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# Memorandum

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| To | Val Menotti, Sadie Mitchell<br>San Francisco Bay Area Rapid Transit District |
| Pages | 22 |
| CC | |
| Subject | 19th Street Oakland Station – Data Collection and Assessment Memorandum (Revised) |
| From | Bill Burton, PE<br>Ryan Park, PE PTP<br>Anthony Mangonon |
| Date | August 26, 2013 |

This memorandum summarizes the data collection efforts as described under Task 1 of the Scope of Services for WP-07 (19th Street Oakland Station Conceptual Design Plan).

## Station Walk-through

On Tuesday, June 18, 2013, AECOM attended a station walk-through hosted by BART to identify issues related to renovation needs, station capacity, sustainability, wayfinding, Americans with Disabilities Act (ADA) improvements, station access, land use forecasts, and local transit improvements. AECOM's understanding of these topics is summarized in the following subsections, with additional details available in the "Early Wins" site assessment and walk-through meeting notes previously submitted to BART.

### Renovation Needs

The walk-through identified renovation needs throughout the station at both concourse and platform levels, including platform benches, floor tiles, wall cladding, lighting, trash receptacles, paid-area barriers, public announcement (PA) systems, security / closed circuit television (CCTV) systems, and advertising. Other suggested improvements included removal of obsolete or redundant equipment (e.g., AC Transit transfer dispensers, public telephones) and general cleaning and repair (particularly with respect to water seepage), as well as potential measures to discourage fare evasion (particularly at the South Booth), urination and crime. Potential opportunities for public art, such as station entrances and platforms, were also identified, together with possible coordination efforts with local businesses. BART staff also noted that a pilot project to install a canopy at the station entrance at the northeast corner of Broadway / 19th Street was also underway.

### Station Capacity

The walk-through identified capacity constraints related to passenger egress at the station entrance at the northeast corner of Broadway / 19th Street, with potential solutions including widening to allow for double-width (44 in) escalators, increased escalator speed, or additional portals along Broadway or at 400 20th Street (California Bank & Trust).

At concourse level, BART staff noted existing capacity constraints related to passenger flows exiting the station through the northeast faregate array, where there is concentrated queuing at both the faregates and free area vertical circulation facilities. BART staff also identified potential capacity improvements to the lower platform level, including new alcoves to increase circulation and queuing space (similar to the plan

described for 12th Street Oakland City Center Station under the BART Metro effort) and full build-out of the station box to include a fourth track.

Wayfinding

The walk-through also identified areas for improvement in existing wayfinding systems, including expansion of floor decals for passenger queuing and bike waiting areas, replacement of makeshift signage with permanent solutions, and better maintenance of information kiosks and displays. BART staff noted that signage and wayfinding improvements at the station were already in the design phase and also suggested potentially renaming the station to simplify the name and enhance station and neighborhood identity.

Sustainability

Walk-through attendees recommended conversion of lighting systems to more energy-efficient LED installations as part of general improvements to the station's lighting systems. BART staff also suggested potential integrated lighting / signage solutions, such as high-luminosity station lighting combined with unlit, low-maintenance signage.

ADA Improvements

The walk-through identified the need for improved signage at the platform-access elevator, which is currently not ADA-compliant.

Station Access

City of Oakland staff expressed concern about insufficient sidewalk capacity along the north side of 20th Street, east of the station entrance. In particular, the effective width of the sidewalk is narrowed as a result of a variety of obstructions including bus stop benches and poles, street trees and landscaping, pavement treatments such as cobbles, and other features. There is also high potential for conflict between pedestrian flows entering and exiting the station, private automobile and shuttle pick-up and drop-off activities, and bicycle parking and circulation. As a result, pedestrian flow is often disrupted on these sections of sidewalk, and conditions are exacerbated during the weekday AM peak hour as a result of platooning, as passengers attempt to exit the station at this location in "pulses" following the arrival of each train at platform level. "Complete Streets" improvements would include a redesign of 20th Street from Lake Merritt to the Uptown Transit Hub (Lakeside Drive to San Pablo Avenue), including a road diet (conversion to a two-lane roadway), new bike lanes, and sidewalk widening.

Other station access improvements include beautification and urban design improvements at the station's southwest entrance in the alley connecting Broadway and Telegraph Avenue between 17th Street and 19th Street; improvements along the Telegraph Avenue corridor; new traffic signals and pedestrian crossings along San Pablo Avenue; pedestrianization of Latham Square; and the Measure DD / Lakeside Green Streets (Snow Park) Public Art project. BART staff also noted that efforts were already underway in coordination with the City of Oakland on establishing a new bike station in the ground floor of 1970 Broadway.

Land Use Forecasts

City of Oakland staff identified specific development projects expected to come online in the neighborhoods surrounding the station, including redevelopment projects at 1955 Broadway (Sears), 300 Lakeside Drive (Kaiser Center), and other locations, as well as the Broadway / Valdez District Specific Plan. Potential land

use development in the area surrounding the station is discussed in more detail in later sections of this memorandum.

Local Transit Improvements

City of Oakland staff noted that studies are currently underway to evaluate a possible extension of the "Free B" Broadway Shuttle north to MacArthur BART Station, as well as potential replacement of the shuttle with a fixed-rail system such as a streetcar. Integration opportunities were also identified with station canopy designs for the proposed Bus Rapid Transit (BRT) alignment along Broadway.

Ridership

BART staff provided AECOM with weekday daily, AM peak hour (8:00 AM to 9:00 AM), and PM peak hour (5:30 PM to 6:30 PM) ridership projections from BART's Direct Ridership Model (BRM) for a horizon year of 2040, summarized in station-by-station origin-destination (OD) matrices. As confirmed by BART staff, the land use inputs assumed in this ridership data are based on the land use element of the Plan Bay Area Preferred (Staff-Recommended) Alternative (i.e., the "Jobs–Housing Connection Strategy").

In order to determine the exact land use assumptions for neighborhoods surrounding 19th Street Oakland Station, AECOM contacted Metropolitan Transportation Commission (MTC) staff and obtained the Plan Bay Area Preferred Alternative land use and socioeconomic inputs for 2040 used in the MTC travel demand model. These data provide the following information for each of the 1,454 travel analysis zones (TAZs) in the nine-county Bay Area:

- Total (residential) population and total households; and,
- Total employment by industry (based on the North American Industry Classification System (NAICS).

By focusing on select TAZs encompassing the station's catchment area, AECOM can then compare the forecasted household and employment data against specific and foreseeable future development projects expected to be built-out within the horizon year of 2040. Although the development assumptions contained in the Plan Bay Area Preferred Alternative are generally considered aggressive, the goal of this comparison was to confirm whether or not the ridership forecasts provided by BART accounted for all pipeline development expected around the station.

