	707	1,191	59%
All other lines	Muni 14, 14L and 14X	3,304	4,339	76%
TOTAL SOUTHEAST		**5,958**	**8,180**	**73%**
TOTAL SAN FRANCISCO SCREENLINES		**36,449**	**52,120**	**70%**

Notes:
(1) Lines reaching maximum load point going outbound towards screenline.
(2) Ridership refers to outbound passenger loads at the maximum load point between 4PM and 6PM.

Sources: San Francisco County Transportation Authority, Wilbur Smith Associates, 2001

In contrast to other transit operators, Muni has established a capacity utilization service standard of 1.0 which includes not only seating capacity but also substantial numbers of standees, with standees representing somewhere between 30 to 80 percent of seated passengers, depending upon the specific transit vehicle configuration. Thus, Muni screenlines and sub-corridors at or near 100 percent of capacity operate under noticeably crowded conditions with many standees. Because each screenline and most sub-corridors include several Muni lines with multiple transit vehicles from each line, some individual transit vehicles operate at or above 100 percent of capacity and are extremely crowded during the PM peak hour at their most heavily used points

(i.e., screenlines), while others operate under less crowded conditions. Moreover, the extent of crowding is accentuated whenever target headways are not met through either missed runs and/or bunching in service. Thus, in common with other types of transportation operations such as roadways and parking facilities, transit operators may experience substantial problems in service delivery well short of established service capacity standards.

Table 3.1-13
Existing Outbound PM Peak Period
Transit Demand & Capacity – Regional Screenlines

Regional Transit Screenline	Ridership	Existing Capacity	Capacity Utilization
East Bay:			
AC Transit	3,143	4,896	64%
BART	17,537	14,560	120%
Ferry	646	1,629	40%
TOTAL EAST BAY	21,326	21,085	101%
North Bay:			
GGT Bus	3,132	5,339	59%
GGT Ferry	755	2,410	31%
TOTAL NORTH BAY	3,886	7,749	50%
South Bay:			
SamTrans	785	1,083	72%
BART	3,157	10,360	30%
Caltrain	1,900	2,900	66%
TOTAL SOUTH BAY	5,842	14,343	41%
GRAND TOTAL	**31,054**	**43,177**	**72%**

Notes: Ridership and capacity for outbound trips (away from downtown San Francisco) for the weekday PM Peak hour (typically 5:00 – 6:00 PM) based on information obtained from each of the regional transit carriers.

Sources: BART, AC Transit, Golden Gate Transit, SamTrans, Wilbur Smith Associates, July 2001

3.1.5 FUTURE RAIL TRANSIT AND BUS SERVICE

This section outlines the future year improvements to rail and bus transit services in the study area.

3.1.5.1 Caltrain Service Improvements

The JPB has programmed substantial service increases to over 114 daily trains in the San Francisco to San Jose segment and over 20 daily trains in the San Jose to Gilroy segment within the next 10 years. For a comprehensive description of Caltrain's planned operations and capital improvements, see Section 2.1, No-Project Alternative.

3.1.5.2 BART Extension to San Francisco International Airport

The BART – San Francisco International Airport (SFO) Extension will extend BART service from its current southern terminus at the Colma Station to SFO. The extension will continue south from SFO to a new Millbrae intermodal station, which will enable transfers between BART and Caltrain. Construction is ongoing and scheduled for completion in 2002. For additional information about the SFO extension, see Section 1.4.1, BART Extension to San Francisco International Airport, and 1.4.2, Millbrae Intermodal Station.

3.1.5.3 Muni Third Street Light Rail

A new light rail service in San Francisco's Bayshore corridor will be extended from the terminus of Muni's existing service at Fourth and King Streets. The line will cross the Fourth Street Bridge and run along Third Street and Bayshore Boulevard, ending at the Bayshore Caltrain Station in Visitation Valley. The 5.4 miles of new rail will be constructed primarily in the center of the street to improve safety and reliability. Nineteen stops will be provided. Bus service changes connected with the Third Street light rail line include elimination of the 15-Third, extensions of the 9,9X, 9AX, 9BX, 36 and 43 lines to cover portions of the 15-Third not covered by the new light rail and rerouting of the 54 Felton.

3.1.5.4 Muni Central Subway

Muni and the City and County of San Francisco are actively pursuing funding for construction of the Central Subway. The proposed light rail service will be extended north from the Third Street Light Rail Service at King Street along Third Street, entering a new Central Subway near Bryant Street, crossing beneath Market Street and running under Geary and Stockton Streets to Stockton and Clay Streets. A total of four underground subway stations will be built at Moscone Center, Market Street, Union Square, and Clay Street in Chinatown. A surface station will be built at Third and King.

3.1.5.5 Other Muni Service Changes

In February 2001, Muni began implementing the South of Market Action Plan, a series of service changes including the partition of the 42-Downtown Loop into the 47-Van Ness and the 10-Townsend, expanded service and frequencies on the 12-Folsom, and extension of the 19-Polk to Townsend Street. In April 2001, a new light rail service, the S-Castro began peak period service on Market Street between the downtown and Castro stations. Also to be implemented is additional service on the 9-San Bruno line between the vicinity of San Francisco General Hospital and the Ferry Terminal on weekdays. For a summary of recent and planned changes, see Table 2.1-1.

3.1.5.6 SamTrans

SamTrans is planning to modify, eliminate, or consolidate certain express bus routes. SamTrans' 1999 Strategic Plan states that termination of express bus service may occur in response to BART extensions, increased service on Caltrain and greater congestion on Highway 101.

