CHAPTER 3.0 TRANSPORTATION

3.1 Introduction

This chapter presents the process and findings of the transportation analysis conducted for the project alternatives, including the No Build Alternative and four build alternatives. This chapter also includes analyses of the potential impacts of the Hybrid Alternative/Locally Preferred Alternative (LPA) as modified following publication of the Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) and Final EIR. Section 2.2.7 includes a detailed description of the Hybrid Alternative/LPA as modified.

Assessments of existing Geary corridor transportation conditions, both in terms of facilities and performance, are presented for public transit, vehicular traffic, non-motorized transportation, and vehicle parking/loading. Existing and future conditions are assessed within the regulatory framework(s) applicable to each travel mode.

3.1.1 | Transportation Chapter Organization

Each of this chapter's subsections addresses key issues associated with the potential adverse effects of the project, including:

- Corridor Travel Patterns
- Transit Conditions
- Automobile Traffic
- Pedestrian and Bicycle Transportation
- Parking and Loading Conditions

Each of these subsections, excluding the one addressing Corridor Travel Patterns, is generally organized according to the following structure:

- **Regulatory Setting:** This section, where applicable, describes relevant laws, policies and regulatory agencies.
- **Affected Environment:** This section includes information about existing travel conditions.
- **Methodology:** This section includes discussion of how impacts were evaluated and determined.
- **Environmental Consequences:** This section includes a summary of the potential significant environmental impacts of the project on each respective travel mode.
- **Avoidance, Minimization, and Mitigation Measures:** This section includes potential measures, if relevant, to avoid, minimize, or mitigate environmental impacts of the project.

The transportation chapter evaluates travel patterns that may be affected by the No Build and build alternatives. Based on the results of the analysis, an assessment is made about whether any of the build alternatives would adversely affect travel conditions in the study area.

3.1.2 | Transportation Analysis Process

The transportation analysis used data from a variety of sources. The analysis was based on a detailed multimodal evaluation consisting of several key steps, including:

Existing Conditions: Through an extensive data collection process, a detailed understanding of existing travel patterns on the corridor was developed. This served as the basis for the analytical tools used to evaluate how the project would affect future travel patterns. Unless specified otherwise, all data represents existing transportation conditions in 2012, when the bulk of the transportation data was collected. As further discussed in Section 3.4.2.2, automobile traffic data from 2012 was validated in early 2015, before the Draft EIS/EIR was published, and again in spring 2017 in association with preparation of the Final EIS. As noted in Section 3.4.2.2, these validation efforts found that traffic volumes on the Geary corridor decreased relative to the 2012 counts, so the future year operations conclusions based upon the 2012 counts would remain valid.

Future Travel Forecasting: Future travel patterns were estimated using transportation forecasting models, including the San Francisco Chained Activity Modeling Process (SF-CHAMP). SF-CHAMP is a regional travel demand model used to assess the impacts of socioeconomic, land use, and transportation system changes on the performance of the local transportation system. Year 2020 No Build conditions were used as the environmental baseline against which future conditions were compared. Year 2020 was used as the baseline so as to more accurately compare the build alternatives taking into account future traffic conditions given the length of time between issuing the Notice of Preparation (2008) and the anticipated opening year of the project (2020). Travel behavior in SF-CHAMP is calibrated based on observed behavior from the California Household Travel Survey (CHTS). As of spring 2017, 2010-2012 CHTS data is the latest travel survey available so its data are still used to calibrate the SF-CHAMP model.

Transportation Operations: Projections of future conditions for the project opening year (2020) and the project horizon year (2035) for all No Build and build alternatives were then modeled using a mix of specialized transportation analysis tools, including multimodal simulation software, traffic analysis software, and assessments of pedestrian and bicycle safety. Appendices D-1 (Modeling Methodology Approach) and D2-1 (Land Use Inputs) describe these tools in greater detail.

