



DRAFT MEMORANDUM

Date: February 5, 2008

To: Tracy Abbott, Biggs-Cardosa

From: Emily Johnson and Matthew Ridgway, Fehr & Peers

Subject: *Summary of Data Collection, Analysis, Usage Forecasts and Design Recommendations for the South Bayfront Bridge in Emeryville, CA*

WC07-2476

Fehr & Peers was charged with developing estimates of use for the planned South Bayfront pedestrian-bicycle bridge in Emeryville, CA. These usage estimates will help the Project Team develop a design for the bridge that accommodates the expected level and mix of use. The planned bridge will span the Union Pacific Railroad tracks between the Bay Street shopping center and Horton Street in the City of Emeryville.

This memorandum presents the results of Fehr & Peers' data collection, analysis, usage estimates, and design recommendations for the South Bayfront Bridge.

The memorandum is divided into five sections:

- I. Project Overview and Forecasting Method
- II. Pedestrian and Bicycle Counts at Comparison Facilities
- III. Land Use Data and Analysis
- IV. South Bayfront Bridge Usage Forecasts
- V. South Bayfront Bridge Design Recommendations

I. PROJECT OVERVIEW AND FORECASTING METHOD

Project Overview

The South Bayfront Bridge will be a bicycle and pedestrian bridge over the Union Pacific Railroad (UPRR) tracks in the City of Emeryville. The bridge is intended to accommodate a mix of users including bicyclists and pedestrians, as well as people using wheelchairs, runners, skateboarders, and other non-motorized travelers. It will span the UPRR main line, and adjacent spur lines and rail yard, for a total length of approximately 300 feet. The west landing will be on Ohlone Way, adjacent to the Bay Street parking structure and within a 30-foot setback from the UPRR rail line. The east landing will be within the proposed Horton Landing Park, adjacent to the 53rd Street easement connecting to Horton Street, just west of the Novartis campus.

The bridge will eliminate a barrier to direct non-motorized travel between two redeveloping areas. It will improve access between residential and employment centers near Horton Street and the Bay Street and Powell Street Plaza shopping areas. It will also improve connections between recreational bicycle and pedestrian trails in the region, especially the Bay Trail, and provide alternative transportation options for the Emeryville community.

The bridge location and its connection to bicycle and pedestrian routes in the area are shown on **Figure 1**.

Forecasting Method

Fehr & Peers developed forecasts of pedestrian, bicycle, and other types of use of the bridge to inform the design and ensure that all bridge users are accommodated. These forecasts are based on the observed use of five railroad crossings (bridges and at-grade crossings) and one bicycle bridge in the area. We developed relationships between the land use and user volumes at the six locations, and used these relationships to estimate total use of the South Bayfront Bridge as well as separate mode splits, or proportion of total volume, for various user types (pedestrians, adult bicyclists, child bicyclists, runners, etc).

II. PEDESTRIAN AND BICYCLE COUNTS AT COMPARISON FACILITIES

Data Collection

We observed the use of five railroad crossings (bridges and at-grade crossings) and one bicycle bridge in the area. The comparison facilities were selected based on discussions with the Project Team, and are intended to represent similar demand and type of use as that expected at the South Bayfront Bridge.

The six comparison facilities include:

1. The 40th Street overcrossing (pedestrian sidewalk and bicycle lanes) in South Emeryville (near IKEA)
2. The Powell Street Bridge/overcrossing between Peladeau Street and Christie Avenue in Emeryville
3. The Powell Street pedestrian undercrossing (just north of the Powell Street Bridge in Emeryville)
4. The Emeryville Amtrak pedestrian-bicycle bridge (between the Emeryville Amtrak Station and Shellmound Street)
5. The 65th Street at-grade railroad crossing between Overland Avenue and Shellmound Street in Emeryville
6. The I-80 Bicycle/Pedestrian bridge between Berkeley's Aquatic Park and the Berkeley Marina

Manual counts were conducted on each of the comparison facilities on Friday, October 26 from 11:30 AM to 1:30 PM. In addition, manual counts were conducted on the I-80 Bridge and the 40th Street overcrossing on Saturday, October 13, from 11:30 AM to 1:30 PM. Both days were sunny and clear. The dates and times were selected to represent the peak use of the facilities. The Friday mid-day represents peak utilitarian use, with local workers going to lunch, running errands, and exercising. The Saturday mid-day represents peak recreational use, with people walking or bicycling for exercise and leisure. A sample of users on each bridge was interviewed to determine their origin and destination.

Each of the comparison facilities is described in more detail below, with a summary of the observed use. **Figure 2** shows the locations of the six comparison facilities as well as the South Bayfront Bridge.



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40th Street overcrossing

The 40th Street overcrossing provides access between retail and residential uses east of the railroad tracks in South Emeryville and IKEA, the Bay Street shopping center, and other retail and entertainment west of the railroad tracks. The overcrossing includes two vehicle lanes and a bicycle lane in each direction, as well as a raised sidewalk on the north side of the roadway. Total use on the overcrossing was 20 persons on Friday (12:30 to 1:30 PM) and 32 persons on Saturday (12:30 to 1:30 PM). Bicyclists represented 50 to 56 percent of the users, pedestrians represented between 40 and 45 percent of the users, and runners represented 0 to 10 percent of the users. On Saturday, those interviewed were on shopping-related trips. On Friday, about 40 percent of users were on lunch trips; another 40 percent were on shopping trips; and the remainder was running errands.



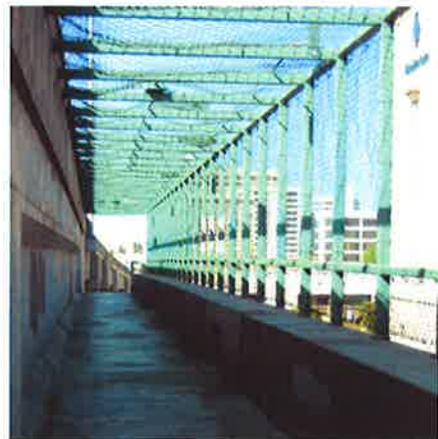
Powell Street Bridge

The Powell Street Bridge provides access between mainly residential uses (and some commercial uses) east of the railroad tracks and the Powell Street Plaza shopping center, Bay Street, Emeryville Public Market (restaurants and retail), residential uses, and the Emeryville Marina west of the railroad tracks. The overcrossing includes two vehicle lanes in each direction. There are no bicycle lanes or sidewalk. Total use on the overcrossing was 4 persons on Friday (12:30 to 1:30 PM). All four were bicyclists.



Powell Street Undercrossing

The Powell Street undercrossing provides access between offices and residential uses east of the railroad tracks and the Emeryville Public Market (restaurants and retail), Powell Street Plaza shopping center, and Bay Street shopping center west of the railroad tracks. The undercrossing is approximately five feet wide, and is accessed by two flights of stairs, making it difficult for bicyclists and impossible for wheelchairs to use. Total use on the undercrossing was 50 persons on Friday (12:00 to 1:00 PM). Pedestrians represented close to 90 percent of the users, and runners about 10 percent of the users. Of those interviewed, about 50 percent were on lunch trips; about 20 percent were exercising; and 10 percent each were on trips related to work, shopping, or other activities.



Emeryville Amtrak Bridge



The Amtrak Bridge provides access primarily between offices and residential uses east of the railroad tracks and the Emeryville Public Market, as well as additional retail west of the railroad tracks. The bridge is approximately eight feet wide, and is accessed by stairs and an elevator on each side, making it accessible for pedestrians, bicyclists, and wheelchair users. This crossing had the highest use of those studied, with a total of 269 persons on Friday (12:15 to 1:15 PM). Pedestrians represented 98 percent of the users, and bicyclists represented the remaining 2 percent. Based on observations, the vast majority of users (80

percent or more) were office workers going to lunch or taking a walk during their lunch break. The high amount of use is most likely because of the bridge's proximity to the Public Market. On average, about 10 percent of users used one or both elevators.

65th Street crossing

The 65th Street crossing provides access between industrial uses, offices, and residential uses east of the railroad tracks and the Emeryville Public Market (restaurants and retail) and residential, office, and retail uses west of the railroad tracks. The crossing is at-grade, and includes one travel lane in each direction and a sidewalk and pedestrian lane on the south side. There is a sign prohibiting pedestrian crossings on the north side. Total use on the crossing was 120 persons on Friday (12:30 to 1:30 PM). Pedestrians represented about 80 percent of the users, bicyclists represented about 10 percent, and runners represented about 10 percent. All of those interviewed were on lunch trips.



I-80 Bicycle/Pedestrian Bridge

The I-80 Bridge provides access between industrial, commercial, and residential uses east of I-80 (as well as Berkeley's Aquatic Park) and the Berkeley Marina west of I-80. The bridge is accessed by ramps, making it accessible to all users. It has a total width of about 15 feet, with two bicycle lanes separated by a dashed centerline, and a raised sidewalk on the south side. Total use on the bridge was 31 persons on Friday (12:15 to 1:15 PM), and 109 persons on Saturday (12:30 to 1:30 PM). On Friday, pedestrians represented about 7 percent of the users, bicyclists represented about 60 percent, and runners represented about 30 percent. On Saturday, pedestrians represented about 20 percent of the



users, bicyclists represented about 70 percent, and runners represented about 10 percent. All of those interviewed were using the bridge for exercise.