3.1.6 PROJECTED CALTRAIN PATRONAGE AND ACCESSIBILITY IMPROVEMENTS

This section outlines future Caltrain patronage forecasts and transit travel times with and without the Caltrain Extension project. Caltrain's current and projected daily boardings and alightings by station for 2001 and 2020 are shown in Table 3.1-14. The 2001 data are for February 2001.[6]

3.1.6.1 Caltrain Ridership Under No-Project Alternative

As shown in Table 3.1-14, Year 2020 ridership at the Fourth and Townsend Station is projected to be less than in 2001 because of expected transfers to and from BART at the new Millbrae intermodal station. But Caltrain ridership is expected to grow by 140 percent system wide. For the No-Project Alternative under a 170-train Caltrain weekday schedule, the system is projected to carry approximately 50,000 riders. This ridership level is substantially higher than the current level of 35,600 riders.

3.1.6.2 Caltrain Ridership Under Caltrain Downtown Extension Alternative

Table 3.1-14 also shows Caltrain projected daily boardings and alightings by station for the year 2020 with the proposed Caltrain Downtown Extension which would extend Caltrain to the Transbay Terminal site. For a 170-train weekday schedule, ridership is projected to increase to 64,000 trips per day, an increase of 13,900 trips over the projected 2020 No-Project ridership, and of 80 percent over the February 2001 ridership of 35,600 trips per day. Ridership at the San Francisco terminal is likewise projected to increase, from 13,000 to 29,300 daily boardings and alightings if the terminal station were moved from Fourth and Townsend Streets to the Transbay Terminal site. An additional 3,100 daily boardings and alightings are projected for a Fourth and Townsend/Mission Bay Station, which would be located in the vicinity of the existing Caltrain terminal. Incremental increases in ridership are projected for all other Caltrain stations except those south of the Tamien Station in San Jose.

3.1.6.3 Projected Travel Times/Accessibility With and Without the Caltrain Downtown Extension

Table 3.1-15 shows travel time comparisons on Caltrain for selected trips between central origins and destinations in the cited cities.[7] These travel time estimates are taken directly from the patronage model, where they are used to determine ridership levels. The travel times include

[6] Caltrain On-Board Survey, February 2001.

[7] Including transfers to other service providers as appropriate for the respective trip ends.

access, wait, transfer, and ride times at both ends of the trip for four selected origins and destinations for the year 2001 and projected for the year 2020. The travel time savings under the No-Project scenario can be attributed to Caltrain Rapid Rail Program improvements currently underway along the Caltrain railroad, such as track rehabilitation and other infrastructure improvement, electrification, and the increase in the number of weekday trains from 78 to 170.

Table 3.1-14
Caltrain Daily Boardings and Alightings
Existing, 2020 No Project, and with Downtown Extension

Station	2001	2020 No-Project	2020 Extension to Transbay Terminal
Transbay Terminal	0	0	29,307
Fourth & Townsend	13,611	12,950	3,098
22nd Street	1,334	1,716	1,706
Paul Avenue	49	49	51
Bayshore	1,021	1,366	1,427
South San Francisco	1,360	1,879	2,173
San Bruno	1,728	2,334	2,657
Millbrae	1,801	8,370	5,948
Broadway	1,117	1,524	1,841
Burlingame	1,811	2,448	3,035
San Mateo	2,754	3,652	4,645
Hayward Park	1,205	1,627	1,938
Hillsdale	2,820	4,126	5,791
Belmont	1,741	2,348	2,933
San Carlos	2,453	3,408	4,011
Redwood City	3,607	4,835	5,730
Atherton	574	800	904
Menlo Park	2,623	3,861	4,439
Palo Alto	4,560	6,217	7,311
California Avenue	2,766	3,604	4,048
San Antonio	1,598	2,217	2,539
Mountain View	4,428	6,697	7,375
Sunnyvale	2,842	4,067	4,439
Lawrence	2,610	3,857	4,096
Santa Clara	2,248	3,258	3,368
College Park	437	532	547
San Jose	3,590	5,534	5,686
Tamien	1,612	2,206	2,237
Capital	228	308	311
Blossom Hill	348	547	551
Morgan Hill	793	1,258	1,259
San Martin	435	570	570
Gilroy	1,102	1,948	1,949
Total Entries + Exits	71,206	100,115	127,921
System Entries	35,603	50,057	63,960

Source: Caltrain February 2001 Ridership Survey; Parsons Transportation Group Ridership Forecast, August 2001

Table 3.1-15
Estimated Transit Travel Times for Selected Trips on Caltrain*

Origin	Destination	Travel Time (hour: min)			Projected Travel Time Savings (minutes)
		2001	2020 No-Project	2020 Extension to Transbay Terminal	
Downtown San Jose	Downtown San Francisco	2:05	1:39	1:24	15
Sunnyvale	Downtown San Francisco	1:51	1:40	1:26	14
Palo Alto	Downtown San Francisco	1:36	1:17	1:02	15
Millbrae	Downtown San Francisco	1:08	0:52	0:37	15
San Bruno	Downtown San Francisco	1:04	0:54	0:40	14
Downtown San Francisco	San Francisco Airport	1:11	0:56	0:47	10
Redwood City	Concord	2:26	2:13	1:59	14
Downtown Oakland	San Carlos	1:41	1:28	1:15	13

Notes: *The travel times are for average peak-direction conditions and include access, wait, transfer, and ride times at both ends of the trips between central origins and destinations in the cited cities.

Source: Parsons Transportation Group Ridership Model, September 2001.