Multiple traffic counts were conducted along the Geary corridor to determine when the maximum use of the transportation system occurs. The results indicated that the Geary corridor experiences the highest volumes during the p.m. peak period. Accordingly, the analysis in this Final EIS focuses on the p.m. peak period. This is consistent with the approach suggested in the San Francisco Planning Department's *Transportation Impact Analysis Guidelines*, the document which guides CEQA-level analysis in the City of San Francisco.

3.2 Corridor Travel Patterns

The Geary corridor is a key east-west travel corridor in San Francisco's street network. It functions as a major transit spine in the local San Francisco Municipal Transportation Agency (SFMTA) bus network as well as a key east-west automobile traffic connector. It is also used by regional bus routes such as Golden Gate Transit and by various employer shuttle services. This section provides an overview of existing and future travel patterns on the Geary corridor as well as in surrounding neighborhoods.

3.2.1 | Affected Environment

3.2.1.1 | GEARY TRANSPORTATION STUDY AREA

Figure 3.2-1 displays the Geary Transportation Study Area ("study area"). The overall boundaries of this study area are Pacific Street and Presidio Avenue on the north, Fulton Street on the south, the Pacific Ocean on the west, and Market Street on the east. None of the build alternatives propose physical improvements south of Market Street. Therefore, the study area focuses on points north and west of Market Street.

Multiple transit routes operate on the Geary corridor, including local, rapid, and express service

Similar to the whole of this document, this chapter uses "Geary corridor" to describe Geary Boulevard from 48th Avenue to Van Ness Avenue and the one-way pair of Geary and O'Farrell streets from Van Ness Avenue to Market Street (see Section 2.1.2 for a complete discussion of the project setting). Geary Boulevard is used to describe the area west of Gough Street; Geary Street is used to reference the area east of Gough Street.

References to the "Bay Area" refer to the nine-county San Francisco Bay Area, which encompasses San Francisco, Marin, Napa, Sonoma, Solano, Contra Costa, Alameda, Santa Clara, and San Mateo counties.

3.2.1.2 | GEARY CORRIDOR

As defined in Section 2.1.2, the Geary corridor is an east-west oriented thoroughfare located in the northern portion of San Francisco. The Geary corridor serves the majority of the northern half of San Francisco, connecting residents and businesses to numerous neighborhoods and employment centers, including the Financial District.

Note: On April 25, 2015, SFMTA changed naming conventions for limited bus services. Bus services previously referred to as limited and denoted by the letter "L" following the bus line number, e.g. 38L, are now referred to as rapid services and are denoted by the letter "R." Throughout this document the limited stop service on Geary Boulevard is referred to as "38R" or "38 Rapid"

Geary is one of the busiest transit corridors in San Francisco, with its buses carrying over 50,000 passenger trips per weekday. Pedestrian travel is substantial along and across Geary Boulevard and Geary and O'Farrell streets. Motor vehicle traffic varies greatly depending on location along the corridor, with between 20,000 and about 44,000 vehicles traveling along segments of the Geary corridor.[1]

Based on travel time, speed data, and passenger load information provided by SFMTA, the Geary corridor's existing transit routes are often unreliable and

[1] The above range reflects the central portions of the Geary corridor. Average daily traffic volumes are slightly lower (about 16,000) in the westernmost portion of the corridor (west of 34th Avenue).

crowded. As a result, one of the main goals of the build alternatives is to improve transit travel times and reliability.

3.2.1.3 | MAJOR STUDY AREA ROADWAYS

Geary Boulevard is wide compared with many streets in San Francisco, with an average right of way of about 125 feet between property lines throughout most of the corridor. Landscaped medians, multiple vehicular lanes, parking lanes, and sidewalks exist within the right of way. The layout of the Geary corridor has evolved differently in various segments. The street width is greatest between Laguna and Scott streets in the central section of the Geary corridor. Some segments in the Outer Richmond neighborhood in western Geary corridor have a narrower right of way than the central section of the Geary corridor. East of Gough Street, the one-way streets couplet of O'Farrell and Geary streets extends east to Market Street. Along this section of the corridor, the right of way averages roughly 65 feet between property lines on Geary and O'Farrell streets.