The following TAZs, illustrated in Figure 1, were identified as those likely to contribute the majority of future ridership growth at the station attributable to new development:[(1)]

- TAZ 945 (Lake Merritt / Lakeside)
- TAZ 970 (Uptown) TAZ 971 (Broadway East / Lakeside)
- TAZ 972 (Valdez Triangle / Oakland–Harrison)
- TAZ 979 (Northgate–Waverly / Pill Hill)

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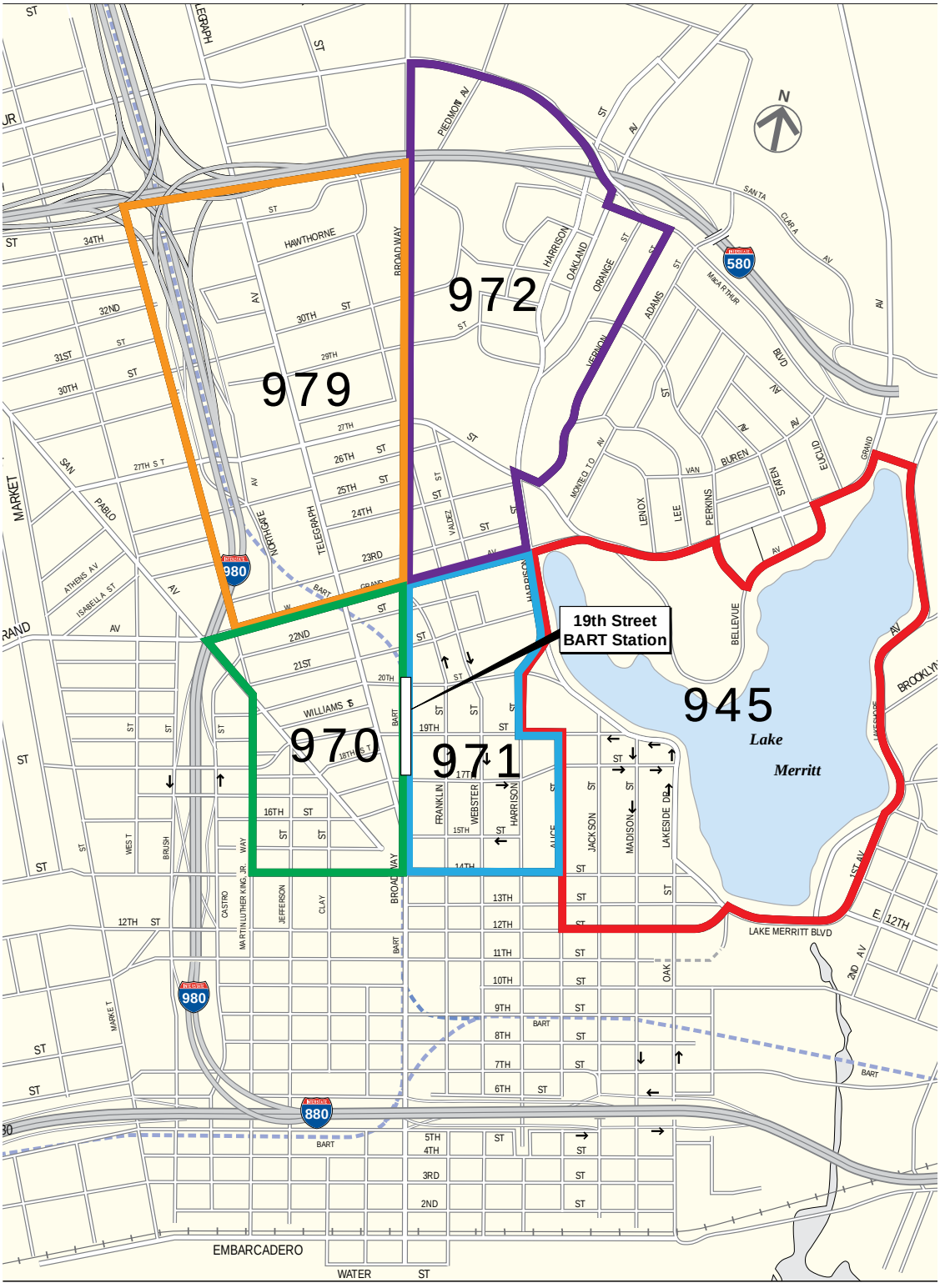
(1) A map of the TAZs assumed in the MTC travel demand model is available from the MTC website at http://www.mtc.ca.gov/maps_and_data/GIS/maps/TAZ1454doormap.pdf

Figure 1: TAZ Map



Land Use

In order to determine the foreseeable development potential for the TAZs, AECOM identified specific pipeline land use developments in the neighborhoods contained within these five TAZs, based on information provided by staff from the City of Oakland's Office of Neighborhood Investment and projects described in the City's List of Major Development Projects (current as of May 2013).[2] The identified pipeline developments, along with the proposed land use programs and locations, are summarized in Table 1.

AECOM compiled this data (the "pipeline developments") at the TAZ level and compared it against the land use growth assumed under the Plan Bay Area Preferred Alternative between 2015 and 2040 (the "forecasted development potential"). The results of that comparison are summarized in Table 2.

As shown in Table 2, the forecasted development potential for the five TAZs within the immediate catchment area of the station is substantially larger than the pipeline developments, particularly with respect to residential development (over twice the pipeline developments). The margin is smaller for employment growth, but the forecasted potential is still larger than the pipeline developments. While the latter are higher for some TAZs (namely, TAZ 927 and TAZ 979, which contain the Broadway / Valdez Specific Plan), these differences are balanced by substantially lower development in the remaining TAZs. As travel demand models generally do not consider each foreseeable project explicitly and instead assign growth to general areas of each local jurisdiction, differences at the TAZ level are generally considered negligible; instead, growth is usually compared by aggregating contiguous TAZs, as this gives a more balanced picture of the model's land use assumptions.

[2] The List of Major Development Projects can be accessed through the City of Oakland's Planning and Building Department website at http://www2.oaklandnet.com/Government/o/PBN/OurOrganization/PlanningZoning/index.htm

Table 1: Pipeline Developments

| Project name<br>Location | TAZ | Land use | | | | |
|---|---|---|---|---|---|---|
| | | Residential<br>units | Office<br>sq ft | Medical<br>sq ft | Retail<br>sq ft | Hotel<br>rooms |
| City of Oakland List of Major Development Projects | | | | | | |
| Emerald Views<br>222 19th Street | 945 | 370 | | | 933 | |
| Cathedral Gardens<br>2126 MLK, Jr. Way / 616-620 21st Street | 970 | 100 | | | | |
| 1800 San Pablo Avenue<br>1800 San Pablo Avenue | 970 | | | | 120,000 | |
| 1417-1431 Jefferson Street<br>1417-1431 Jefferson Street | 970 | 54 | | | 3,000 | |
| Uptown Parcel 4[1]<br>1901 Telegraph Avenue | 970 | 370 | | | | |
| 1538 Broadway[2]<br>1538 Broadway | 971 | 69 | | | | |
| Kaiser Center[3]<br>300 Lakeside Drive | 971 | | 1,345,000 | | 22,000 | |
| 1443 Alice Street<br>1443 Alice Street / 1434 Harrison Street | 971 | 245 | | | | |
| 1640 Broadway Mixed-Use Project<br>1640 Broadway | 971 | | | | | |
| Alternative 1 | | | 177,600 | | 4,710 | |
| Alternative 2 | | 254 | | | | |
| Upper Lake Merritt[4]<br>(Valdez & 23rd Street Project)<br>2315 Valdez Street / 2330 Webster Street<br>320-326 23rd Street | 972 | 281 | | | 12,000 | |
| 459 23rd Street[2]<br>459 23rd Street | 979 | 70 | | | | |
| 2538 Telegraph Avenue<br>2538 Telegraph Avenue / 437 26th Street | 979 | 97 | | | 9,000 | |
| Courthouse Condominiums<br>2935 Telegraph Avenue | 979 | | | | | |
| Alternative 1 | | 142 | | | 3,000 | |
| Alternative 2 | | | | 95,000 | | |
| Alta Bates Summit Medical Center<br>Summit Campus Seismic Upgrade and Master Plan[5]<br>Approximately bounded by Telegraph Avenue, 30th Street, Webster Street, 34th Street, Elm Street, and Hawthorne Ave. | 979 | | | 230,000 | | |
| Broadway West Grand[4]<br>(Negherbon Mixed-Use Project): Parcel B<br>2345 Broadway | 979 | 367 | | | 8,500 | |
| Shops at Broadway[4]<br>3001-3039 Broadway | 979 | | | | 35,750 | |

| Project name<br>Location | TAZ | Land use | | | | |
|---|---|---|---|---|---|---|
| | | Residential<br>units | Office<br>sq ft | Medical<br>sq ft | Retail<br>sq ft | Hotel<br>rooms |
| Office of Neighborhood Investment and other sources | | | | | | |
| Sears redevelopment[6]<br>1955 Broadway / 1901 Telegraph Avenue<br>(Uptown Parcel 4) | 970 | | | | 500,000 | |
| Telegraph Plaza / Giant Burger redevelopment<br>2100-2150 Telegraph Avenue | 970 | 300 | | | 43,000 | 150 |
| Star Park redevelopment<br>2016 Telegraph Avenue / 490 20th Street | 970 | No land use information currently available | | | | |
| Broadway / Valdez District Specific Plan<br>Broadway between 23rd Street and I-580, including the Valdez Triangle (approximately bounded by Broadway, Grand Avenue, Harrison Street, and 27th Street)[7] | 972<br>979 | 1,800 | 695,000 | | 1,114,000 | 180 |