With the Caltrain Downtown Extension, travel time savings for selected trips are projected to be 13 to 15 minutes compared to No-Project conditions, except for trips beginning in the San Francisco Airport, for which the time savings are projected to be 10 minutes.

3.2 VEHICULAR TRAFFIC

This section describes the regional roadways and local streets in the project area and traffic conditions on those facilities.

3.2.1 REGIONAL ROADWAYS IN CORRIDOR

The study area is served by three freeways -- Interstate 80, Interstate 280, and U.S. Highway 101. These are all limited-access, divided facilities and are described further below.

3.2.1.1 Interstate 80 (I-80)

I-80 is oriented east-west across the country from San Francisco to New York City. The San Francisco - Oakland Bay Bridge is part of the I-80 system, connecting San Francisco to the East Bay. The Bay Bridge has five lanes eastbound and five lanes westbound. The portion of I-80 between U.S. 101 and the Bay Bridge that crosses the project area exists as an eight-lane facility. Existing daily traffic volumes in this segment range from 218,000 vehicles to 232,000 vehicles. The Bay Bridge carries approximately 290,000 vehicles per day. During the peak hour, Caltrans

estimates I-80 carries nearly 20,000 vehicles in the segment between U.S. 101 and the Bay Bridge.

3.2.1.2 Interstate 280 (I-280)

I-280 passes near the western end of the study area, serving South San Francisco and western Peninsula cities. The freeway runs north-south and extends from San Francisco southward to San Jose. I-280 and U.S. 101 cross south of downtown San Francisco. Just south of where U.S. 101 crosses, daily traffic volumes on I-280 are 164,000 vehicles per day, with daily volumes of 230,000 vehicles per day at the Pacifica exit. Ramp connections to I-280 from King Street provide direct connections to The Embarcadero adjacent to the existing Caltrain Terminal at Fourth and King Streets.

3.2.1.3 U.S. Highway 101 (U.S. 101)

U.S. 101 passes south and west of the study area, serving San Francisco, the Peninsula, and San Jose. It extends north to the Golden Gate Bridge, Marin County and beyond to the Seattle area, and south through the state to Los Angeles. It is primarily an eight-lane facility south of I-80 and along the Peninsula. From the southern San Francisco city limits to I-80, the average daily traffic ranges from 245,000 to 255,000 vehicles, with the highest volumes near the I-80 junction. In San Mateo County, the average daily traffic volumes range from 181,000 to 275,000 vehicles, with the highest volumes near the interchange with State Route 92 and in the vicinity of the San Francisco International Airport.

In Santa Clara County, U.S. 101 average daily traffic volumes are highest near San Jose (reaching about 248,000 vehicles) and around Mountain View near State Route 85 (about 246,000 vehicles). The traffic volumes are lowest in the southern part of Santa Clara County, with average daily volumes around 83,000 vehicles in Gilroy.

3.2.1.4 El Camino Real

In addition to the three freeways described above, State Route 82 (El Camino Real) runs north-south in the Caltrain corridor, serving the Peninsula cities. El Camino Real is the only continuous arterial street serving the entire length of the Peninsula, and carries up to 3,000 vehicles during the peak hour in some segments near the Caltrain stations in Millbrae and San Bruno. Many of the Caltrain stations have access to El Camino Real or a nearby parallel road.

3.2.2 THE STREET NETWORK IN THE PROJECT AREA

The boundaries of the traffic study area are Market Street to the north, Third Street to the west, Bryant Street to the south, and the San Francisco Bay to the east. This area is the primary focus of the traffic evaluation for the Terminal / Extension / Redevelopment project.

The study area has a well-developed street system between Market and Bryant Streets. Streets are primarily one-way, and block lengths are usually between 425 to 900 feet in the east-west direction and 300 to 600 feet in the north-south direction. According to the Transportation Element of the San Francisco General Plan, the primary northbound and southbound arteries are Main, Beale, Third, Fourth, Fifth, and Sixth Streets. Main and Third Streets provide one-way northbound traffic, and Beale and Fourth Streets provide one-way southbound traffic. Fifth and Sixth Streets are used for two-way traffic.

Primary east-west arteries include Howard, Folsom, Harrison, and Bryant Streets, and a portion of King Street. Folsom Street is currently a four-lane eastbound street except from The Embarcadero to Main Street, where it becomes a two-way street, with three lanes eastbound and one lane westbound. Bryant Street is also one-way eastbound, except for the portion east of Sterling Street, which is two-way. Howard and Harrison Streets are one-way streets westbound; although Howard Street is two-way east of Fremont, and Harrison Street is two-way east of Third Street. King Street is used for two-way traffic.

East-west streets in the study area include Market and Mission Streets, which provide two lanes of traffic in each direction and are designated as "Transit Preferential Streets" in the *San Francisco General Plan*. Mission Street is a transit-preferential arterial, having one of its two lanes in the westbound direction, between Main Street and Third Street (7 a.m. to 6 p.m., weekdays) and between Fourth and Eleventh Streets (4:00 to 6:00 p.m., weekdays), dedicated as a bus-only lane. In the eastbound direction, Mission Street has a bus lane between Eleventh Street and Fifth Street (7:00 to 9:00 a.m. and 4:00 to 6:00 p.m., weekdays), and between Third Street and Beale Street (7:00 a.m. to 6:00 p.m., weekdays).

Market Street also serves as a transit-oriented arterial. It has two lanes in each direction with bus and historic trolley stops on center islands and bus stops at the curb. The left curb lanes on First Street (between Market Street and Howard Street) and on Fremont Street (between Mission Street and Market Street) are also exclusive bus lanes.