The majority of Geary Boulevard has three travel lanes in each direction, providing an expansive right of way for vehicle traffic. On-street parking is generally available on most blocks of the Geary corridor. Most parking is parallel parking, though several blocks in the Outer Richmond have diagonal on-street parking.

The Geary corridor bisects several residential, commercial, and light industrial areas in San Francisco's northern neighborhoods. The corridor intersects many other essential City streets, providing linkages to residences, commerce, and public open spaces. These connections are essential for transit connections, as well as for automobile traffic, bicyclists and pedestrians, as they provide a direct route to many other destinations and neighborhoods within the City.

The following sections describe the roadway network that provides essential transportation connections along the Geary corridor. Each of the following roadways has a unique typology ranging from highways, urban arterial streets, and local streets. In total, almost 90 roadways intersect the Geary corridor between 48th Avenue and Market Street.

3.2.1.3.1 REGIONAL ROADWAYS

- **Geary Boulevard/Street**: Geary Boulevard/Street is an east-west corridor located in the northern portion of San Francisco. The number of travel lanes throughout the corridor varies from two to eight. The majority of the 90 intersections along the Geary corridor from 48th Avenue to Market Street, are signalized. Traffic signals on Geary Boulevard are coordinated through a master control system. A number of Muni bus routes operate on Geary Boulevard, including: 38 Geary (38 or 38 Local), 38 Rapid (38R), 38 Geary A Express (38AX), 38 Geary B Express (38BX), and Golden Gate Transit Route 92.
- **O'Farrell Street**: O'Farrell Street is a one-way eastbound arterial roadway from Market Street to Franklin Street continuing as Starr King Way for one block between Franklin and Gough Street. It forms a one-way couplet with Geary Street, comprising the eastern portion of the Geary corridor. Between Gough and Powell streets, O'Farrell has two eastbound travel lanes and a bus-only lane. Muni bus routes 38 and 38R operate on O'Farrell Street.

- **Highway 1/Park Presidio:** Highway 1/Park Presidio is a major highway traveling north/south through San Francisco, following 19th Avenue to Golden Gate Park, continuing through the Richmond District on 14th Avenue eventually traversing through the Presidio area, merging with US 101 at the Golden Gate Bridge in the north. In San Francisco, Highway 1 has six travel lanes and sidewalks along both sides. At the point where Geary intersects with Highway 1, Highway 1 has six travel lanes, sidewalks on both sides, and a landscaped median. The intersection is signalized. The highway is owned and maintained by the California Department of Transportation (Caltrans). The following Muni bus routes operate on Highway 1/Park Presidio: 28, 28R, 29, and NX Judah Express.
- **Van Ness Avenue and South Van Ness Avenue**: Van Ness and South Van Ness avenues intersect the Geary corridor. Van Ness is a part of US 101, a north-south principal arterial roadway owned and maintained by Caltrans and on the National Highway System that provides Interstate, interregional, and intraregional travel as well as goods movement. Regionally, US 101 connects Marin County to the north with San Francisco, and San Mateo and Santa Clara counties to the south. US 101 begins as an elevated highway traveling north/south into San Francisco. Upon entering the City center, US 101 merges with Van Ness Avenue. US 101 then follows Lombard Street east/west to Presidio Parkway. Presidio Parkway is currently open for use, though final construction continues through 2017. Presidio Parkway provides six travel lanes connecting to Highway 1 and the Golden Gate Bridge. At the point where Geary intersects with Van Ness Avenue, Van Ness Avenue has (as of winter 2017) four travel lanes, center-running bus only lanes under construction, and on-street parking on both sides of the street. As of 2017, Van Ness BRT revenue service is scheduled to begin in 2020. Muni bus routes 47, 49, 30X, and 76X operate on Van Ness Avenue, as do several Golden Gate Transit routes.