Source: City of Oakland List of Major Development Projects (May 2013); Office of Neighborhood Investment, 2013; AECOM, 2013.

Notes:
DU = dwelling units
(1) Per Office of Neighborhood Investment staff, now grouped with Sears redevelopment.
(2) Also includes an unspecified amount of ground-floor retail.
(3) Also includes demolition of 280,000 square feet of office / retail.
(4) Per Office of Neighborhood Investment staff, included under the Broadway / Valdez District Specific Plan.
(5) Also includes demolition of several buildings and various longer-term improvements including additional buildings.
(6) Per Office of Neighborhood Investment staff, includes both the existing Sears store site and Uptown Parcel 4.
(7) The Broadway / Valdez District Specific Plan also includes seven parcels located within TAZ 942 on the block bounded by Harrison Street, Bay Place, and Grand Avenue, but the majority of the plan area is located within TAZs 972 and 979.

Table 2: Forecasted Development Potential and Pipeline Developments

| Development scenario<br>TAZ | Growth | |
|---|---|---|
| | Residential units[1] | Employment[2] |
| Forecasted development potential | | |
| TAZ 945 (Lake Merritt / Lakeside) | 1,943 | 2,624 |
| TAZ 970 (Uptown) | 2,195 | 5,217 |
| TAZ 971 (Broadway East / Lakeside) | 1,586 | 6,809 |
| TAZ 972 (Valdez Triangle / Oakland–Harrison) | 1,375 | 1,414 |
| TAZ 979 (Northgate–Waverly / Pill Hill) | 1,242 | 2,465 |
| Total | 8,341 | 18,529 |
| Pipeline developments[3] | | |
| TAZ 945 (Lake Merritt / Lakeside) | 370 | 2 |
| TAZ 970 (Uptown) | 454 | 1,499 |
| TAZ 971 (Broadway East / Lakeside) | 568 | 5,129 |
| TAZ 972 (Valdez Triangle / Oakland–Harrison)[4]<br>TAZ 979 (Northgate–Waverly / Pill Hill)[4] | 2,109 | 5,846 |
| Total | 3,501 | 12,475 |

Source: Plan Bay Area Preferred Alternative, 2013; AECOM, 2013.

Notes:
(1) For the forecasted development potential, residential units is equivalent to households.
(2) For the pipeline developments, employment is calculated assuming 300 sq ft / employee for office and medical uses, 500 sq ft / employee for retail uses, and 1 room / employee for hotel uses.
(3) For the pipeline developments, separate scenarios were considered (one maximizing residential uses, the other maximizing non-residential uses) due to projects with alternative land use programs.
(4) For the pipeline developments, TAZ 972 and TAZ 979 are grouped together because the Broadway / Valdez District Specific Plan includes parcels in both TAZs.

As the forecasted development potential for the aggregated TAZs exceeds the pipeline developments by a fairly substantial margin, the 2040 BRM ridership forecasts can be considered adequate (and conservative) for planning and design purposes. While the information regarding pipeline developments is based solely on currently available information and there is potential for additional land use developments not enumerated here to take place by 2040, the land use assumptions in the model likely provide a sufficient buffer in both residential and non-residential land uses to account for any such growth. As a result, AECOM recommends retaining the BRM ridership forecasts for the remainder of the technical analysis work.

Faregate Transactions

Peak Hour Faregate Activity

In order to adequately simulate passenger circulation through the station, AECOM has been coordinating with BART staff on obtaining system entries and exits for each of the faregates at the station. As indicated in station faregate diagrams provided by BART staff and verified by field observations conducted by AECOM, the station features a total of four faregate arrays (21 devices total), summarized in Table 3.

Table 3: Station Faregate Arrays

| Array | Location | Faregates | | | | |
|---|---|---|---|---|---|---|
| | | Entry-only (E) | Exit-only (X) | Reversible (R) | Accessible (AFG) | Total |
| Array 1 | Central Booth | 1 | 1 | 3 | 1 | 6 |
| Array 2 | North Booth (East) | 1 | 1 | 3 | 1 | 6 |
| Array 3 | North Booth (West) | 1 | 1 | 2 | | 4 |
| Array 4 | South Booth | 1 | 1 | 2 | 1 | 5 |
| Total | | 4 | 4 | 10 | 3 | 21 |

Source: BART, 2013.

BART has provided AECOM with faregate transactions in 15-minute intervals for each device for the entire day on the following three selected Thursdays of the past year:

- Thursday, October 11, 2012
- Thursday, November 8, 2012
- Thursday, November 15, 2012

These dates were selected in consultation with BART staff and confirmed against the Operations Control Center (OCC) service log to ensure that there were no service disruptions or major special events that could skew the data. Thursdays were selected because they are generally considered to be the busiest weekday. AECOM has begun reviewing peak hour data for the selected dates, summarized in Table 4 and Table 5.

As indicated in Table 4 and Table 5, Array 2 is by far the busiest of the arrays at the station, which was confirmed in the field observations of faregate activity during the weekday AM and PM peak hours. Given this consideration, AECOM recommends selecting Array 2 as the control point for determining the analysis hours for the capacity simulation. For weekday AM peak hour exits at Array 2, two of the selected dates give a peak hour of 8:00 to 9:00, while one gives a peak hour of 7:30 to 8:30. For weekday PM peak hour entries at Array 2, two of the selected dates give a peak hour of 16:30 to 17:30, while one gives a peak hour of 16:45 to 17:45. Based on these results, AECOM recommends 8:00 to 9:00 and 16:30 to 17:30 as the respective analysis hours for the weekday AM and PM peak hours.

Given that the data spread among the three selected dates is comparatively small, AECOM initially recommended use of the data set corresponding to the median data point for peak-hour, peak-direction activity at Array 2; i.e., Thursday, November 15, 2012 for the weekday AM peak hour and Thursday, October 11, 2012 for the weekday PM peak hour. Subsequent calculations to estimate train loads for the weekday

PM peak hour indicated that October 11, 2012 exhibited skewed ridership data systemwide due to an event not indicated in BART's OCC service log (Game 5 of the American League Division Series between the Oakland Athletics and Detroit Tigers, hosted at the O.co Coliseum). As a result, AECOM recommends using November 15, 2012 for the weekday PM peak hour, making the data consistent with the weekday AM peak hour and data used for the Coliseum / Oakland Airport Station capacity analysis, which is being conducted simultaneously with the 19th Street Oakland Station capacity analysis.