Under existing conditions, the study area contains two off-ramps from the Bay Bridge: at Fremont Street between Folsom Street and Howard Street and at Fremont and Harrison Streets. There are three I-80/Bay Bridge eastbound-on-ramps in the study area: Essex and First Streets (both at Harrison Street), and Bryant Street at Sterling Street. Access to and from the Peninsula using the I-80 freeway, that is, via on- and off-ramps at Fourth Street between Harrison and Bryant Streets, is not included in the study area. The Sixth Street I-280 on- and-off ramps at Brannan Street are also not part of the traffic study area.

3.2.3 EXISTING TRAFFIC CONDITIONS

This section outlines existing traffic conditions in the project area. The data were developed for the City of San Francisco to analyze the Rincon Hill, Mid-Market, SOMA, and Transbay areas.

Traffic operating conditions for surface streets in the study area are described using level of service indices. These statistics indicate the levels of congestion and delay that occur in the study area under existing conditions.

Level of Service (LOS) designations are used as qualitative descriptors of an intersection's performance based on traffic delays. An intersection's LOS could range from A, representing free-flow conditions, to F, representing jammed conditions, corresponding to average delay, as follows.

Level of Service for Intersections

Level of Service	Average Vehicle Delay (Seconds per Vehicle)
A	$\leq$ 5.0
B	5.1 to 15.0
C	15.1 to 25.0
D	25.1 to 40.0
E	40.1 to 60.0
F	$\geq$ 60.0

Table 3.2-1 presents the LOS for base year (existing) conditions at key intersections in the study area. The table indicates that, under base year conditions, the 27 signalized intersections analyzed operate at an acceptable LOS (D or better) during the weekday morning and evening peak commute hours, with the exception of five intersections: First/Folsom, Second/Harrison, Essex/Harrison, First/Harrison, and Second/Bryant.

Table 3.2-1
PM Peak-Hour Intersection Delay (seconds per vehicle) and Level of Service (LOS) Summary
Existing (2001) and Projected 2020 No Project Traffic Conditions

Intersection	2001		2020 No Project	
	Delay	LOS	Delay	LOS
1. First/Market	25.9	D	34.8	D
2. Fremont/Market	15.2	C	27.1	D
3. Second/Mission	10.2	B	16.0	C
4. First/Mission	27.1	D	**59.5**	**E**
5. Fremont/Mission	21.8	C	22.8	C
6. Beale/Mission	14.9	B	20.0	C
7. Main/Mission	15.6	C	21.9	C
8. Second/Howard	12.3	B	25.7	D
9. First/Howard	31.9	D	**42.1**	**E**
10. Fremont/Howard	20.1	C	29.4	D
11. Beale/Howard	16.2	C	28.7	D
12. Main/Howard	15.4	C	25.2	D
13. Spear/Howard	13.9	B	15.5	C
14. Second/Folsom	32.5	D	**>60**	**F**
15. First/Folsom	**>60**	**F**	**>60**	**F**
16. Fremont/Folsom	7.7	B	22.6	C
17. Beale/Folsom	14.5	B	14.7	B
18. Main/Folsom	12.1	B	15.6	C
19. Spear/Folsom	11.1	B	13.3	B
20. The Embarcadero/Folsom	18.2	C	31.3	D
21. Second/Harrison	**44.9**	**E**	**>60**	**F**
22. Essex/Harrison	**>60**	**F**	**>60**	**F**
23. First/Harrison	**>60**	**F**	**>60**	**F**
24. Fremont/Harrison	37.0	D	**47.8**	**E**
25. Main/Harrison	32.0	D	**>60**	**F**
26. Spear/Harrison	15.4	C	22.9	C
27. Second/Bryant	**>60**	**F**	**>60**	**F**

Sources: San Francisco County Transportation Authority, Wilbur Smith Associates, September 2001

3.2.4 FUTURE STREET NETWORK IN PROJECT AREA

The following roadway improvements are not part of the proposed Terminal / Extension / Redevelopment project, but are expected to be in place by the year 2020. Most of these changes would be related to the roadway improvements called for under the San Francisco Department of Parking and Traffic (DPT) Variant Alternative, selected by the San Francisco Board of Supervisors as the Locally Preferred Alternative for the replacement of the Embarcadero Freeway and the Terminal Separator Structure.

- The existing I-80 Fremont Street off-ramp would be modified. Design for this off-ramp is currently under discussion between Caltrans and the City/County of San Francisco.

- Fremont Street would be restriped to include an additional mixed-flow through lane from the I-80 westbound off-ramp at Harrison Street to and across Market Street. (Fremont Street currently has four mixed-flow lanes from Howard to Mission Streets and two mixed-flow lanes and a transit-only lane from Mission to Market Streets.) The current two-way segment between Folsom and Harrison Streets would remain two-way operation. At Mission Street, there would be three through lanes, one left-turn-only lane, and one right-turn-only (transit excepted) lane. At Market Street, there would be a left curb transit-only lane, a transit island, and three through lanes. The left-most through lane pavement would include the F-Market line transit tracks.

- First Street would be restriped between Howard and Harrison Streets to provide a new peak-hour only left-side transit lane against the east curb. Left turns from First Street onto Harrison Street would be allowed in this transit lane during peak hours.

- Harrison Street would be re-striped to one-way westbound, from First Street to Third Street.

- When warranted by congestion levels in the future (sometime before the year 2015), the existing evening peak-period carpool operation on the Bryant Street approaches to the Sterling Street on-ramp would be changed to mixed-flow operation, and the current mixed-flow operation on the Essex Street approach to the Bay Bridge would be restricted to HOV operation during the evening peak period.