The count data is summarized in **Table 1** below. The complete counts for each facility are attached in **Appendix A**.

TABLE 1 PEAK HOUR USE ON COMPARISON FACILITIES										
Bridge	Peak Hour*	Total Use	Pedestrians	Adult Cyclists		Child Cyclists	Rollerbladers & skateboarders	Runners	East-bound	West-bound
				fast/riding	slow/walking					
I-80 Bridge	12:15-1:15 F	31	7%	29%	32%	0%	0%	32%	52%	48%
	12:30-1:30 S	109	18%	24%	42%	4%	1%	11%	42%	58%
Amtrak Bridge	12:15-1:15	269	98%	1%	1%	0%	0%	0%	53%	47%
Powell Street Overcrossing	12:30-1:30	4	0%	100%	0%	0%	0%	0%	50%	50%
Powell Street Pedestrian Under-crossing	12:00-1:00	50	88%	0%	0%	0%	0%	12%	54%	46%
40 th Street Overcrossing	12:30-1:30 F	20	40%	5%	45%	0%	0%	10%	45%	55%
	12:30-1:30 S	32	44%	31%	19%	6%	0%	0%	53%	47%
65 th Street at-grade crossing	12:30-1:30	120	83%	5%	4%	0%	0%	8%	52%	48%

* Peak hours for the I-80 Bridge and 40th Street overcrossing are followed by F or S to signify Friday or Saturday use respectively. All other bridges were counted on Friday only.

III. LAND USE DATA AND ANALYSIS

Method

In order to identify relationships between adjacent land uses and the observed levels of utilitarian non-motorized trips, Fehr & Peers collected parcel-based land use in GIS format from the City of Emeryville. The data within a ¼ mile radius around the five comparison sites in Emeryville was summarized. The ¼ mile radius was chosen because it represents a distance that people can easily walk. Data was not summarized for the I-80 Bridge, because it is used largely for recreational purposes. Potential projects and projects under construction were excluded so that the land use represented existing conditions. Some adjustments were made to the GIS data

based on aerial photographs and knowledge of land uses in Emeryville. The number of jobs and residents within the ¼ mile radius was estimated based on the land use, building footprint, and stories in the building¹ as well as common employment factors per 1,000 square feet and the average household size in Emeryville. These factors are as follows:

• Office: 1 job per 275 square feet	• Hotel: 0.9 jobs per hotel room ²
• Retail: 1 job per 500 square feet	• Cinema: 5.2 jobs per screen ³
• Industrial: 1 job per 500 square feet	• Other: 1 job per 400 square feet
• Public facilities: 1 job per 1,000 square feet	• Average Household size: 1.71 ⁴

Results

The total jobs and residents within ¼ mile of each comparison site were correlated to the use of the bridge to develop factors relating use of the bridge to the total number of residents and jobs around the bridge. The land use summary and factors for each comparison facility are shown in **Table 2**. Detailed calculations are included in **Appendix B**. **Figure 3** shows the land use around each comparison facility.

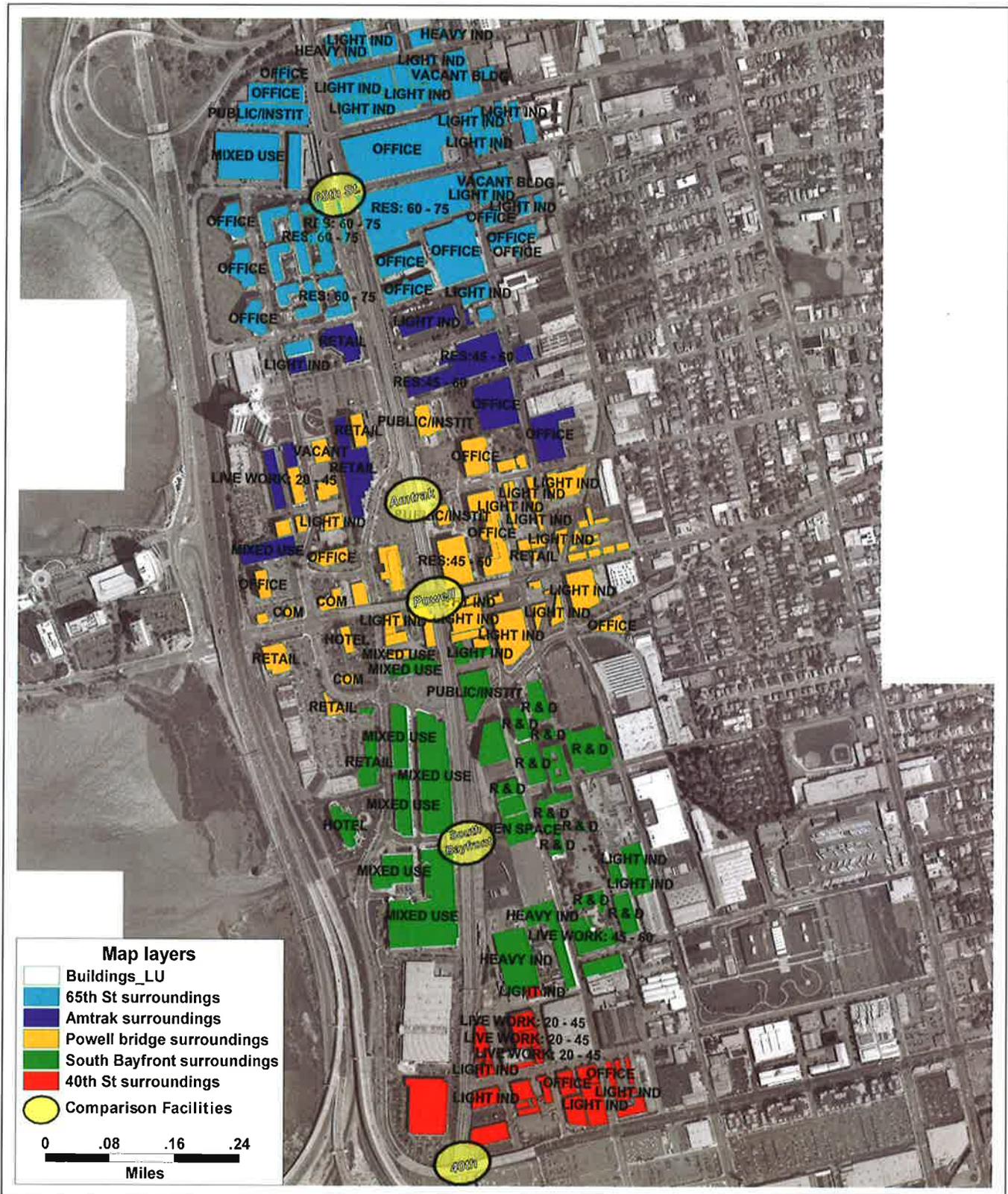
The most consistent factors are those that correlate bridge use to employment, and bridge use to total population and employment. These factors range from 0.00 (at the Powell Street overcrossing, because of its low use) to 0.05 users per job or per jobs plus residents, with an average of 0.02 users per job or per jobs plus residents. The factor of 0.02 is very low, and due to the small sample size, the actual factor could vary.

1 The total square footage for each building was estimated based on the building footprint multiplied by the number of stories, as provided in the GIS data.

2 The ITE Trip Generation Handbook states that "Studies of hotel employment density indicate that, on average, a hotel will employ 0.9 employees per room." (page 541)

3 Based on ITE *Trip Generation Handbook* rates for multiplex cinema (23 trips/screen, and 1 employee per 4.45 trips = 5.2 employees per screen).

4 From wikipedia.com



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TABLE 2							
COMPARISON FACILITY LAND USE SUMMARY							
Comparison site	Popu- lation¹	Employ- ment¹	Population + Employment	Bridge Use²	Users per Population	Users per Employment	Users per (Population + Employment)
Amtrak Bridge	547	5,341	5,888	269	0.49	0.05	0.05
Powell Street Overcrossing	257	4,080	4,337	4	0.02	0.00	0.00
Powell Street Pedestrian Under-crossing	257	4,080	4,337	50	0.19	0.01	0.01
40 th St. Overcrossing	278	912	1,190	20	0.07	0.02	0.02
65 th St. at- grade crossing	923	5,989	6,912	120	0.13	0.02	0.02
Average					0.18	0.02	0.02
Notes:							
¹ Within ¼ mile of the crossing, based on GIS data.							
² Friday counts were used for all crossings, to be consistent.							