3.2.1.3.2 MAJOR STREETS

There are nine north-south major or secondary arterial streets crossing the Geary corridor and six east-west major or secondary arterial streets parallel to the corridor. Their general characteristics, boundaries, and functions are described below.

North/South Streets

- **Arguello Boulevard** is a two-way, two-lane street with curbside parking on both sides of the street. Arguello begins near the northern border of Golden Gate Park at West Conservatory Drive and terminates near the northern border of the Presidio, north of the Geary corridor. Muni bus routes 33 and 2 operate on the Richmond District portion of Arguello Boulevard.
- **Stanyan Street** is a two-way, two to three-lane street that intersects Geary Boulevard, with curbside parking throughout most of its length. Stanyan Street begins at Geary Boulevard and terminates at Belgrave Avenue to the south. Muni bus routes 33 and 7 operate on Stanyan Street.

- **Masonic Avenue** starts south of the Geary corridor as residential two-way, four-lane street with on-street parking. Upon crossing Golden Gate Park, it continues north as a four-lane thoroughfare in each direction. Masonic terminates shortly after bisecting Geary Boulevard at Presidio Avenue and provides access to downtown via the east-west street couplet of Bush and Pine streets. Presidio Avenue also provides access to and from the Presidio. The intersection of Geary Boulevard and Masonic Avenue features an underpass/tunnel 1/10th of a mile in length and service roads for local traffic to make turns. A mix of bus, pedestrian, and bicycle flows exist at the surface. Muni bus routes 43 and NX Judah Express operate on Masonic Avenue.
- **Divisadero Street** is a two-way, four-lane street with parallel curbside parking on both sides of the street. Divisadero Street provides many intra-city bus connections. It connects to east/west US 101 to Fillmore Street. Divisadero Street starts at Waller Street and terminates at Marina Boulevard, several blocks north of the Geary corridor. Muni bus routes 24 and 30 operate on Divisadero Street. Route 31 operates on Divisadero for about one block near the intersection of Divisadero Street and Turk Street. Divisadero serves as a retail and entertainment hub for the surrounding neighborhoods.
- **Fillmore Street** is a two-way, two-lane street running parallel to Divisadero Street. Fillmore Street begins at Duboce Avenue to the south, then bisects US 101/Lombard Street, and terminates at Marina Boulevard, several blocks north of the Geary corridor. At Fillmore Street, Geary Boulevard through-travel lanes operate in a short underpass, with side service roads on the surface for local traffic to make turns. Muni bus routes 22 and 3 operate on Fillmore Street.

Figure 3.2-1 Geary Corridor and Transportation Study Area

- **Gough Street** is a one-way southbound street with three lanes of traffic and curbside parking on both side of the street. Gough Street runs parallel to Van Ness Avenue and begins at Market Street. A number of Muni bus routes cross Gough Street, but no Muni route operates primarily on Gough Street. Intersecting bus routes include Golden Gate Transit Route 10 and the following Muni lines: 7, 6, 21, 5, 5R, 31, 38, 38R, 38AX, 38BX, 2, 3, 1, 10, 41, 45, and 30X.
- **Franklin Street** is a one-way northbound street with three lanes of traffic with curbside parking on both sides of the street. The Franklin Street/Geary Boulevard intersection is where Geary Boulevard transitions to a one-way westbound arterial roadway. Franklin Street begins at Market Street to the south and terminates at Bay Street. A number of Muni bus routes cross Franklin Street, but there is no Muni route that operates primarily on Franklin Street. Intersecting bus routes include: 21, 5, 5R, 31, 38, 38R, 38AX, 38BX, 2, 3, NX Judah Express, 1, 10, 45, 66, 30, and 30X.
- **Stockton Street**, in the vicinity of Geary Street, is a one-way southbound street with portions of the street reserved for transit-only. Stockton Street begins near Fisherman's Wharf at The Embarcadero and terminates at Market Street. Muni lines operating on Stockton Street include 8, 30, and 45; each of these routes currently *cross* Geary Street while operating on adjacent parallel Mason and Kearny streets due to the temporary closure of the southern end of Stockton Street during Central Subway construction.
- **Kearny Street**, in the vicinity of Geary Street, is a one-way northbound street. Mirroring Stockton Street, Kearny Street begins at Market Street and terminates at The Embarcadero. Muni lines operating on Kearny Street include 8, 8AX, and 8BX.