Table 4: Faregate Activity (Weekday AM Peak Hour)

| Direction / Array | Thursday, October 11, 2012 | | | | | Thursday, November 8, 2012 | | | | | Thursday, November 15, 2012 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7:30 to 8:30 | 7:45 to 8:45 | 8:00 to 9:00 | 8:15 to 9:15 | 8:30 to 9:30 | 7:30 to 8:30 | 7:45 to 8:45 | 8:00 to 9:00 | 8:15 to 9:15 | 8:30 to 9:30 | 7:30 to 8:30 | 7:45 to 8:45 | 8:00 to 9:00 | 8:15 to 9:15 | 8:30 to 9:30 |
| Entry | | | | | | | | | | | | | | | |
| Array 1 | 89 | 90 | 93 | 91 | 77 | 71 | 70 | 83 | 81 | 86 | 67 | 82 | 82 | 78 | 76 |
| Array 2 | 371 | 393 | 453 | 486 | 489 | 429 | 463 | 466 | 446 | 387 | 368 | 427 | 437 | 420 | 383 |
| Array 3 | 276 | 291 | 248 | 192 | 111 | 294 | 322 | 316 | 273 | 249 | 353 | 341 | 310 | 269 | 244 |
| Array 4 | 149 | 160 | 166 | 159 | 135 | 152 | 163 | 166 | 158 | 141 | 138 | 154 | 154 | 153 | 138 |
| Total | 885 | 934 | 960 | 928 | 812 | 946 | 1,018 | 1,031 | 958 | 863 | 926 | 1,004 | 983 | 920 | 841 |
| Exit | | | | | | | | | | | | | | | |
| Array 1 | 655 | 672 | 616 | 555 | 479 | 652 | 667 | 637 | 662 | 510 | 608 | 613 | 636 | 600 | 529 |
| Array 2 | 1,054 | 1,089 | 1,131 | 1,003 | 848 | 1,239 | 1,226 | 1,236 | 1,176 | 895 | 1,128 | 1,147 | 1,181 | 1,071 | 909 |
| Array 3 | 294 | 343 | 362 | 325 | 260 | 344 | 338 | 302 | 297 | 190 | 319 | 316 | 329 | 288 | 219 |
| Array 4 | 330 | 324 | 270 | 241 | 221 | 318 | 317 | 262 | 248 | 217 | 311 | 321 | 294 | 258 | 226 |
| Total | 2,333 | 2,428 | 2,379 | 2,124 | 1,808 | 2,553 | 2,548 | 2,437 | 2,383 | 1,812 | 2,366 | 2,397 | 2,440 | 2,217 | 1,883 |

Source: BART, 2013; AECOM, 2013.

Notes:
Shading indicates the peak hour.

Table 5: Faregate Activity (Weekday PM Peak Hour)

| Direction / Array | Thursday, October 11, 2012 | | | | | Thursday, November 8, 2012 | | | | | Thursday, November 15, 2012 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 16:30 to 17:30 | 16:45 to 17:45 | 17:00 to 18:00 | 17:15 to 18:15 | 17:30 to 18:30 | 16:30 to 17:30 | 16:45 to 17:45 | 17:00 to 18:00 | 17:15 to 18:15 | 17:30 to 18:30 | 16:30 to 17:30 | 16:45 to 17:45 | 17:00 to 18:00 | 17:15 to 18:15 | 17:30 to 18:30 |
| Entry | | | | | | | | | | | | | | | |
| Array 1 | 557 | 511 | 470 | 389 | 311 | 561 | 549 | 515 | 381 | 316 | 592 | 556 | 523 | 424 | 324 |
| Array 2 | 1,471 | 1,469 | 1,353 | 1,111 | 853 | 1,473 | 1,496 | 1,407 | 1,114 | 848 | 1,452 | 1,443 | 1,326 | 1,031 | 787 |
| Array 3 | 217 | 228 | 219 | 183 | 158 | 229 | 214 | 228 | 178 | 141 | 229 | 201 | 185 | 165 | 146 |
| Array 4[1] | 324 | 305 | 295 | 252 | 244 | 346 | 314 | 294 | 230 | 211 | 339 | 312 | 284 | 225 | 203 |
| Total | 2,569 | 2,513 | 2,337 | 1,935 | 1,566 | 2,609 | 2,573 | 2,444 | 1,903 | 1,516 | 2,612 | 2,512 | 2,318 | 1,845 | 1,460 |
| Exit | | | | | | | | | | | | | | | |
| Array 1[2] | 154 | 163 | 169 | 194 | 208 | 150 | 169 | 188 | 206 | 216 | 166 | 190 | 208 | 217 | 202 |
| Array 2 | 226 | 284 | 326 | 367 | 370 | 258 | 308 | 358 | 359 | 363 | 239 | 296 | 341 | 363 | 361 |
| Array 3 | 188 | 214 | 218 | 245 | 229 | 169 | 191 | 201 | 199 | 222 | 209 | 224 | 232 | 241 | 211 |
| Array 4 | 108 | 133 | 139 | 158 | 172 | 100 | 113 | 132 | 127 | 129 | 90 | 112 | 115 | 127 | 134 |
| Total | 676 | 794 | 852 | 964 | 979 | 677 | 781 | 879 | 891 | 930 | 704 | 822 | 896 | 948 | 908 |

Source: BART, 2013; AECOM, 2013.

Notes:
Shading indicates the peak hour.
(1) For faregate entries at Array 4, the weekday PM peak hour on all three survey dates is 16:15 to 17:15, with 355, 361, and 367 entries, respectively.
(2) For faregate exits at Array 1, the weekday PM peak hour on Thursday, October 11, 2012 is 17:45 to 18:45, with 211 exits.

Accessible Faregate Usage

AECOM also conducted field observations of weekday AM and PM peak hour faregate usage on Thursday, July 18, 2013 to obtain additional data for the simulation analysis. Specifically, AECOM observed transactions for 10-minute intervals at each of the station's accessible faregates to characterize passenger usage of the gate:

- Usage A: Passengers with bicycles, luggage, strollers, etc.;
- Usage B: Passengers with disabilities or other mobility concerns;
- Usage C: Passengers diverting as a result of queues at non-accessible faregates; and,
- Usage D: Passengers using the accessible faregate as they would a non-accessible faregate.

This data is summarized in Table 6. As indicated in Table 6, accessible faregate usage at the station can primarily be attributed to passengers using the accessible faregates as they would non-accessible faregates, together with a smaller share of passengers with bicycles or luggage.

Table 6: Accessible Faregate Usage

| Direction / Array | Transactions | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Weekday AM peak hour | | | | | Weekday PM peak hour | | | | |
| | Survey time | Usage | | | | Survey time | Usage | | | |
| | | A | B | C | D | | A | B | C | D |
| Entry | | | | | | | | | | |
| Array 1 | 8:07 – 8:17 | 1 | | | 1 | 17:03 – 17:13 | | | | 4 |
| Array 2 | 8:20 – 8:30 | 8 | | | 13 | 17:15 – 17:25 | 7 | | 2 | 24 |
| Array 3 | This array does not have an accessible faregate. | | | | | | | | | |
| Array 4 | 8:18 – 8:28 | | 1 | | 6 | 17:13 – 17:23 | | | | 11 |
| Exit | | | | | | | | | | |
| Array 1 | 8:07 – 8:17 | 1 | 1 | | 11 | 17:03 – 17:13 | | | | 2 |
| Array 2 | 8:20 – 8:30 | | | | 19 | 17:15 – 17:25 | | | | |
| Array 3 | This array does not have an accessible faregate. | | | | | | | | | |
| Array 4 | 8:18 – 8:28 | 1 | | | 2 | 17:13 – 17:23 | 1 | | | |

Source: AECOM, 2013.