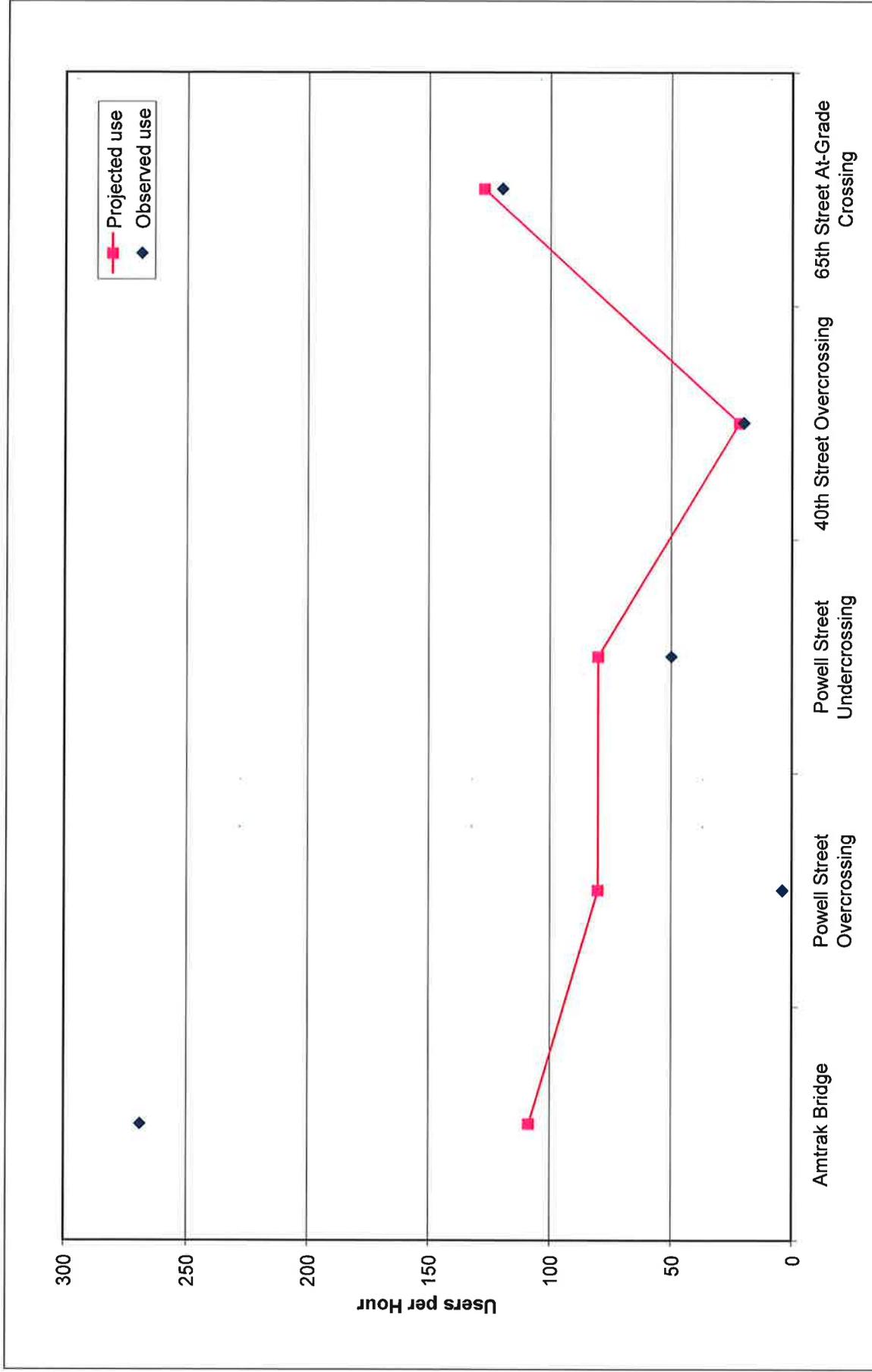
Figure 4 compares the observed levels of use on the five comparison facilities in Table 2 with the projected level of use based on the population and employment-based factor. Observed use on the Amtrak Bridge was substantially higher than projected by the factor (likely due to the relatively good design of the bridge, incorporating elevators and stairs), and observed use on the Powell Street overcrossing was substantially lower than projected by the factor (likely due to the lack of facilities for bicyclists and pedestrians on the overcrossing). Observed use on the other three facilities was close to that projected by the factor.

IV. SOUTH BAYFRONT BRIDGE USAGE FORECASTS

Method

The population and employment-based usage factor developed above was applied to the existing and estimated future land use within ¼ mile of the South Bayfront Bridge. The population and employment-based factor was used instead of the employment-only factor in order to account for the effects of residential development on bridge use. While residential land use does not appear to have a large effect on bridge use during the workday, it is likely to have a large effect on bridge use on the weekend. In fact, the projected Saturday use on the 40th Street overcrossing based on the population and employment-based factor is closer to the observed Saturday use than the projection based on the employment-only factor.

Future land use includes projects that are under construction, in the planning process, and potential projects. For both existing and future, we considered a Friday noon-time and a Saturday noon-time scenario. The Friday estimate represents mostly work-based trips to restaurants, shopping, and for exercise (based on the factor developed from data at the



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comparison sites), as well as some purely recreational trips (estimated to be similar to the Friday use of the I-80 Bridge). The Saturday estimate is based on the relative difference in use on Saturday compared to Friday at the 40th Street overcrossing, as well as a higher amount of recreational use (estimated to be about half of the Saturday use of the I-80 Bridge).

Results

Based on existing land use, we would expect approximately 110 peak hour users on Friday and 190 peak hour users on Saturday on the South Bayfront Bridge. With the projected future land use, we would expect approximately 160 peak hour users on Friday and 260 peak hour users on Saturday. These forecasts are shown in **Table 3**.

TABLE 3 SOUTH BAYFRONT BRIDGE USE FORECASTS								
Land Use/Day	Population	Employment	Population + Employment	Use Factor (Population + Employment) ¹	Saturday Factor ²	Bridge Use ³		
						Utilitarian ⁴	Recreational ⁵	Total
<i>Existing</i>								
Friday	759	3,746	4,505	.02	n/a	80	30	110
Saturday	759	3,746	4,505	.02	1.6	135	55	190
<i>Future</i>								
Friday	2,008	4,866	6,874	.02	n/a	130	30	160
Saturday	2,008	4,866	6,874	.02	1.6	205	55	260
Notes:								
¹ Based on average factor from Table 2.								
² Based on the relative difference in use on Saturday compared to Friday at the 40 th Street overcrossing.								
³ Numbers are rounded.								
⁴ This is equal to population plus employment, multiplied by the Use Factor and Saturday factor, if applicable.								
⁵ Friday recreational use is based on Friday counts at the I-80 Bridge; Saturday recreational use is assumed to be about half of the Saturday count at the I-80 Bridge								

Mode splits for various user types were also estimated, based on average mode splits from the comparison facility counts (weighted by the relative volume on each facility). Mode splits were developed for both utilitarian use (based on the Friday comparison counts) and recreational use (based on Friday and Saturday mode splits at the I-80 Bridge). The utilitarian and recreational mode splits were combined based on the proportion of each type of use projected at the South Bayfront Bridge to create an overall weighted average mode split. Directional splits (eastbound and westbound) were developed for the Friday and Saturday projections based on the average of the directional splits for the Friday and Saturday comparison counts. The estimated mode and directional splits are shown in **Table 4**.

TABLE 4								
SOUTH BAYFRONT BRIDGE PROJECTED PEAK HOUR MODE AND DIRECTIONAL SPLITS								
Land use	Day	Total Projected Use	Mode split ¹					Direction ²
			Pedes-trians	Adult Cyclists	Child Cyclists	Roller-bladers/skate-boarders	Runners	EB/WB
<i>Existing</i>								
	Friday	110	75 (70%)	25 (20%)	0 (0%)	0 (0%)	10 (10%)	51%/49%
	Saturday	190	130 (70%)	45 (25%)	5 (1%)	0% (0)	10 (4%)	48%/52%
<i>Future</i>								
	Friday	160	120 (70%)	25 (20%)	0 (0%)	0 (0%)	15 (10%)	51%/49%
	Saturday	260	190 (75%)	50 (19%)	5 (1%)	0 (0%)	15 (5%)	48%/52%
Notes:								
<p>¹ Friday mode splits are based on a weighted average of the mode splits for the Friday comparison site counts, applied to the projected utilitarian use, combined with the mode split for the Friday I-80 Bridge count, applied to the projected recreational use. The resulting utilitarian and recreational mode splits are combined based on the proportion of each type of use to create an overall weighted average mode split.</p> <p>Similarly, Saturday mode splits are based on a weighted average of the mode splits for the Friday comparison site counts, applied to the projected utilitarian use, combined with the mode split for the Saturday I-80 Bridge count, applied to the projected recreational use. The resulting utilitarian and recreational mode splits are combined based on the proportion of each type of use to create an overall weighted average mode split.</p> <p>Projected mode splits show both a percentage of total use and an estimated number of users. Numbers are rounded.</p> <p>² Friday directional splits are based on the average of the directional splits for the Friday comparison counts. Saturday directional splits are based on the average of the directional splits for the two Saturday comparison counts.</p>								

The estimates of use, mode split, and direction are based on a small sample, which is not statistically significant. In addition, we made the following assumptions:

- We have assumed that no users transfer from adjacent bridges/crossings to the South Bayfront Bridge, but some would likely transfer, particularly from the 40th Street overcrossing and the Powell Street undercrossing.
- The Saturday use estimates should be applied with caution, as they are based on the relative difference in use on Saturday compared to Friday at only one facility (the 40th Street overcrossing). The I-80 Bridge counts were not used for the Saturday estimate, because the I-80 Bridge serves substantially different land uses and trip types.
- We would expect higher-than-projected use of the South Bayfront Bridge if additional development occurs in the area around the bridge (for example, if the Center for Community Life is located near the bridge site) or adjacent to bikeways connected to the bridge (such as on Treasure Island, where 6,000 dwelling units are planned).