3.2.5 FUTURE TRAFFIC CONDITIONS: NO-PROJECT ALTERNATIVE

Table 3.2-1 presents the current 2001 and projected 2020 No-Project LOS conditions for the 27 study intersections during the evening peak hour. The levels of service shown reflect normal traffic conditions.

Given the high volume-to-capacity ratios estimated at the freeway on-ramps in the vicinity of the existing Transbay Terminal, the intersections near these ramps would quickly deteriorate to less than acceptable conditions (LOS E or F) in the case of an accident, construction, or a stall on the Bay Bridge or on U.S. 101, or in the case of greater traffic volumes (on the freeway or on local streets) than those projected to occur under normal conditions. The DPT estimates that "incident" conditions occur in the evening peak period about 25 percent to 30 percent of weekday evenings, and less often in the morning commute period.

Table 3.2-1 shows that five additional intersections have projected increases in delay to unacceptable levels (LOS E or F) between 2001 and 2020 for the evening peak hour. These are First/Mission, First/Howard, Second/Folsom, Second/Harrison, and Main/Harrison. Two other intersections are projected to degrade from LOS C to D between 2001 and 2020: Beale/Howard and Embarcadero/Folsom.

3.3 PARKING

The focused parking study area is bounded by Market Street to the north, Fourth Street to the west, Townsend Street to the south, and The Embarcadero to the east (Figure 3.3-1). This study area represents an approximate 10-minute walking distance to and from the existing Transbay Terminal site. The parking analysis focuses on off-street parking facilities such as lots and garages in the South-of-Market area.

Within the study area, the City, Port, and Caltrans as well as private entities are responsible for managing parking. The Port of San Francisco is responsible for on-street and off-street parking resources within its jurisdiction, including spaces along The Embarcadero. The San Francisco DPT is responsible for on-street parking outside Port jurisdiction. Off-street parking resources outside Port jurisdiction are generally privately owned and managed. Some off-street parking areas are located on land owned by Caltrans, which leases lots to private operators.

Parking garages and surface lots are scattered throughout the study area. Most are small-to-medium in size, containing 20 to 350 parking spaces. Some larger garages also exist, with capacities of 700 spaces or more. Weekday midday and evening period field surveys were conducted in August 1999 and January 2001 by Wilbur Smith Associates to determine the occupancy rate of the parking supply in the study area. The data presented in Table 3.3-1 show an overall parking occupancy rate of 85 percent during the midday on weekdays.

Table 3.3-1
Existing Parking within the Project Study Area

Type of Parking Facility	Number of Parking Facilities	Parking Spaces Available	Parking Spaces Used	Percent Occupancy [1]
Garage	30	7,631	6,288	82%
Lot	44	6,495	5,653	87%
Lot/Garage	2	215	200	93%
Total	74	14,341	12,141	85%

Notes: [1] Weekday - midday

Source: Wilbur Smith Associates, August 1999. Field checked January and November 2001.

In addition to parking in the lots and garages, there are approximately 2,750 on-street spaces in the study area. About 200 of these spaces are under the San Francisco Port Authority's jurisdiction. The on-street parking spaces are generally relatively full during normal weekday conditions.

Figure 3.3-1: Parking Study Area

3.4 NON-MOTORIZED TRAFFIC CONDITIONS

This section reviews the existing pedestrian and bicycle conditions in the area surrounding the Transbay Terminal and includes the following analyses:

- Pedestrian levels of service at five intersections – crosswalks and corners;
- Sidewalk widths throughout the study area;
- Qualitative analysis of on-sidewalk pedestrian conditions throughout the study area;
- Origin/destination analysis of study area pedestrian traffic; and
- Bicycle access and traffic counts at five intersections.

Pedestrian conditions are presented first, followed by bicycle conditions.

3.4.1 PEDESTRIAN CONDITIONS

The City and County of San Francisco adopted a Downtown Streetscape Plan in 1995 that assigns a street typology to downtown roadways. The type of streets include "Special Streets," "Second Level Streets," "Destination Streets," "Walkthrough Alleys," and "Base Case Streets." The following street designations apply to the streets in the area surrounding the Transbay Terminal,

Special Streets:	Mission Street
Second Level Streets:	Beale Street, Second Street
Walkthrough Alleys:	Ecker, Natoma, Minna, Garden Walk
Base Case:	All other streets

The Downtown Streetscape Plan applies design guidelines and standards based on the street designations. Amenities, such as public art, banners, benches, sidewalk displays, and private street light installation are encouraged on Second Level Streets, and distinctive, decorated sidewalk elements are reserved for Special Streets.

3.4.1.1 Intersection Analysis

Evening peak hour pedestrian and bicycle counts were conducted at the following five intersections:

- Mission and First Streets;
- Mission and Fremont Streets;
- Howard and First Streets;
- Howard and Fremont Streets; and
- Folsom and Beale Streets.

The first four intersections are those that immediately surround the Transbay Terminal. The fifth intersection was selected for analysis given the projected levels of future development along Folsom Street. The counts were conducted between 4:00 p.m. and 7:00 p.m. The locations of the intersections are shown in Figure 3.4-1. The Levels of Service (LOS) for the five intersections were calculated using the methodology from the 1994 update to the 1985 Highway Capacity Manual. Additional qualitative analysis follows the calculations of LOS. Crosswalk and corner LOS are measurements of the amount of space (square feet) each pedestrian has in the crosswalk or on the corner. These measurements depend on pedestrian volumes, signal timing, corner dimensions, crosswalk dimensions and roadway widths. LOS A represents free-flowing pedestrian conditions, while LOS F indicates that there are substantial restrictions to pedestrian movement and speed. Two aspects of pedestrian traffic were measured: standard flow and maximum surge conditions. Maximum surge occurs when pedestrians clump together due to sidewalk obstructions, blocking by a group of slower-moving pedestrians, a simultaneous departure or arrival by many pedestrians, or when pedestrians from either side of the crosswalk meet mid-way.