Faregate Queues and Passenger Diversion

At the North Booth, AECOM's field observations on Thursday, June 27, 2013 also verified that queues form during the weekday AM peak hour as passengers attempt to exit the station at Array 2 (east of the station agent booth), particularly after timed transfers between San Francisco International Airport – Pittsburg / Bay Point and Fremont – Richmond trains. AECOM observed passenger behavior to determine an approximate share of exiting passengers at Array 3 (west of the station agent booth) had actually diverted to avoid queues at Array 1. Observations indicated that approximately ten percent of passengers bound for the east exit at the North Booth actually used Array 3 in order to avoid passenger queues at Array 2.

Peak Hour Faregate Orientation

AECOM also conducted visual observations of the orientation of reversible gates (programmable for either entry or exit) during the weekday AM and PM peak hours on Thursday, June 27, 2013. This data was checked against the 15-minute transaction data for November 15, 2012 provided by BART. While some differences were found at Array 3, the faregate orientation data provided by BART was selected in order to stay consistent with the faregate transaction data. This data is summarized in Table 7 by aisle (entry, exit, or bi-directional accessible aisles).

Faregate Capacity

BART provided AECOM with an estimated faregate capacity of 30 transactions per minute. Previous estimates obtained from other studies estimated approximately 25 transactions per minute, while analysis of the 15-minute faregate transaction data from BART for both 19th Street Oakland Station and Coliseum / Oakland Airport Station determined that the maximum activity at any single faregate over a 15-minute interval was approximately 301 transactions (an average of approximately 20 transactions per minute).

Table 7: Faregate Aisle Orientation

| Array | Faregate Aisles | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Weekday AM peak hour | | | | Weekday AM peak hour | | | |
| | Entry | Exit | Accessible | Total | Entry | Exit | Accessible | Total |
| Array 1 | 1 | 3 | 1 | 5 | 2 | 2 | 1 | 5 |
| Array 2 | 1 | 3 | 1 | 5 | 2 | 2 | 1 | 5 |
| Array 3 | 1 | 2 | | 3 | 1 | 2 | | 3 |
| Array 4 | 1 | 2 | 1 | 4 | 1 | 2 | 1 | 4 |
| Total | 4 | 10 | 3 | 17 | 6 | 8 | 3 | 17 |

Source: BART, 2013.

In order to determine appropriate capacity numbers for use in the simulation analysis, field observations of faregate activity at Array 2 were conducted on Tuesday, July 30, 2013 to calculate an empirical saturated capacity in transactions per minute. Several spot counts, approximately 30 seconds to one minute in length each, were conducted of passengers exiting the faregates. Counts were conducted during the weekday AM peak period after the arrival of northbound trains on the station's upper platform level in order to ensure sustained demand during the entire counting interval.

Based on these field observations, the saturated faregate capacity is approximately 25 to 27 transactions per minute. While future take-up of Clipper cards—or complete conversion to near-field communications (NFC) technology—could potentially accelerate average transaction times at faregates over existing conditions (i.e., use of both Clipper cards and magnetic-strip tickets), field observations indicated a high occurrence of read / write failures, both user- and equipment-based, that reduced the actual capacity of faregates, particularly with Clipper transactions. As a result, AECOM recommends conservatively assuming a saturated faregate capacity of 25 transactions per minute in the simulation analysis.

Station Vertical Circulation (Free Area)

The station comprises three underground levels—one concourse level and two platform levels—as illustrated in Figure 2. The east and west sides of the upper platform level are designated "Platform 1" and "Platform 3", respectively, while "Platform 2" is found on the lower level.

Vertical Circulation Capacity

As verified by field observations, the station currently has six entrances from street level (two at each booth), two entrances at the concourse level, and a street-access elevator (adjacent to the ground floor of the building at 1746-1750 Broadway, at the South Booth). Although BART has provided AECOM with a basic floor plan of the station, current, to-scale drawings of the station were not available. As a result, AECOM conducted field measurements of vertical circulation facilities at the station's main entrances.

Although BART provided general standards for escalator speed (in the range of 90 to 100 feet per minute), AECOM also conducted supplementary measurements of transit time on all escalators and stairwells at station entrances and confirmed escalator orientation during the weekday AM and PM peak hours. This data is summarized in Table 8 and will be incorporated into the simulation analysis.

Figure 2: Station Layout

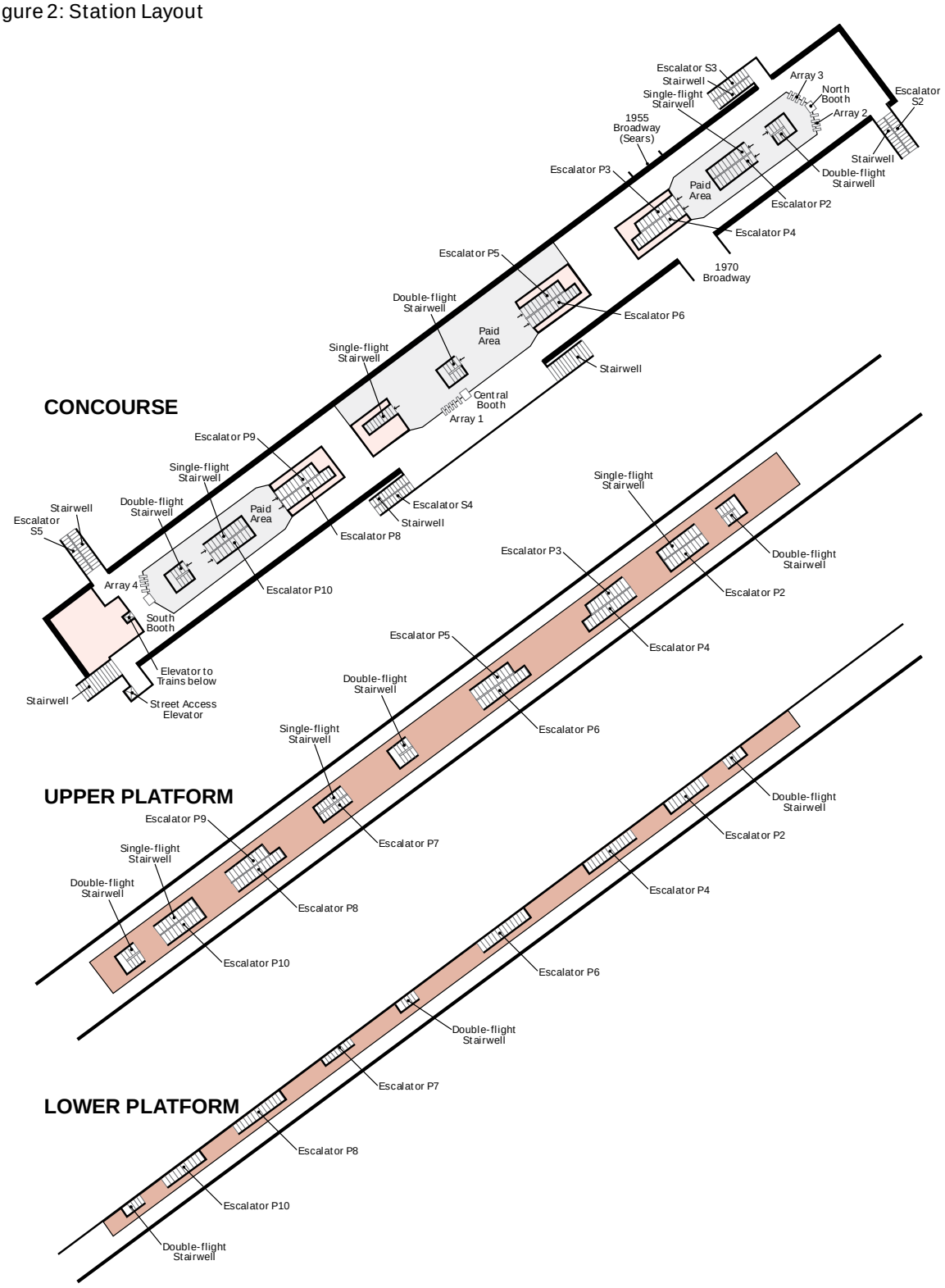


Table 8: Station Vertical Circulation (Free Area)