- Higher use could also occur if access to the Bay Bridge bike path and Bay Trail from South Bayfront is improved, making the South Bayfront Bridge an easier or more direct connection than the 40th Street overcrossing.

V. SOUTH BAYFRONT BRIDGE DESIGN RECOMMENDATIONS

Projected Use and Relevant Standards

Based on the projected future user volumes and mode splits described above, in a typical noon-time peak hour we would expect a total of between 160 and 260 bridge users, comprised of 100 to 200 pedestrians, 20 to 60 cyclists, and 10 to 20 runners. They would be split fairly evenly between eastbound and westbound travel.

Caltrans guidelines for Class I bicycle facilities state that on structures, the clear width between railings should be not less than 8 feet. The guidelines also state that it is desirable that the clear width on structures be equal to the minimum clear width of the path. While the minimum paved width for a two-way bike path is 8 feet, if heavy bicycle volumes and/or significant pedestrian volumes are expected, Caltrans recommends a width of 12 feet or more.⁵ Therefore, the minimum width between railings on a structure is 8 feet, but a width of 12 feet or more is recommended.

Based on Caltrans guidelines, the minimum width for one-way bicycle lanes is 4 feet.⁶ Pedestrian sidewalks are required to be a minimum of 5 feet for two-way travel. On some bridges, a curb and raised sidewalk may be preferred to a shared travelway in order to separate slower pedestrian traffic from bicycles (the I-80 pedestrian-bicycle bridge in Berkeley is designed this way).

FHWA Trail Level of Service Evaluation

FHWA recently developed a Shared-Use Path Level of Service Calculator that estimates the operations of a shared-use path based on total one-way user volume, proportions of various user types, path width, and the presence of a centerline⁷. The calculator was developed based on bicyclists' perceptions of comfort and freedom on various trail types, and has the following characteristics:

- It prioritizes cyclists' ability to maintain an optimum speed and maneuver freely.
- It is designed for use on a minimum 0.25-mile long trail segment.
- It assumes a peak hour factor of 0.85, meaning that it bases the analysis on a peak 15-minute period with 15 percent higher use than if the hourly volume were evenly split across the whole hour.
- It assumes a cyclist speed of 12.8 miles per hour.
- The score (level of service) is based on the trail's peak use, and thus represents a worst-case scenario.

Although the tool was designed for bicycle-pedestrian paths rather than bridges, it can provide information about the relative performance of the bridge at various widths, given the level of use

⁵ Caltrans *Highway Design Manual*, Chapter 1000, section 1003.2

⁶ Caltrans *Highway Design Manual*, Chapter 1000, section 1003.1

⁷ See <http://www.tfhr.com/safety/pedbike/pubs/05138/>

and mode split expected on the bridge. We evaluated the two basic designs of the bridge, using the projected future Saturday volumes and mode split:

- 1) A travelway of between 12 and 16 feet to be shared between all users, with or without a marked centerline.
- 2) A separated travelway, with a raised pedestrian walkway and two four-foot bicycle lanes to be shared between bicyclists, runners, rollerbladers and skateboarders. This design assumes that all pedestrians will use the raised walkway; therefore, the mode split excludes pedestrians.

The results of these tests are summarized in **Table 5**.

TABLE 5			
SHARED-USE PATH LEVEL OF SERVICE RESULTS			
Bikeway Width	Centerline	Level of Service¹	LOS Grade¹
<i>Shared Pathway</i>			
12	Yes	1.99	F
12	No	2.28	E
14	Yes	2.18	E
14	No	2.47	E
16	Yes	2.46	E
16	No	2.74	D
<i>Separated Bikeway</i>			
8	Yes	2.84	D
8	No	3.12	C
<p>Notes:</p> <p>¹According to the tool user guide, LOS A-C can be considered acceptable and D-F can be considered "degraded."</p> <p>A (4.0 or greater) = Excellent; optimum conditions for individual bicyclists; retains ample space to absorb more users of all modes.</p> <p>B (3.5 to 4.0) = Good bicycling conditions; retains significant room to absorb more users.</p> <p>C (3.0 to 3.5) = Fair; Trail has at least minimum width to meet current demand and to provide basic service to bicyclists. More pedestrians, runners, or other slow-moving users will begin to diminish LOS for bicyclists.</p> <p>D (2.5 to 3.0) = Poor; nearing functional capacity. Peak period speeds likely to be reduced by levels of crowding.</p> <p>E (2.0 to 2.5) = Very poor; trail has reached functional capacity; peak period travel speeds are likely to be reduced.</p> <p>F (less than 2.0) = Significant user conflicts should be expected.</p> <p>Source: <i>Shared-Use Path Draft Level of Service Calculator</i>, provided by FHWA staff; Fehr & Peers 2007.</p>			

Based on this evaluation, a shared travelway would provide a lower level of service for bicyclists than a separated travelway. A shared travelway of 16 feet with no centerline performs the best of the shared pathways, but would still require slowed speeds during peak periods. A separated bikeway of eight feet (with no centerline) would provide better service for bicyclists. However, several caveats should be considered:

- Cyclists on the bridge will be riding more slowly than they would on a path, due to the ramps and limited length of the bridge. Therefore, the relative speed differences between bridge users, and thus the impact of pedestrians on cyclists' level of service, will be less dramatic than the tool suggests.
- According to the tool, cyclists' level of service is most affected by sharing the path with slower users, particularly pedestrians. Because we expect a high proportion of pedestrians on the South Bayfront Bridge, cyclists will have a harder time passing during peak periods, and thus their perception of the bridge may be poor. However, cyclists are expected to represent about 20 percent of the peak hour users of the bridge. Pedestrians and other users may have a different perception, and may actually prefer a shared travelway to a separated walkway.

Recommendations

Based on the guidelines described above, the minimum width for a structure is 8 feet between railings. However, we do not recommend this width, given the level and mix of use expected on the bridge. Instead, we recommend a minimum width of 12 feet. Given the results of the trail level of service analysis, a width of between 12 and 16 feet would be preferred. The following two options outline our recommended design parameters for the South Bayfront Bridge:

Alternative One: Shared Travelway

- Provide a shared travelway with a total width of 16 feet. Under this design, bicycle lanes would not be striped separately from the pedestrian walkway, and pedestrians would walk on all areas of the bridge.
- Stripe a solid white four-inch edge line one foot from the edge of the bridge. This one-foot edge line provides a buffer for pedestrians; bicyclists will naturally ride further from the edge and will have an effective buffer of two feet. Additional clear distance may be needed if fences protrude or curve in, or are not continuous.
- Stripe a dashed yellow centerline to separate direction of travel along straight segments and allow bicyclists the flexibility to pass pedestrians and other slower travelers. Stripe a solid yellow centerline around curves to designate a "no passing" zone. Although the Path Level of Service tool indicates that a centerline (solid or dashed) affects cyclists' sense of freedom to maneuver and reduces their level of service, the dashed centerline is recommended due to the high volumes expected on the bridge. Furthermore, given the slower cycling speeds on the bridge and its limited length, the need to pass will not be as great as it would be on a path.

Alternative Two: Separated Bikeway

- Provide a five-foot raised walkway and two four-foot bicycle lanes, with one foot clear width between the bicycle lanes and the edge of the bridge, and a half-foot curb between the walkway and bicycle lanes, for a total width of 14.5 feet. The bicycle lanes would likely be used by all faster travelers (bicyclists, rollerbladers, skateboarders, and runners). This design is similar to that used on the I-80 Bicycle-Pedestrian Bridge in Berkeley.

- Stripe a solid white edge line one foot from any object (i.e. a fence or wall) along the sides of the bridge. Additional clear distance may be needed if fences protrude or curve in, or are not continuous. With a separated bikeway, no edge line is necessary on the sidewalk side.
- Stripe a dashed yellow centerline between the bicycle lanes to separate direction of travel along straight segments and allow bicyclists the flexibility to pass slower bicyclists. Stripe a solid yellow centerline around curves to designate a "no passing" zone.