Pedestrian conditions as measured by this LOS analysis show that all the crosswalks analyzed are functioning at LOS B or better during both standard flow and surge conditions. The majority of the corners are also functioning at LOS B or better, although two of 20 corners analyzed showed LOS C. The crosswalk and corner LOS analysis is summarized in Table 3.4-1, Existing Pedestrian LOS. Figure 3.4-1 maps the intersections and their levels of service.

Table 3.4-1
Existing Pedestrian LOS – PM Peak Conditions (Peak 15 Minutes)

Intersection	Cross-walk	Ped Space (sq ft/ped)	LOS	Surge LOS	Corner	Ped Space (sq ft/ped)	LOS
Mission & First	North	64	B	B	NW	43	B
	East	125	B	B	NE	34	C
	South	193	A	B	SW	100	B
	West	149	A	B	SE	99	B
Mission & Fremont	North	109	B	B	NW	50	B
	East	171	A	B	NE	62	B
	South	75	B	B	SW	214	A
	West	126	B	B	SE	63	B
Howard & First	North	389	A	A	NW	118	A
	East	319	A	A	NE	192	A
	South	890	A	A	SW	103	B
	West	245	A	A	SE	69	B
Howard & Fremont	North	115	B	B	NW	80	B
	East	308	A	A	NE	98	B
	South	806	A	A	SW	35	C
	West	348	A	A	SE	136	A
Folsom & Beale	North	689	A	A	NW	211	A
	East	1083	A	A	NE	213	A
	South	467	A	A	SW	160	A
	West	508	A	A	SE	226	A

Source: Nelson\Nygaard pedestrian analysis, August 2001.

Figure 3.4-1 Map of Crosswalk and Corner Pedestrian Level of Service

The southern sidewalk between Fremont and First Streets along Howard Street was closed due to construction at the time this pedestrian analysis was conducted. As a result, the sidewalk widths at the southwest corner of Howard and Fremont and the southeast corner of Howard and First have been narrowed from their traditional widths. While fewer pedestrians are using these corners due to the blocked sidewalk, the narrower holding area at each of these corners negatively impacts the LOS.

The evening peak 15-minute period varied between and within each intersection. Of the twenty corners analyzed, eight saw their peak pedestrian volumes between 5:00 p.m. and 5:15 p.m., while six peaked between 5:15 p.m. and 5:30 p.m.

3.4.1.2 Sidewalk Conditions

Sidewalk widths were measured in the area surrounding the Transbay Terminal from Main Street on the east to Folsom Street on the south to First Street on the west, and to Mission Street on the north. Sidewalk widths vary throughout the area and even within the same block. In general, widths range from about eight feet to 16 feet. An exception is the temporary condition created by construction on Howard Street between First and Fremont. In this area, temporary sidewalks are as narrow as four feet. Figure 3.4-2, Sidewalk Dimensions, shows a schematic of sidewalk widths throughout the area.

Some general observations about pedestrian conditions in the area are:

- Sidewalks are widest and most attractive in the northeast corner of the defined area (e.g., Main and Mission; Beale and Mission). In this area, some sidewalks feature surface detail (e.g., bricks), sidewalk tables, and well-groomed street trees.

- The further a pedestrian moves south in the defined area, the less attractive become the sidewalks. Several areas of sidewalk along Folsom Street are cracked and rutted; several sidewalk sections in the southern part of the study area feel “barren” given the parking lots, large faceless buildings and construction sites that front the street.

- The pedestrian experience along Fremont and First Streets is hampered by the Transbay Terminal structure itself. Where the terminal crosses the street, the sidewalks are wide, but they are dark and more likely to be inhabited by members of the homeless community.

- Morning traffic turning left off Folsom onto Fremont Street creates conflicts with pedestrians crossing Fremont on the north side of the intersection.

- Evening traffic turning left off Howard onto First Street creates conflicts with pedestrians crossing First Street on the south side of the intersection.

- Intersections along Folsom Street do not have pedestrian crossing signals.

Figure 3.4-2: Sidewalk Dimensions

- The north-south streets of First, Fremont and Beale have fewer street trees than do the east-west streets of Mission and Howard. Street trees and street furniture vary from block to block and within blocks.

- Street furniture in the area is limited to newspaper racks, trash receptacles, parking meters, and tall light stands designed for traffic lighting. While newspaper racks do not necessarily impede pedestrian flow, they often clutter the corners and many are not well maintained.

3.4.1.3 Special Pedestrian Conditions

The following three unique pedestrian conditions occur in the Transbay Terminal area:

1. Morning unloading of casual carpoolers at Howard and Fremont Streets;
2. Evening queuing for casual carpoolers along Beale Street; and
3. Evening queuing for Golden Gate Transit buses along Mission and Fremont Streets.

Morning Casual Carpool Unloading. During the morning commute, many carpools unload their passengers at the intersection of Howard and Fremont Streets. Observed pedestrian flows during this morning period revealed that there is not adequate curb space for cars unloading these passengers. The situation has been temporarily exacerbated by the construction occurring on Howard Street between Fremont and First Streets. Passengers often disembark vehicles into Howard Street as cars make the turn off Fremont. The unloading of passengers creates temporary back-ups of vehicles turning left onto Howard from Fremont.