| Entrance | Location | Facility | Width[1] (in) | Transit time (s) | | Orientation | |
|---|---|---|---|---|---|---|---|
| | | | | ↑ | ↓ | Weekday AM peak hour | Weekday PM peak hour |
| North Booth | | | | | | | |
| East Entrance | Broadway / 20th Street, northeast corner | Escalator S2 | 22 | 31 | 33 | ↑ | ↓ |
| | | Stairwell | 58 | 24 | 22 | | |
| West Entrance | Broadway / 20th Street, southeast corner | Escalator S3 | 22 | 35 | 35 | ↓ | ↑ |
| | | Stairwell | 58 | 31 | 28 | | |
| 1970 Broadway | Concourse level, east side | | | | | | |
| 1955 Broadway (Sears)[2] | Concourse level, west side | | | | | | |
| Central Booth | | | | | | | |
| North Entrance | Broadway / 19th Street, southeast corner | Stairwell | 54 / 54 | 31 | 30 | | |
| South Entrance | East side of Broadway, mid-block between 19th and 20th Streets | Escalator S4 | 22 | --[3] | | ↑ | ↑ |
| | | Stairwell | 56 | 32 | 32 | | |
| South Booth | | | | | | | |
| East Entrance | Broadway / 17th Street, northeast corner | Stairwell | 54 / 54 | 34 | 31 | | |
| West Entrance | 1727 Broadway (west side of Broadway, between 17th and 19th Streets) | Escalator S5 | 22 | 35 | | ↑ | ↑ |
| | | Stairwell | 56 | 33 | 33 | | |
| Street-access elevator[4] | 1746-1750 Broadway (northeast corner of Broadway / 17th Street) | | | | | | |

Source: BART, 2013; AECOM, 2013.

Notes:
Width and transit time measurements are approximate.
(1) "Width" represents escalator step width for escalators and handrail-to-handrail widths for stairwells. Two values are reported for stairwells with a center handrail, representing the width of each half.
(2) This entrance is currently closed at all times, but consists of two escalators and a center stairwell.
(3) The escalator was not in operation at the time that surveys of transit time on the station's vertical circulation facilities were conducted. AECOM will attempt to collect the data once the escalator is in operation, but recommends assuming the recorded travel time at the West Entrance at the North Booth (a conservative estimate) should the escalator not be repaired in time to conduct the capacity simulation analysis.
(4) As field observations verified that usage of the street-access elevator was minimal, measurements of transit time in the street-access elevator were omitted from the data collection effort.

## Circulation Patterns

In order to accurately model circulation patterns in the free area of the station concourse level, AECOM conducted passenger counts at each booth to determine how passengers distributed themselves across the available station entrances. Each entrance was counted for one ten-minute interval during each of the weekday AM and PM peak hours on a Thursday (either June 27, 2013 or July 18, 2013). The concourse-level entrances at 1970 Broadway, along with activity generated by the adjacent Subway restaurant, were omitted from this exercise because visual observations indicated that overall foot traffic at these entrances was

negligible. The concourse-level entrance at 1955 Broadway (Sears) was also omitted because it is currently closed at all times of the day. This data is summarized in Table 9.

Table 9: Station Circulation Patterns (Free Area)

| Entrance | Facility | Weekday AM peak hour | | | Weekday PM peak hour | | |
|---|---|---|---|---|---|---|---|
| | | Survey period | Count (patrons) | | Survey period | Count (patrons) | |
| | | | Exiting station ↑ | Entering station ↓ | | Exiting station ↑ | Entering station ↓ |
| North Booth | | | | | | | |
| East Entrance | Escalator S2 | 8:32 – 8:42 | 119 | | 17:27 – 17:37 | | 111 |
| | Stairwell | | 65 | 86 | | 77 | 71 |
| | Subtotal | | 184 | 86 | | 77 | 182 |
| West Entrance | Escalator S3 | | | 31 | | 32 | |
| | Stairwell | | 15 | 7 | | 1 | 35 |
| | Subtotal | | 15 | 38 | | 33 | 35 |
| Total | | | 199 | 124 | | 110 | 217 |
| Central Booth | | | | | | | |
| North Entrance[1] | Stairwell | 8:06 – 8:16 | 15 | 4 | 17:01 – 17:11 | 8 | 10 |
| | Subtotal | | 15 | 4 | | 8 | 10 |
| South Entrance | Escalator S4 | | 67 | | | 12 | |
| | Stairwell | | 9 | 7 | | 0 | 124 |
| | Subtotal | | 76 | 7 | | 12 | 124 |
| Total | | | 91 | 11 | | 20 | 134 |
| South Booth | | | | | | | |
| East Entrance | Stairwell[2] | 9:18 – 9:28 | 22 | 16 | 16:37 – 16:47 | 11 | 38 |
| | Subtotal | | 22 | 16 | | 11 | 38 |
| West Entrance | Escalator S5 | | 16 | | | 7 | |
| | Stairwell | | 1 | 4 | | 0 | 15 |
| | Subtotal | | 17 | 4 | | 7 | 15 |
| Street-access elevator | | | 2 | 1 | | 5 | 3 |
| Total | | | 41 | 21 | | 23 | 56 |

Source: AECOM, 2013.

Notes:

(1) Weekday AM peak hour counts do not include eight passengers who exited the faregates at this location and proceeded to the North Booth station exits, as well as two passengers who passed through this location from the North Booth area. Weekday PM peak hour counts do not include four passengers who exited the faregates at this location and proceeded to the North Booth station exits.

(2) Weekday AM peak hour counts do not include a group of approximately 18 passengers, presumably on a field trip, exiting via the East Entrance stairwell.

Travel Mode to Station

Based on the results of empirical surveys conducted at the station as part of the 2008 BART Station Profile Study, the overwhelming majority of station users travel to and from the station on foot. Travel mode to the station for both home and non-home origins is summarized in Table 10.

Table 10: Travel Mode to Station

| Origin | Travel Mode | | | | | |
|---|---|---|---|---|---|---|
| | Walk (only) | Bus / transit | Drive alone | Carpool | Dropped off | Bicycle |
| Home | 70% | 11% | 2% | 2% | 9% | 6% |
| Non-home | 93% | 2% | 1% | < 1% | 2% | 1% |

Source: 2008 BART Station Profile Study.

AECOM has contacted staff at AC Transit regarding data on the number of passengers transferring between AC Transit and BART. However, it is not expected that travel behavior among the station's users will change substantially by the horizon year to warrant explicit consideration of travel mode to and from the station beyond the empirical data already obtained regarding circulation patterns across the station's entrances. As a result, AECOM recommends omitting travel mode from the simulation analysis. Should a mode-specific capacity analysis (such as estimating passenger flows between the station and connecting-mode facilities such as transit stops and bicycle parking) be desired or later deemed necessary, AECOM recommends use of the data in Table 10 from the 2008 BART Station Profile Study.

Station Vertical Circulation (Paid Area)

Vertical Circulation Capacity

As indicated on station plans provided by BART and verified by field observations, the paid area of the station currently features a total of nine escalators (three for each station booth); three spiral, double-flight stairwells serving both platform levels (one at each booth); and three single-flight stairwells serving the upper (northbound) platform level (one at each booth). The station's platform-access elevator is located within the free area at the South Booth.