General Design Recommendations

- On curved segments of the bridge, consider providing additional length on the landing, or width on the travelway to accommodate turning bicycles with trailers (see **Figure 5**).
- Ensure that any rail or fence along the bridge is designed such that it will not catch bicycle handlebars (for example, a "flatrail" is preferred over a round handrail). A bicycle (or shared bicycle-pedestrian) guardrail should be at least 4.5 feet high to protect bicyclists.⁸ A handrail for pedestrians should be at least 3.5 feet above the walkway.
- Provide stairs on both ends of the bridge for pedestrians, runners, and others to access the bridge most directly.
- Provide bicycle "troughs" in stairways so that bicyclists can roll their bikes up the stairs.
- Ensure that ramps have a maximum of 5 percent slope to accommodate wheelchair users.
- The ramps may be narrower than the main span of the bridge in locations where pedestrians would likely use the stairs instead of the ramps. While 8 feet is the minimum width, we recommend a total width of 12 feet between railings.
- Consider providing elevators as an alternative to the ramps, which are expected to be quite long.
- Provide a skid-resistant, yet relatively smooth surface for bicycles and wheelchairs.

Based on observations at the comparison facilities, the following additional items should be considered in the design and planning of the bridge:

- Consider access to sunlight, but also shelter from wind to provide a comfortable environment for bridge users.
- Consider ease of maintenance in the bridge design, so that glass and other debris can be easily cleaned from the bridge, ramps, and stairs.
- Provide pedestrian-scale lighting along the ramps, stairs, and bridge, as well as other features (e.g. clear sight lines from Ohlone Way and Horton Street, open feeling, call boxes) to enhance personal safety.

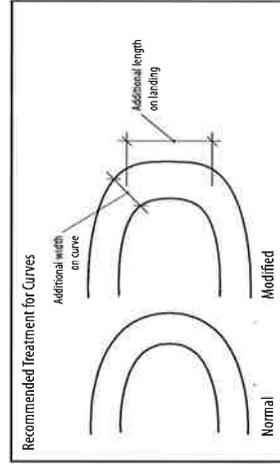
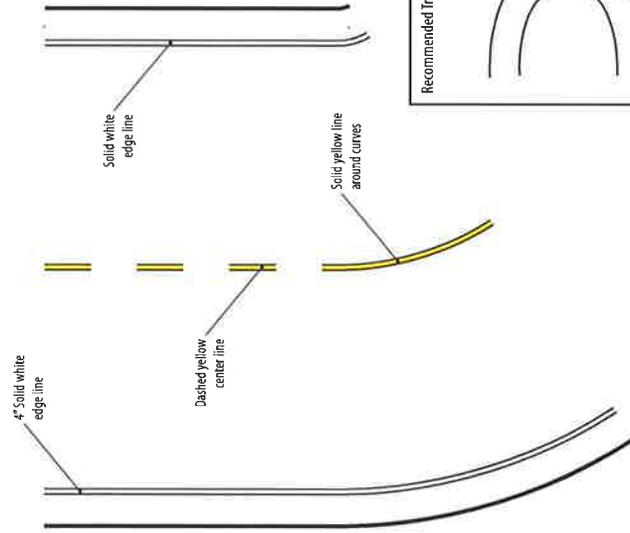
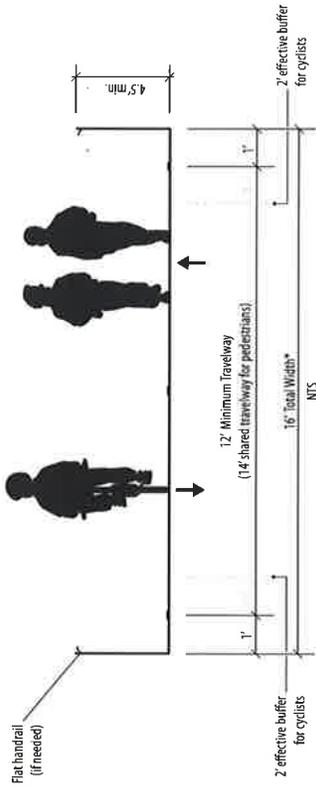
⁸ Caltrans *Highway Design Manual*, Chapter 200, page 39

- Provide signage at both ends of the bridge indicating potential destinations on the other side (including Bay Street, Powell Street Plaza, Bay Trail, Bay Bridge, Emeryville Marina, key business areas, and bike routes).
- Encourage the provision of bicycle parking (racks or covered storage) at destinations at both sides of the bridge (ie at Bay Street and on Horton Street) by the City or property owners.

The design recommendations are shown in **Figure 5**.

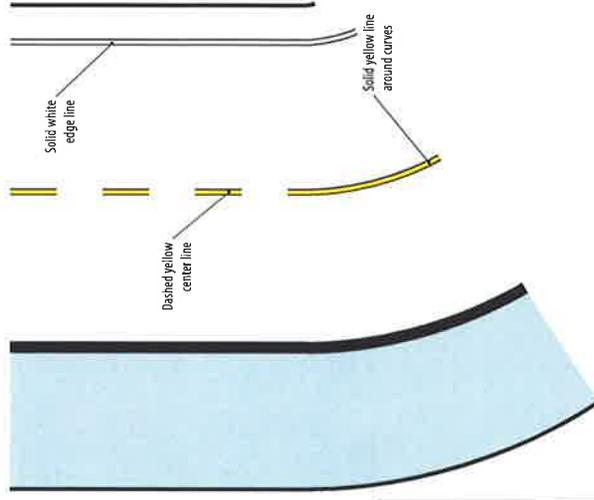
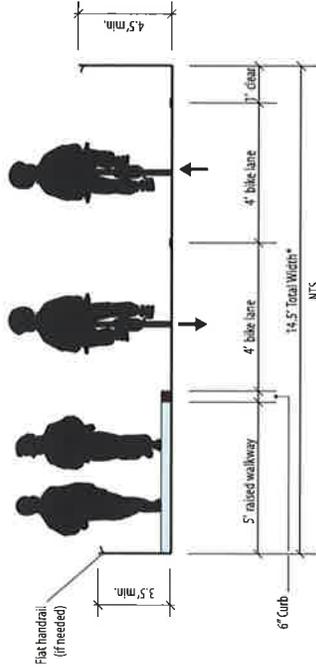
Please contact Emily Johnson at (925) 930-7100 if you have any questions or comments on this memorandum.

Alternative 1: Shared Travelway



*Note: Additional width should be considered around curves.

Alternative 2: Separated Bikeway



SOUTH BAYFRONT BRIDGE, EMERYVILLE



FEHR & PEERS
TRANSPORTATION CONSULTANTS

February 2008
WC07-2476_5

SOUTH BAYFRONT BRIDGE DESIGN RECOMMENDATIONS
FIGURE 5



Appendix A:

Comparison Facility Counts

Summary

		peak hour counts: user type by percentage												
Comparison Bridges	location	hour of observations	ped	adult-		bike		other users				TOTAL	% EB	% WB
				faster/riding	slower/walking	adult-walk	rollerbladers	skateboarders	runners					
1	1-80 Bridge	Berkeley Friday, October 26, 12:15-1:15 Saturday Oct 13, 12:30-1:30	6% 18%	29% 24%	32% 42%	0% 4%	0% 1%	0% 0%	0% 0%	32% 11%	31	52% 42%	48% 58%	
2	Amtrak bridge	Emeryville Friday, October 26, 12:15-1:15	98%	1%	1%	0%	0%	0%	0%	0%	269	53%	47%	
3	Powell Street bridge	Emeryville Friday, October 26, 12:30-1:30	0%	100%	0%	0%	0%	0%	0%	0%	4	50%	50%	
4	Powell St ped under-crossing	Emeryville Friday, October 26, 12:00-1:00	88%	0%	0%	0%	0%	0%	0%	12%	50	54%	46%	
5	40th Street overcrossing	Emeryville Friday, October 26, 12:30-1:30 Saturday Oct 13, 12:30-1:30	40% 44%	5% 31%	45% 19%	0% 6%	0% 0%	0% 0%	0% 0%	10% 0%	20 32	45% 53%	55% 47%	
6	65th Street at-grade crossing	Emeryville Friday, October 26, 12:30-1:30	83%	5%	4%	0%	0%	0%	0%	8%	120	52%	48%	

Saturday, Oct 13

Time Direction	11:30-11:45		11:45-12:00		12:00-12:15		12:15-12:30		12:30-12:45		12:45-1:00		1:00-1:15		1:15-1:30		TOTAL			
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	11:30-12:30	12:30-1:30	12:30-1:30	11:30-1:30 (2 hrs)
Pedestrians	1	1	3	2	2	2	1	6	3	1	3	1	2	3	3	3	8	18	18	43
Bicyclists: adult faster	1	4	1	6	3	3	4	3	3	1	5	2	5	2	3	5	17	17	26	43
Bicyclists: adult leisurely	7	2	9	3	2	3	4	9	5	8	8	4	8	4	8	39	35	43	81	
Bicyclists: child (under 13)	1	1	2	1	1	1	1	2	1	2	1	1	1	1	1	8	9	6	12	
Rollerbladers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
skateboarders	1	1	1	1	1	1	3	1	1	2	1	1	1	3	3	5	5	9	12	
runners	1	1	1	1	1	1	3	1	1	2	1	1	1	3	3	5	7	9	12	
other:	11	10	19	5	11	13	4	3	14	21	12	12	15	10	20	76	90	90	109	
TOTAL	11	10	19	5	11	13	4	3	14	21	12	12	15	10	20	76	90	90	109	185