Evening Casual Carpool Queues. In the evenings, commuters who work in downtown San Francisco and live in the East Bay queue up along the west side of Beale Street between Folsom and Howard Streets to wait for casual carpool rides home. The pedestrian queues begin to form around 3:00 p.m. and reach their peak between 5:00 p.m. and 5:15 p.m. The line for carpools to Vallejo, Fairfield, and Suisun forms at the north end of the block closest to Howard Street and is the longest of the carpool lines. At its longest, the Vallejo/Fairfield/Suisun queue snakes up the block toward Folsom Street until it gets too close to the neighboring Hercules/Richmond queue. It then doubles back on itself, travels down the block toward Howard Street and wraps around the corner onto Howard. The carpool lines block the sidewalk, but those waiting in the queues are orderly and allow passage by through-pedestrians. There is no shelter available for waiting passengers, and some casual carpoolers wait up to an hour for a carpool ride.

By 5:15 p.m., the carpool lines have shrunk to just a few waiting commuters and by 6:00 p.m., there is no one standing in line. Instead, the waiting carpools begin to queue at the curb. At most, four cars were observed lined up at the curb, and there is adequate curb space to accommodate these vehicles. At the south end of the block, there is the potential that queued-up vehicles could block access to the Golden Gate Transit bus storage site at Howard and Main

Streets. The volume of vehicles observed, however, did not approach levels that would create this condition.

Evening Golden Gate Transit Queues. There are three main Golden Gate Transit (GGT) queue areas, as follows:

1. The north side of Mission Street between First and Fremont Streets, near First;
2. The west side of Fremont Street just south of Mission Street; and
3. The west side of Fremont Street just north of Mission Street.

The GGT bus stops along Mission Street are well signed with a large GGT kiosk that clearly identifies which GGT buses stop where and includes some bus schedules. Passengers for GGT, SamTrans, and Muni buses line up along this 14-foot wide sidewalk area. The bus shelter is closest to First Street and to the Muni stops. It is not large enough to accommodate all waiting passengers. There is some queuing for the three bus services and sometimes it is unclear to the passenger which queue is for which bus. Overall, however, passengers line up in an orderly fashion and allow through-pedestrians to pass by. When rounding the corner from First onto Mission Street, there is some pedestrian blockage due to the location of the bus shelter and waiting passengers. This is also the corner with the highest observed peak pedestrian flows in the area (see Figure 3.4-1) and a pedestrian LOS of C.

The GGT bus stops along Fremont Street just south of Mission Street have the longest queues and create the most sidewalk congestion. The congestion peaks between 5:15 p.m. and 5:30 p.m. when as many as 25 people wait in a 144-square-foot area. The sidewalk width in this area is about 14.5 feet, but the bus shelter reduces its effective width. In addition, the sidewalk is bordered by a temporary plywood wall that prevents waiting bus passengers from being able to step back from the sidewalk. The bus queue travels up Fremont Street and at times provides only about two feet of clearance for through pedestrians. This GGT stop is also not well-signed. There is a poorly painted curbline stop and a GGT decal on a traffic signal post. Another difficulty at this stop is a lack of curb space for buses to pull up at the same time.

The third GGT bus stop in the area is located along Fremont Street just north of Mission Street. This stop has the fewest pedestrian queuing problems. The sidewalk at the stop is no wider than the sidewalk at the stop south of Mission Street, but the adjacent building features an overhang, which creates an additional six to ten feet of pedestrian space and provides shelter for waiting passengers. Passengers have enough room to create an orderly line that allows room for through pedestrians.

At all three stops, the highest number of pedestrians waiting for buses occurs between 4:30 p.m. and 5:15 p.m. Figure 3.4-3, Pedestrian Activity Areas, summarizes the pedestrian conditions in the Transbay area.

Figure 3.4-3: Pedestrian Activity Areas

3.4.1.4 Origin/Destination Analysis

It is important to understand the destination of pedestrians flowing out of the Transbay Terminal area to identify key pedestrian travel corridors. To gather this information, surveys were conducted around the Terminal. Passengers riding Golden Gate Transit, SamTrans and other transportation modes were intercepted outside the Transbay Terminal. In addition, surveys were distributed to waiting AC Transit passengers inside the Transbay Terminal. The surveys asked these Transbay Terminal area patrons about their destinations after leaving the terminal area and origins before coming to the terminal area. Valid surveys were collected from 2,570 Transbay Terminal patrons. About 690 surveys were collected from passengers outside the terminal and about 1,880 were collected from people inside the terminal.

The survey was conducted during evening commute hours and asked people about their travel patterns both when leaving the terminal in the morning and returning to the terminal area in the evening. Patrons were asked how they got to the Terminal area in the morning. The mode of travel to San Francisco of those surveyed is shown in Table 3.4-2.

Table 3.4-2
Mode of Travel to San Francisco

Mode	Frequency	Percent
AC Transit	1,078	41.95
Carpool	826	32.14
Golden Gate Transit	249	9.69
MUNI bus	159	6.19
BART	119	4.63
SamTrans	63	2.45
Napa Valley Commute Club	25	0.97
Drove	14	0.54
Ferry	9	0.35
Bike Shuttle	8	0.31
MUNI light rail	6	0.23
Walked	4	0.16
Greyhound	3	0.12
Other/No Response	3	0.12
Bicycled	2	0.08
Caltrain	1	0.04
VTA	1	0.04
Total	**2,570**	**100**

Source: Nelson\Nygaard, August 2001

Figure 3.4-4 shows the San Francisco destinations of the Transbay Terminal area patrons after leaving the terminal area in the morning.