Although BART provided general standards for escalator speed (in the range of 90 to 100 feet per minute), AECOM conducted supplementary measurements of transit time on all escalators and stairwells. As field observations verified that usage of the platform-access elevator was minimal, measurements of transit time in the platform-access elevator were omitted from the data collection effort.

Similar to vertical circulation facilities in the station's free area, AECOM conducted field measurements of paid-area vertical circulation, summarized in Table 11.

Table 11: Station Vertical Circulation (Paid Area)

| Facility | Location / Orientation[1] | Width[2] (in) | Transit time (s) | |
|---|---|---|---|---|
| | | | ↑ | ↓ |
| North Booth | | | | |
| Escalator P2 | Concourse —> Lower platform | 39 | | 36 |
| Escalator P3 | Upper platform —> Concourse | 39 | 15 | |
| Escalator P4 | Lower platform —> Concourse | 39 | 36 | |
| Single-flight stairwell | Upper platform <—> Concourse | 62 | 17 | 17 |
| Double-flight stairwell | Lower platform <—> Upper platform <—> Concourse | 45 | 22 / 37 | 22 / 37 |
| Central Booth | | | | |
| Escalator P5 | Upper platform —> Concourse | 39 | 15 | |
| Escalator P6 | Lower platform —> Concourse | 39 | 37 | |
| Escalator P7 | Upper platform —> Lower platform | 39 | | 25 |
| Single-flight stairwell | Upper platform <—> Concourse | 62 | 16 | 16 |
| Double-flight stairwell | Lower platform <—> Upper platform <—> Concourse | 45 | 20 / 34 | 21 / 34 |
| South Booth | | | | |
| Escalator P8 | Lower platform —> Concourse | 39 | 37 | |
| Escalator P9 | Upper platform —> Concourse | 39 | 15 | |
| Escalator P10 | Concourse —> Lower platform | 39 | | 37 |
| Single-flight stairwell | Upper platform <—> Concourse | 62 | 16 | 16 |
| Double-flight stairwell | Lower platform <—> Upper platform <—> Concourse | 45 | 22 / 34 | 20 / 35 |

Source: BART, 2013; AECOM, 2013.

Notes:
Width and transit time measurements are approximate.
[1] Observations during both the weekday AM and PM peak hours indicated that escalator orientation within the paid area of the station did not change across the course of the day.
[2] "Width" represents escalator step width for escalators and handrail-to-handrail widths for stairwells. Two values are reported for double-flight stairwells, representing the upper flight (first value) followed by the lower flight (second value).

## Circulation Patterns

In order to accurately model circulation patterns in the paid area of the station, AECOM conducted passenger counts at each booth to determine how passengers distributed themselves between escalators and stairwells. Each vertical circulation facility was counted for one ten-minute interval during each of the weekday AM and PM peak hours on a Thursday (June 27, 2013). As counts were conducted at concourse level, Escalator P7, traveling from the upper platform level to the lower platform level, was omitted from these counts. However, AECOM will estimate usage of this escalator based on the passenger OD matrix for the station and the 15-minute faregate transaction data (for Array 1 at the Central Booth) provided by BART. This data is summarized in Table 12.

Table 12: Station Circulation Patterns (Paid Area)

| Facility | Weekday AM peak hour | | | Weekday PM peak hour | | |
|---|---|---|---|---|---|---|
| | Survey period | Count (patrons) | | Survey period | Count (patrons) | |
| | | Exiting station ↑ | Entering station ↓ | | Exiting station ↑ | Entering station ↓ |
| North Booth | | | | | | |
| Escalator P2 | 8:40 – 8:50 | | 90 | 17:11 – 17:21 | | 180 |
| Escalator P3 | | 35 | | | 29 | |
| Escalator P4 | | 115 | | | 24 | |
| Single-flight stairwell | | 13 | 16 | | 15 | 115 |
| Double-flight stairwell | | 15 | 2 | | 5 | 3 |
| Total | | 178 | 108 | | 73 | 298 |
| Central Booth | | | | | | |
| Escalator P5 | 8:54 – 9:04 | 39 | | 16:58 – 17:08 | 17 | |
| Escalator P6 | | 42 | | | 5 | |
| Escalator P7 | | Not counted | | | Not counted | |
| Single-flight stairwell | | 45 | 13 | | 16 | 58 |
| Double-flight stairwell | | 13 | 2 | | 8 | 2 |
| Total | | 139 | 15 | | 46 | 60 |
| South Booth | | | | | | |
| Escalator P8 | 9:10 – 9:20 | 36 | | 16:47 – 16:57 | 7 | |
| Escalator P9 | | 18 | | | 4 | |
| Escalator P10 | | | 23 | | | 28 |
| Single-flight stairwell | | 1 | 1 | | 2 | 33 |
| Double-flight stairwell | | 3 | 0 | | 3 | 0 |
| Platform-access elevator | | 1 | 1 | | 0 | 3 |
| Total | | 59 | 25 | | 16 | 64 |

Source: AECOM, 2013.

## Platform Stopping Locations and Distribution

### Platform Stopping Locations

AECOM conducted field observations of stopping locations on both platform levels for six-, eight-, and nine-car trains, as train position may affect how passengers circulate at platform level and through the station's paid area. It is assumed that these are pre-programmed for each platform and do not change across time of day or day of the week. The results are summarized in Table 13.

Table 13: Platform Stopping Locations

| Platform Consist | Door | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ← North | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | South → |
| Platform 1 (Upper Level, East side – for Richmond) | | | | | | | | | | | | | | | | | | | | | | |
| 6 cars | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | |
| 8 cars | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| 9 cars | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |
| Platform 2 (Lower Level – for Fremont, Millbrae, and SFO Airport) | | | | | | | | | | | | | | | | | | | | | | |
| 6 cars | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | |
| 8 cars | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| 9 cars | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| Platform 3 (Upper Level, West side – for Pittsburg / Bay Point) | | | | | | | | | | | | | | | | | | | | | | |
| 8 cars | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| 9 cars | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |

Source: AECOM, 2013.

Notes:
Shading indicates occupied length of platform relative to the door positions marked on the platform.

Train Consists

AECOM conducted field observations on Thursday, August 1, 2013 and Thursday, August 8, 2013 to determine train consists (i.e., formation length, in number of cars) for trains serving the station during the weekday AM and PM peak hour. As train length may vary from one day to the next, Thursdays were selected to stay consistent with other day-sensitive data. As train lengths on the same line may vary by trip, the length of each specific train stopping at the station during these hours was observed. Train consist data is summarized in Table 14. Trains with timepoints up to three minutes before the identified peak hour at the faregates are included to account for transit time between train disembark at platform level and faregate transaction at concourse level.

Passenger Distribution on Platforms

To determine distribution of passengers on platforms, AECOM conducted passenger counts on both platform levels by dividing each platform into 20 segments (one for each possible train door position) and counting patrons waiting on the platform in each segment. Each segment was counted for a minimum of four trains during each of the weekday AM and PM peak hours on a Thursday (June 27, 2013) to obtain a sufficient sample size. The aggregated data for each platform is summarized in Table 15.

Street-Level Circulation

Given that the pipeline developments within the horizon year of 2040 are mostly concentrated in neighborhoods north of the station, AECOM expects that new ridership will primarily use station entrances at the North Booth. As there are already existing capacity-related issues with the sidewalk along the north side of 20th Street east of the station, AECOM conducted pedestrian counts at both street-level station entrances at the Broadway / 20th Street intersection to facilitate a capacity analysis of sidewalks at these locations. One ten-minute spot count was conducted at each location for each of the weekday AM and PM peak hours on a Thursday (July 18, 2013). The street-level circulation data is summarized in Table 16.