EB	46	42%
WB	63	58%

name Ellen Robinson
 location east side of span
 weather sunny & warm
 anything unusual? no
 notes no

Friday, Oct 26

Time Direction	11:30-11:45		11:45-12:00		12:00-12:15		12:15-12:30		12:30-12:45		12:45-1:00		1:00-1:15		1:15-1:30		TOTAL			
	EB	WB	EB	WB	EB	WB	EB	WB	11:30-12:30	12:30-1:30	12:30-1:30	11:30-1:30 (2 hrs)								
Pedestrians	1	1	1	1	1	1	2	2	1	2	2	1	2	2	2	2	5	4	2	9
Bicyclists: adult faster	2	1	2	2	2	2	2	2	1	2	2	2	2	1	1	2	12	12	6	15
Bicyclists: adult leisurely	1	2	2	2	1	3	1	1	2	2	1	1	3	1	2	12	12	10	24	
Bicyclists: child (under 13)	1	1	1	1	1	1	3	2	2	1	2	2	2	2	2	4	4	8	11	
Rollerbladers	1	1	1	1	1	1	3	2	2	1	2	1	2	2	2	4	4	8	7	
skateboarders	1	1	1	1	1	1	3	2	2	1	2	2	2	2	2	4	6	8	10	
runners	1	1	1	1	1	1	3	2	2	1	2	2	2	2	2	4	6	8	10	
other:	3	4	3	4	2	4	5	5	3	4	3	3	5	3	4	30	30	29	31	
TOTAL	3	4	3	4	2	4	5	5	3	4	3	3	5	3	4	30	30	29	31	59

EB	16	52%
WB	15	48%

name Ellen Robinson
 location west side of bridge (top of ramp)
 weather sunny, windy, 60 degrees
 anything unusual? no

Amtrak Bridge

Friday, Oct 26

Time	11:30-11:45		11:45-12:00		12:00-12:15		12:15-12:30		12:30-12:45		12:45-1:00		1:00-1:15		1:15-1:30		TOTAL				
	EB	WB	EB	WB	EB	WB	EB	WB	11:30-12:30	12:00-1:00	12:15-1:30	11:30-1:30 (2 hrs)									
Pedestrians	7	12	14	27	17	36	20	31	45	42	40	29	35	22	30	17	424	260	264	260	424
Bicyclists: adult riding bike					1	1						1		1			2	3	2	2	4
Bicyclists: adult walking bike							1			1								3	3	2	3
Bicyclists: child (under 13)																	0	0	0	0	0
Rollerbladers																	0	0	0	0	0
skateboarders																	0	0	0	0	0
runners				1													0	0	0	0	0
other:	1																1	0	0	0	1
TOTAL	8	12	14	28	18	37	21	31	45	43	41	30	35	23	30	17	169	237	266	269	433
took elevator	2	0	6	0	3	13	7	1	4	5	3	7	2	1	2	1	32	39	43	25	57
% using elevator	25%	0%	43%	0%	17%	35%	33%	3%	9%	12%	7%	23%	6%	4%	7%	6%	19%	16%	16%	9%	13%

name
location
weather
anything
unusual?
notes

Danny Yost
Amtrak
sunny, partly cloudy, windy, cold
no
those noted for elevator use used one or both elevators; all but 1 cyclist used elevator; smaller percentage of peds used it
west elevator and stairway needs cleaning- smells disgusting (vomit 6 months ago one man said)
the vast majority (80% or more) were going to lunch/walk during lunch
the sidewalk east of the railroad tracks was used to get from offices to the bridge
there was so much use largely because of proximity to the Public Market
elevator use ranged from 9 to 19% in each hour-long interval, with an average of 11%

EB 142 53%
WB 127 47%

Powell Street bridge

Friday, Oct 26

Time Direction	11:30-11:45		12:00-12:15		12:15-12:30		12:30-12:45		12:45-1:00		1:00-1:15		1:15-1:30		TOTAL		11:30- 1:30 (2 hrs)	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB		
Pedestrians	1																	0
Bicyclist: adult faster			1															0
Bicyclist: adult leisurely							1											6
Bicyclist: child (under 13)																		0
Rollerbladers																		0
Skateboarders																		0
runners																		0
other:																		0
TOTAL	1	0	0	0	0	0	1	0	0	0	1	0	1	1	2	2	4	6

name: Matt Plumb
 location: stood at NW corner of Powell/Christie (looking east to Powell St overcrossing)

weather: no
 unusual?: wheelchair wanted to cross EB at 11:30 but couldn't
 notes: no striped bike lane

EB 2
 WB 2
 50%
 50%

Pow

TOTAL						
	11:30-12:30	11:45-12:45	12:00-1:00	12:15-1:15	12:30-1:30	11:30-1:30 (2 hrs)
Ped	61	30	44	42	41	61
Bicy						
fast	0	0	0	0	0	0
Bicy						
leist	0	0	0	0	0	0
Bicy						
(unc	0	0	0	0	0	0
Roll	0	0	0	0	0	0
skat	1	0	0	0	0	1
runr	1	4	6	5	6	7
othe	0	0	0	0	0	0
TOT	22	34	50	47	47	69

cross
direi
% ci

EB	27	54%
WB	23	46%

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note

40th Street over-riding

Saturday, Oct 13

Time Direction	11:30-11:45		11:45-12:00		12:00-12:15		12:15-12:30		12:30-12:45		12:45-1:00		1:00-1:15		1:15-1:30		TOTAL		11:30-1:30 (2 hrs)			
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB										
Pedestrians	2	5	3	1	2	3	2	1	1	2	1	1	4	2	3	1	19	14	13	14	30	
Bicyclists: adult faster	1		4		1		1		3		1		1		1		4	6	9	10	14	
Bicyclists: adult leisurely							3		1		1		1		1		8	8	5	7	14	
Bicyclists: child (under 13)										1	1						0	1	2	2	2	
Rollerbladers																	0	0	0	0	0	
skateboarders																	0	0	0	0	0	
runners																	0	0	0	0	0	
other:																	0	0	0	0	0	
TOTAL	3	5	7	3	3	3	2	5	6	3	6	0	6	3	5	3	28	29	28	31	32	60

name Jamie henson
 location base of bridge at 40th & Hubbard
 weather sunny, 70 degrees, light breeze
 anything no
 unusual?
 notes

EB 17 55%
 WB 15 47%

Friday, Oct 26

Time Direction	11:30-11:45		11:45-12:00		12:00-12:15		12:15-12:30		12:30-12:45		12:45-1:00		1:00-1:15		1:15-1:30		TOTAL		11:30-1:30 (2 hrs)		
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB									
Pedestrians	3		1		1								2	2	2	5	2	3	6	8	13
Bicyclists: adult faster/rec													1			2	2	0	1	1	3
Bicyclists: adult leisurely/commute			2		1		2		2	1						5	7	8	7	9	14
Bicyclists: child (under 13)																0	0	0	0	0	0
Rollerbladers																0	0	0	0	0	0
skateboarders																0	0	0	0	0	0
runners																2	2	2	1	2	4
other:																0	0	0	0	0	0
TOTAL	0	3	3	1	2	2	2	1	0	2	4	1	3	2	2	14	13	13	15	20	34

name Jamie henson
 location
 weather sunny, 60+ degrees, light breeze
 anything
 unusual?
 notes

EB 9 45%
 WB 11 55%

65th Street xing

Friday, Oct 26

Time Direction	11:30-11:45		11:45-12:00		12:00-12:15		12:15-12:30		12:30-12:45		12:45-1:00		1:00-1:15		1:15-1:30		TOTAL		11:30- 1:30 (2 hrs) 160			
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB				
Pedestrians:	2	13	15	4	11	5	2	8	22	11	7	7	14	7	9	23	160	78	100			
Bicyclists: adult		1					1	1	1	1	1	1	1		1		3	4	6			
Bicyclists: child																	2	4	5			
Rollerbladers																	0	0	0			
skateboarders																	0	0	0			
runners																	0	0	0			
other:									1	4			3		1		0	5	8			
TOTAL	2	14	16	4	12	5	3	9	24	15	8	9	18	7	12	26	65	89	86	94	120	185

name Mark Feldman
 location 65th Street railroad crossing (near Shellmound)
 weather mostly clear, 65 degrees

notes sometimes peds cross along the tracks, even though there's a crosswalk 20 ft to the west. (see drawing on count form)
 there are 'no ped xing' signs on the northeast corner, but a few peds cross there anyway. Peds can cross railroad on south side of 65th only
 bike lanes on south side of 65th St east of Overland (not part of this intersection)
 bikes lanes on Shellmound

EB 62 52%
 WB 56 48%



Appendix B:

Comparison Facility Land Use

ID	stories	name	status	type	area	estimated square feet	estimated employees/residents	
retail								
719	1	EmeryBay Marketplace, Theatre & Tower	Complete	RETAIL	1 story, multiple units	43273	43273	87
Industrial								
1183	1			HEAVY IND		2466	2466	5
22	2			LIGHT IND		8896	17792	36
1114	2			LIGHT IND		6801	13602	27
1096	2			LIGHT IND	known s.f.	28959	57919	116
25	2			LIGHT IND		7626	15252	31
746	2			LIGHT IND		14053	28107	56
136	1			LIGHT IND	1 story, multiple units	37107	37107	74
1176	1			LIGHT IND	1 story, multiple units	14582	14582	29
1175	2			LIGHT IND		4408	8816	18
66	999			LIGHT IND	none	6978	0	0
1173	1			LIGHT IND		11308	11308	23
1207	1			LIGHT IND		33095	33095	66
1200	1			LIGHT IND		14355	14355	29
1178	1			LIGHT IND		20093	20093	40
4	1			LIGHT IND		13460	13460	27
1193	1			LIGHT IND		11041	11041	22
1212	2			LIGHT IND	1 story, 1 unit	2534	5068	10
1181	1			LIGHT IND	1 story, multiple units	2278	2278	5
742	2			LIGHT IND	known s.f.	3196	6392	13
1208	1			LIGHT IND		14630	14630	29
1209	1			LIGHT IND		13114	13114	26
1197	1			LIGHT IND		14228	14228	28
1196	1			LIGHT IND		14457	14457	29
1195	1			LIGHT IND		5868	5868	12
1194	1			LIGHT IND		4618	4618	9
1199	1			LIGHT IND		14546	14546	29
1198	1			LIGHT IND		14074	14074	28
1210	1			LIGHT IND		14447	14447	29
1211	1			LIGHT IND		14611	14611	29
747	2			LIGHT IND		19293	38585	77
1192	2			LIGHT IND	known s.f.	1185	2371	5
17	2			LIGHT IND		8752	17505	35
16	2			LIGHT IND		7331	14662	29
735	2			LIGHT IND		7310	14620	29
29	2			LIGHT IND		5406	10811	22
23	2			LIGHT IND		2235	4471	9
1174	1			LIGHT IND		1796	1796	4
1180	1			LIGHT IND		10692	10692	21
1179	1			LIGHT IND		9761	9761	20
1213	1			LIGHT IND		1439	1439	3
office								
30	1	Emery Bay	Complete	MIXED USE	1 story, multiple units	121873	121873	443
12	3	Emery Tech (Grove Valve)	Complete	OFFICE		139706	419118	1524
97	3	Bay Center Offices	Complete	OFFICE	1 story, 1 unit	27383	82148	299
135	5	Bay Center Offices	Complete	OFFICE	known s.f.	24677	123383	449
54	5	Bay Center Offices	Complete	OFFICE	1 story, 1 unit	24322	121608	442
102	2	Hollis Business Center	Complete	OFFICE	3D building model available	37598	75196	273
101	2	Hollis Business Center	Complete	OFFICE	3D building model available	32299	64598	235
77	2	Hollis Business Center	Complete	OFFICE	3D building model available	118553	237105	862
1103	1			OFFICE	1 story, multiple units	27792	27792	101
84	1			OFFICE	1 story, multiple units	2026	2026	7
1113	2			OFFICE		11380	22760	83
49	1			OFFICE	1 story, multiple units	4783	4783	17
78	2			OFFICE	1 story, 1 unit	1980	3960	14
public								
1151	2			PUBLIC/INSTIT		3638	7276	7
141	2			PUBLIC/INSTIT		8276	16553	17
Non-Residential subtotal								5989
residential							units (avg)	residents
109	6	EmeryBay Club & Apartments I & II	Complete	RES: 60 - 75		31237	67.5	115
110	6	EmeryBay Club & Apartments I & II	Complete	RES: 60 - 75		47744	67.5	115
56	6	EmeryBay Club & Apartments I & II	Complete	RES: 60 - 75		20003	67.5	115
57	6	EmeryBay Club & Apartments I & II	Complete	RES: 60 - 75		27094	67.5	115
60	6	EmeryBay Club & Apartments I & II	Complete	RES: 60 - 75		13272	67.5	115
61	6	EmeryBay Club & Apartments I & II	Complete	RES: 60 - 75		20510	67.5	115
55	6	EmeryBay Club & Apartments I & II	Complete	RES: 60 - 75		21039	67.5	115
1112	1	The Courtyards at 65th Street		RES: 60 - 75		9879	none (parking)	
90	1	The Courtyards at 65th Street		RES: 60 - 75		29363	67.5	115
Residential subtotal								923

stories	name	status	type	area	notes	estimated square feet	estimated employees/residents	
office								
2	Heritage Square	Complete	OFFICE	78300		156601	569	
5	Emery Station 1 & North (Westinghouse)	Complete	OFFICE	37393		186963	680	
2	5900 Hollis	Complete	OFFICE	64373	1 story, multiple units	128746	468	
1			OFFICE	12008	1 story, multiple units	12008	44	
1			OFFICE	20616		20616	75	
1			OFFICE	14763	1 story, multiple units	14763	54	
5			OFFICE	9556	1 story, 1 unit	47778	174	
5			OFFICE	63930	known s.f.	319649	1162	
2			OFFICE	4994		9988	36	
4		C	Office	4949	CH observation	19797	72	
4		C	Office	4846	CH observation	19363	70	
3		C	Office	3047	CH observation	9141	33	
retail								
1			COM	6485		6485	13	
1			COM	7281	1 story, multiple units	7281	15	
1	Heritage Square	Complete	RETAIL	8287	Mixed Use - No Residential	8287	17	
2	Heritage Square	Complete	RETAIL	5202	Mixed Use - No Residential	10404	21	
1	EmeryBay Marketplace, Theatre & Tower	Complete	RETAIL	43273	1 story, multiple units	43273	87	
2	EmeryBay Marketplace, Theatre & Tower	Complete	RETAIL	83284		166568	333	
2	Heritage Square	Complete	RETAIL	3066	Light Industrial	6132	12	
8	EmeryBay Marketplace, Theatre & Tower	Complete	RETAIL	16889	Retail	135111	270	
industrial								
3			LIGHT IND	61893		185678	371	
2			LIGHT IND	10772	1 story, 1 unit	21545	43	
1			LIGHT IND	33379	1 story, multiple units	33379	67	
2			LIGHT IND	11383	1 story, multiple units	22766	46	
2			LIGHT IND	6561		13122	26	
1			LIGHT IND	2120	1 story, multiple units	2120	4	
2			LIGHT IND	7959		15917	32	
2			LIGHT IND	6741		13483	27	
1			LIGHT IND	13556	1 story, multiple units	13556	27	
1			LIGHT IND	37107	1 story, multiple units	37107	74	
public								
2	Post Office	Complete	PUBLIC/INSTIT	22642		45284	45	
1	Amtrak Station		PUBLIC/INSTIT	11132	1 story, multiple units	11132	11	
2			PUBLIC/INSTIT	3638		7276	7	
other								
7			HOTEL	10725	known s.f.	75073	138	
1			MIXED USE	2713		2713	7	
1		C	Hotel	34134		34134		
12		C	Hotel	34134		409608	211	
Non-residential subtotal							5341	
residential						units (avg)	residents	
2	Christie Avenue Commons	Complete	LIVE WORK: 20 - 45	30868		33	56	
2	Christie Avenue Commons	Complete	LIVE WORK: 20 - 45	17972	1 story, 1 unit	33	56	
2	Christie Avenue Commons	Complete	LIVE WORK: 20 - 45	12118	1 story, 1 unit	33	56	
3	Elevation 22	Complete	RES: 20 - 45	3059	3D building model available	33	56	
3	Elevation 22	Complete	RES: 20 - 45	3528	3D building model available	33	56	
8	Terraces at Emery Station	Complete	RES:45 - 60	56767		53	90	
2			RES:45 - 60	79983	known s.f.	53	90	
2			RES:45 - 60	36436	known s.f.	53	90	
Residential subtotal							547	