Figure 3.4-4: San Francisco Destinations of AM Transbay Terminal Area Patrons

The majority (78 percent) of Transbay Terminal area patrons walk from the Terminal (or Terminal area) to their morning destinations. Just 1.7 percent (44 people) use BART to get to their destinations, 7.3 percent use Muni buses and 3.0 percent use the Muni Metro light rail. Table 3.4-3 shows how terminal patrons get to their morning destinations within San Francisco.

Table 3.4-3
Mode of Travel from the Transbay Terminal to Morning San Francisco Destinations

Mode	Frequency	Percent
Walked	2001	77.86
MUNI bus	188	7.32
No Answer	138	5.37
MUNI light rail	76	2.96
BART	44	1.71
N/A-didn't come through area in morning [1]	27	1.05
Bicycle	26	1.01
Drove	24	0.93
Used a shuttle	23	0.89
Other	15	0.58
SamTrans/Golden Gate Bus	5	0.19
Caltrain	3	0.12
Total	**2570**	**100**

Notes: [1] Since the survey was conducted in the PM, this choice was provided.

Source: Nelson\Nygaard, August 2001

According to Table 3.4-3 above, 1.71 percent of Transbay Terminal Area patrons used BART to get their final destinations in San Francisco after coming to the Transbay Terminal area in the morning. Table 3.4-4 below shows the mode that patrons transferred from before getting on BART to travel within the city.

About 27 percent (12 of 44) of those who said they used BART to get to their morning destinations in the city from the Terminal area were actually on BART for the whole trip[8]. Just 32 of the 2,543 patrons surveyed (1.3 percent) who came through the Transbay Terminal area in the morning transferred from another travel mode to BART.

[8] Because the survey was conducted in the evening, it was possible to have surveyed patrons in the terminal area who rode BART for their entire morning commute and did not actually come through the terminal area in the morning. Thus, these people did not transfer from another mode to BART.

Table 3.4-4
Travel Mode of Survey Respondents
Using BART to get to San Francisco Destinations
In the Morning

Mode	Number [1]	Percentage
AC Transit	11	25.00%
BART	12	27.27%
Carpool	9	20.45%
MUNI bus	3	6.82%
Golden Gate Transit	9	20.45%
Total	**44**	**100%**

Notes: [1] Terminal Area Patrons Using BART to get to their SF destination in the morning.
Source: Nelson\Nygaard, August 2001

3.4.2 BICYCLE CONDITIONS

3.4.2.1 Bicycle Access

Howard, Market, Folsom, and Second Streets and The Embarcadero are designated as citywide bike routes serving the area. The Embarcadero and Folsom Street feature striped bike lanes while Howard, Market, and Second Streets do not. Although there are some signs indicating bike routes in the study area, they are not common.

There are many obstacles to bicycle riding on Folsom, Howard, and Market Streets. The six-foot-wide bike lane on Folsom Street is not continuous throughout the study area. The bike lane stops and starts to allow for on-street parking and right-hand-turn lanes. Street parking on Howard Street forces bikes and cars to share a narrow lane along much of its length while stopped transit vehicles and traffic islands can impede both bicyclists and cars alike on Market Street. At the intersections of First and Howard Streets and Beale and Howard Streets, right-hand-turn lanes force bicycles to merge into traffic.

Public transit serving the area accommodates bicycles. Both BART and Caltrain allow bikes on trains. Caltrain has bike racks on certain cars, and each train is able to accommodate up to 24 bikes. Most of AC Transit's Transbay buses and most of SamTrans' buses are equipped with bicycle racks. The Transbay Terminal itself has eight bike lockers. The City of San Francisco's Department of Parking and Traffic purchased these lockers with a Clean Air Quality grant. The lockers are maintained with user fees. Lockers can be rented for six months or a year, for $45 and $75, respectively. All are currently rented and there is a waiting list.

Caltrans operates a bike shuttle between the MacArthur BART station in Oakland and the Transbay Terminal during morning and evening commute hours. Service consists of six morning and six evening trips. Four of the morning trips run east to west (Oakland to SF) and two run in the reverse commute direction (SF to Oakland). In the evening, four trips run from the Transbay

Terminal (SF) to MacArthur BART (Oakland) and two run in the opposite direction. The fare is $1.00 each way. Each trip can accommodate up to 14 bicycles.

3.4.2.2 Bicycle Traffic Levels

While there is no standard for defining bicycle Levels of Service, bicycles counts were conducted to get a sense of the volume of bicycle traffic flowing through the study area. The counts were conducted at the five-named intersections between 4:00 p.m. and 7:00 p.m. The peak 15-minute bicycle counts for each intersection are shown in Table 3.4-5.

Table 3.4-5
Peak 15-Minute Bicycle Traffic Volumes

Intersection	Street	Bikes Per Peak 15-Minutes
Mission & First	Mission	2
	First	5
Mission & Fremont	Mission	3
	Fremont	2
Howard & First	Howard	11
	First	5
Howard & Fremont	Howard	9
	Fremont	2
Folsom & Beale	Folsom	3
	Beale	3

The highest volumes of bicycle traffic in the evening peak were observed on Howard Street. Overall, bicycle traffic is light at the intersections observed. Figure 3.4-5 shows the bicycle network in the study area.

Figure 3.4-5 Map of Bicycle Network