Table 14: Train Consists

| Timepoint | Line | Origin | Destination | Consist (cars) |
|---|---|---|---|---|
| **Northbound – Platforms 1 and 3** | | | | |
| *Weekday AM peak hour* | | | | |
| 8:00 | | Millbrae | Richmond | 10 |
| 8:08 | | SFO Airport | Pittsburg | 10 |
| 8:08 | | Fremont | Richmond | 6 |
| 8:15 | | Millbrae | Richmond | 9 |
| 8:23 | | SFO Airport | Pittsburg | 9 |
| 8:23 | | Fremont | Richmond | 8 |
| 8:30 | | Millbrae | Richmond | 10 |
| 8:38 | | SFO Airport | Pittsburg | 8 |
| 8:38 | | Fremont | Richmond | 6 |
| 8:45 | | Millbrae | Richmond | 9 |
| 8:53 | | SFO Airport | Pittsburg | 9 |
| 8:53 | | Fremont | Richmond | 6 |
| 9:00 | | Millbrae | Richmond | 10 |
| *Weekday PM peak hour* | | | | |
| 16:30 | | Millbrae | Richmond | 10 |
| 16:32 | | Daly City | Concord | 10 |
| 16:38 | | SFO Airport | Pittsburg | 9 |
| 16:38 | | Fremont | Richmond | 6 |
| 16;45 | | Millbrae | Richmond | 8 |
| 16:47 | | Daly City | Concord | 9 |
| 16:53 | | SFO Airport | Pittsburg | 10 |
| 16:53 | | Fremont | Richmond | 6 |
| 17:00 | | Millbrae | Richmond | 9 |
| 17:02 | | Daly City | Pittsburg | 10 |
| 17:08 | | SFO Airport | Pittsburg | 9 |
| 17:08 | | Fremont | Richmond | 6 |
| 17:13 | | Daly City | N. Concord | 9 |
| 17:15 | | Millbrae | Richmond | 9 |
| 17:17 | | Daly City | Pittsburg | 8 |
| 17:23 | | SFO Airport | Pittsburg | 9 |
| 17:23 | | Fremont | Richmond | 6 |
| 17:28 | | Daly City | N. Concord | 10 |
| 17:30 | | Millbrae | Richmond | 9 |

| Timepoint | Line | Origin | Destination | Consist (cars) |
|---|---|---|---|---|
| **Southbound – Platform 2** | | | | |
| *Weekday AM peak hour* | | | | |
| 7:57 | | Pittsburg | SFO Airport | 10 |
| 7:59 | | Richmond | Fremont | 6 |
| 8:02 | | Pleas. Hill | Daly City | 10 |
| 8:04 | | Richmond | Millbrae | 9 |
| 8:07 | | Concord | Daly City | 8 |
| 8:12 | | Pittsburg | SFO Airport | 9 |
| 8:14 | | Richmond | Fremont | 6 |
| 8:19 | | Richmond | Millbrae | 9 |
| 8:22 | | Concord | Daly City | 10 |
| 8:27 | | Pittsburg | SFO Airport | 10 |
| 8:29 | | Richmond | Fremont | 6 |
| 8:34 | | Richmond | Millbrae | 9 |
| 8:37 | | Concord | Daly City | 10 |
| 8:42 | | Pittsburg | SFO Airport | 10 |
| 8:44 | | Richmond | Fremont | 6 |
| 8:49 | | Richmond | Millbrae | 8 |
| 8:52 | | Concord | Daly City | 8 |
| 8:57 | | Pittsburg | SFO Airport | 9 |
| 8:59 | | Richmond | Fremont | 8 |
| *Weekday PM peak hour* | | | | |
| 16:27 | | Pittsburg | SFO Airport | 10 |
| 16:29 | | Richmond | Fremont | 6 |
| 16:34 | | Richmond | Millbrae | 9 |
| 16:42 | | Pittsburg | SFO Airport | 8 |
| 16:44 | | Richmond | Fremont | 6 |
| 16:49 | | Richmond | Millbrae | 10 |
| 16:57 | | Pittsburg | SFO Airport | 9 |
| 16:59 | | Richmond | Fremont | 6 |
| 17:04 | | Richmond | Millbrae | 10 |
| 17:12 | | Pittsburg | SFO Airport | 9 |
| 17:14 | | Richmond | Fremont | 8 |
| 17:19 | | Richmond | Millbrae | 10 |
| 17:27 | | Pittsburg | SFO Airport | 9 |
| 17:29 | | Richmond | Fremont | 8 |

Source: AECOM, 2013.

Table 15: Passenger Distribution on Platforms

| Platform | Distribution (%) at each door | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ← North | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | South → |
| Weekday AM peak hour | | | | | | | | | | | | | | | | | | | | | | |
| 1 (Upper, East side) | | 0 | 0 | 5 | 3 | 0 | 8 | 5 | 5 | 3 | 3 | 15 | 13 | 13 | 15 | 8 | 3 | 5 | 0 | 0 | 0 | |
| 2 (Lower) | | 1 | 4 | 7 | 7 | 11 | 16 | 10 | 11 | 5 | 4 | 1 | 1 | 4 | 4 | 2 | 3 | 3 | 4 | 0 | 0 | |
| 3 (Upper, West side) | | 0 | 0 | 0 | 0 | 0 | 11 | 22 | 0 | 11 | 0 | 11 | 22 | 11 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | |
| Weekday PM peak hour | | | | | | | | | | | | | | | | | | | | | | |
| 1 (Upper, East side) | | 0 | 0 | 3 | 17 | 3 | 9 | 9 | 9 | 9 | 9 | 4 | 7 | 6 | 5 | 4 | 2 | 2 | 1 | 1 | 0 | |
| 2 (Lower) | | 0 | 1 | 2 | 7 | 14 | 7 | 11 | 12 | 6 | 9 | 3 | 4 | 3 | 6 | 4 | 6 | 3 | 3 | 1 | 0 | |
| 3 (Upper, West side) | | 3 | 3 | 6 | 6 | 6 | 6 | 7 | 5 | 2 | 2 | 5 | 9 | 6 | 8 | 6 | 6 | 7 | 2 | 2 | 2 | |

Source: AECOM, 2013.

Notes:
Distribution is approximate.

Table 16: North Booth Street-Level Pedestrian Counts

| Facility | Weekday AM peak hour | | Weekday PM peak hour | |
|---|---|---|---|---|
| | Survey period | Count (patrons) | Survey period | Count (patrons) |
| West Entrance | | | | |
| Entering station | | | | |
| Northbound | 8:45 – 9:00 | 11 | 17:37 – 17:47 | 4 |
| Southbound | | 23 | | 12 |
| Exiting station | | | | |
| Northbound | 8:45 – 9:00 | 4 | 17:37 – 17:47 | 25 |
| Southbound | | 0 | | 4 |
| Background traffic | | | | |
| Northbound | 8:45 – 9:00 | 5 | 17:37 – 17:47 | 9 |
| Southbound | | 8 | | 9 |
| East Entrance | | | | |
| Entering station | | | | |
| Eastbound | 8:44 – 8:54 | 14 | 17:38 – 17:48 | 15 |
| Westbound | | 60 | | 161 |
| Exiting station | | | | |
| Eastbound | 8:44 – 8:54 | 195 | 17:38 – 17:48 | 45 |
| Westbound | | 34 | | 16 |
| Background traffic | | | | |
| Eastbound | 8:44 – 8:54 | 14 | 17:38 – 17:48 | 8 |
| Westbound | | 8 | | 12 |

Source: AECOM, 2013.