Powell Street

ID	stories	name	status	type	area	notes	estimated square feet	estimated employees/residents
retail								
814	1			COM			6485	13
684	1			COM	1 story, multiple units	Retail	7281	15
268	1	Heritage Square	Complete	RETAIL		Mixed Use - No Residential	8287	17
267	2	Heritage Square	Complete	RETAIL		Mixed Use - No Residential	10404	21
836	1	Powell Street Plaza	Complete	RETAIL		Retail	10733	21
690	1	Powell Street Plaza	Complete	RETAIL	1 story, multiple units	Retail	27937	56
835	1	Powell Street Plaza	Complete	RETAIL	1 story, multiple units	Retail	3286	7
760	2	Heritage Square	Complete	RETAIL		Light Industrial	6132	12
249	8	EmeryBay Marketplace, Theatre & Tower	Complete	RETAIL		Retail	16889	270
other								
787	7			HOTEL	known s.f.	Hotel	10725	138
14	1					Hotel	34134	34134
13	12					Hotel	34134	408608
815	1			MIXED USE		Mixed Use - No Residential	2713	7
industrial								
401	3			LIGHT IND		Light Industrial	61893	185678
392	2			LIGHT IND	1 story, 1 unit	Light Industrial	10772	21545
1091	1			LIGHT IND	1 story, multiple units	Light Industrial	33379	33379
1106	2			LIGHT IND	1 story, multiple units	Light Industrial	11383	22766
1130	2			LIGHT IND		Light Industrial	6561	13122
159	1			LIGHT IND	1 story, multiple units	Light Industrial	2120	2120
1204	2			LIGHT IND		Light Industrial	7959	15917
1129	2			LIGHT IND		Light Industrial	6741	13483
1201	1			LIGHT IND	1 story, multiple units	Light Industrial	13556	13556
773	1			LIGHT IND	1 story, multiple units	Light Industrial	45137	45137
office								
261	5	Emery Station 1 & North (Westinghouse)	Complete	OFFICE		Office	37393	188863
764	1			OFFICE		Office	20616	20616
279	1			OFFICE	1 story, multiple units	Office	14763	14763
357	5			OFFICE	1 story, 1 unit	Office	9556	47778
337	5			OFFICE	known s.f.	Office	63930	319649
768	2			OFFICE		Office	4994	9988
782	1			OFFICE	1 story, multiple units	Office	14854	14854
262	4					Office	4949	19797
264	4					Office	4846	19383
263	3					Office	3047	9141
public								
732	2	Post Office	Complete	PUBLIC/INSTIT		Public	22642	45284
1220	2			PUBLIC/INSTIT	1 story, multiple units	Public	46592	93184
1202	1	Amtrak Station		PUBLIC/INSTIT	1 story, multiple units	Public	11132	11132
Non-residential subtotal								4080
residential								
246	2	Christie Avenue Commons	Complete	LIVE WORK: 20 - 45	1 story, 1 unit	Residential	17972	32.5
359	999	Elevation 22	Complete	RES: 20 - 45	3D building model available	Residential	3059	32.5
360	999	Elevation 22	Complete	RES: 20 - 45	3D building model available	Residential	3528	32.5
716	8	Terraces at Emery Station	Complete	RES:45 - 60		Public	56767	52.5
Residential subtotal								257

<i>ID</i>	<i>stories</i>	<i>name</i>	<i>status</i>	<i>type</i>	<i>area</i>	<i>estimated square feet</i>	<i>estimated employees/residents</i>
office							
366	3	Emeryville Warehouse Lofts	Complete	OFFICE	7043	21129	77
1037	1			OFFICE	7543	7543	27
1039	2			OFFICE	16213	32425	118
industrial							
1136	2			HEAVY IND	14588	29176	58
582	2			LIGHT IND	3039	6078	12
1032	2			LIGHT IND	9183	18366	37
198	2			LIGHT IND	20142	40284	81
945	1			LIGHT IND	15127	15127	30
943	1			LIGHT IND	34226	34226	68
193	1			LIGHT IND	9658	9658	19
944	2			LIGHT IND	23955	47910	96
195	2			LIGHT IND	15660	31320	63
196	1			LIGHT IND	3720	3720	7
204	1			LIGHT IND	6082	6082	12
197	1			LIGHT IND	1660	1660	3
194	1			LIGHT IND	687	687	1
199	1			LIGHT IND	14433	14433	29
1036	1			LIGHT IND	3392	3392	7
200	1			LIGHT IND	2893	2893	6
1095	3			LIGHT IND	3356	10068	20
1094	3			LIGHT IND	2594	7781	16
1	2			Industrial	29831	59662	119
1137	2			Light Industrial	1151	2303	5
Non-residential subtotal							912
residential						units (avg)	residents
1016	3	Emeryville Warehouse Lofts	Complete	LIVE WORK: 20 - 45	6349	32.5	56
1163	3	Emeryville Warehouse Lofts	Complete	LIVE WORK: 20 - 45	18465	32.5	56
1017	3	Emeryville Warehouse Lofts	Complete	LIVE WORK: 20 - 45	16117	32.5	56
1093	3			LIVE WORK: 20 - 45	3829	32.5	56
1038	3			LIVE WORK: 20 - 45	2836	32.5	56
Residential subtotal							278

South Bayfront

ID	stories	name	status	type	area	notes	estimated square feet	estimated employees/residents	exists in future?
Existing									
other									
1148	10	Marriott Hotel Bay Street	Complete	HOTEL cinema	27753	Hotel (295 rooms) 16 screens	277526	266 83	Y Y
industrial									
1130	2			LIGHT IND	6561	Light Industrial	13122	26	Y
159	1			LIGHT IND	2120	Light Industrial	2120	4	Y
1204	2			LIGHT IND	7959	Light Industrial	15917	32	Y
300	1	PG & E		LIGHT IND	25783	Light Industrial	25783	52	Y
299	2	PG & E		LIGHT IND	17918	Light Industrial	35835	72	Y
298	2	PG & E		LIGHT IND	9609	Light Industrial	19217	38	Y
1128	2	Chiron	Partially	R & D	15205	R & D	30409	61	Y
723	2	Chiron	Partially	OPEN SPACE	13054	R & D	26108	52	Y
724	2	Chiron	Partially	OPEN SPACE	30754	R & D	61507	123	Y
407	4	Chiron	Partially	R & D	20770	R & D	83081	166	Y
229	6	Chiron	Partially	R & D	71411	R & D	428466	857	Y
406	3	Chiron	Partially	R & D	21896	R & D	65667	131	Y
433	5	Chiron	Partially	R & D	32777	R & D	163886	328	Y
431	5	Chiron	Partially	R & D	5185	R & D	25926	52	Y
432	5	Chiron	Partially	R & D	25929	R & D	129645	259	Y
809	1	Chiron	Partially	R & D	2489	R & D	2489	5	Y
808	2	Chiron	Partially	R & D	4551	R & D	9103	18	Y
1135	1			R & D	5495	R & D	5495	11	Y
927	4			R & D	7777	R & D	31109	62	Y
589	4			R & D	25745	R & D	102980	206	Y
590	4			R & D	2999	R & D	11994	24	Y
public									
1220	2			PUBLIC/INSTIT	46592	Public	93184	93	Y
retail									
514	1	Powell Street Plaza	Complete	RETAIL	33981	Retail	33981	68	Y
835	1	Powell Street Plaza Bay Street	Complete	RETAIL	3286	Retail	3286	7	Y
			Complete	RETAIL			325000	650	Y
Non-residential subtotal								3746	
residential									
1163	3	Emeryville Warehouse Lofts	Complete	LIVE WORK: 20 - 45	18465	Mixed Use - With Residential	units (avg) 33	residents 56	Y
658	2	Horton Street Lofts Bay Street		LIVE WORK: 20 - 45 Apts/Condos	24421	Residential	33	56	Y
							379	648	Y
Residential subtotal								759	
Planned/in Progress									
other									
715	7	Bay Street Housing	Under Cons	MIXED USE	146983	Mixed Use - No Residential	1028883	(see above)	
293	4	Bay Street Housing	Under Cons	MIXED USE	39076	Mixed Use - No Residential	156306	(see above)	
843	3	Bay Street Housing	Under Cons	MIXED USE	140086	Mixed Use - No Residential	420257	(see above)	
412	4	Bay Street Housing	Under Cons	MIXED USE	41691	Mixed Use - No Residential	166764	(see above)	
1066	2	South Bayfront Site B	Potential	MIXED USE	6475	Hotel (150 rooms)	12950	135	
1219	2	South Bayfront Site B			13950	Mixed Use - No Residential	27900	(see retail below)	
815	1	South Bayfront Site B			2713	Mixed Use - No Residential	2713	(see residential below)	
641	2	Bay Street Housing	Under Cons	MIXED USE	44594	Mixed Use - No Residential	89189	(see above)	
office									
367	3	Sherwin Williams	Potential	HEAVY IND	31190	Office	127000	462	
retail									
920	3	South Bayfront Site B Sherwin Williams	Potential	retail HEAVY IND		Retail--80-139 ksf	109500	219	
					24782	Retail	50000	100	
industrial									
1005	2	Marks Warehouse	Potential	LIGHT IND	6786	Industrial	13572	27	
648	2	PG&E	Potential	R & D	28257	Light Industrial	56513	113	
649	2	PG&E	Potential	R & D	13887	R & D	27773	56	
650	2	PG&E	Potential	R & D	1200	Residential	2401	5	
651	2	PG&E	Potential	R & D	968	Residential	1937	4	
Non-residential subtotal								1120	
residential									
654	2	PG&E	Potential	LIVE WORK: 45 - 60	43501	Residential	Units (avg) 53	residents 90	
655	2	PG&E	Potential	LIVE WORK: 45 - 60	1418	Residential	53	90	
924	1	South Bayfront Site B Sherwin Williams	Potential	Residential: 140-240 DU	86021	Residential (140-240 DU)	190	325	
			Potential	HEAVY IND		Residential	435	744	
Residential subtotal								1248	
Existing Plus Future									
Non-residential Total								4866	
Residential Total								2008	