East/West Streets

- **California Street** is a two-way, four-lane street with on-street parking available throughout most of its span, excluding some parts of the Financial District. California Street begins near Lincoln Highway to the west and Drumm Street to the east. The following Muni bus routes operate on California Street: 1, 1AX, 28R, 1BX, 33, 2, 18X.
- **Pine Street** is a one-way westbound street with three lanes and curbside parking on both sides of the street. Pine Street begins at Market Street to the east and ends at Presidio Avenue to the west. The following Muni bus routes operate on Pine Street: 1, 1AX, 31, 38AX, and 38BX.
- **Bush Street** is a one-way eastbound street with three lanes and curbside parking on both sides of the street throughout most of its length. Bush Street begins at Presidio Avenue to the west and terminates at Market Street to the east. The following Muni bus routes operate on Bush Street: 1, 1AX, 31, 38AX, 38BX, NX Judah Express, and 27.
- **Balboa Street** begins as a two-way, two-lane street at the Great Highway to the west and transitions to a three-lane street (two westbound lanes and one eastbound lane) at Park Presidio Boulevard. Balboa Street becomes Turk Street at Arguello Boulevard. Muni bus routes 18, 31, 31AX, and 31BX operate on Balboa Street.

- **Market Street** is a two-way, four-lane, multimodal thoroughfare aligned diagonally through the center of San Francisco. Market Street serves primarily as a transit corridor, carrying more than 100,000 people daily via streetcar and bus on the surface, and Muni Metro light rail and regional Bay Area Rapid Transit (BART) below ground to and from downtown. It is also an important pedestrian and bicycle corridor, providing direct and convenient walking and bicycling access to many destinations. It includes wide sidewalks, numerous bus stop islands, and it is the highest volume bicycle route in San Francisco. Through automobile traffic is discouraged along Market Street, with several intersections prohibiting through automobile movements or left turns. Market Street has exclusive transit-only lanes from 12th to Fifth streets in the eastbound direction and from Eighth Street to Van Ness Avenue in the westbound direction, in addition to boarding islands and marked Class II (marked on-street) bike lanes west of Eighth Street. Market Street begins at The Embarcadero in the east and terminates at Portola Drive to the west. Bus routes that operate on Market Street include: 6, 7, 14, 14X, 21, 31, 37, 9, 9R. The following Muni rail lines operate on- or below-ground on Market Street: J, KT, L, M and, N. The following SamTrans bus lines operate on Market Street: KX, 397, and 292. Market Street is a major BART corridor, with four of the agency's five rail lines running beneath Market Street.[2]:
- **Turk Street** spans between Market Street and Arguello Boulevard. It is a one-way westbound street with two travel lanes from Market Street to Divisadero Street. It continues to Arguello Boulevard as a two-way street with two westbound lanes and one eastbound lane. Turk Street continues as Balboa Street, which runs in the western part of San Francisco.
- **Golden Gate Avenue** spans between Market Street and Parker Avenue. It is a one-way eastbound street with two travel lanes from Market Street to Divisadero Street. It continues to Parker Avenue as a two-way street with two eastbound lanes and one westbound lane. Muni bus routes 18, 31, 31AX, and 31BX operate on Turk Street.

3.2.1.4 | TRAVEL MODE SPLITS

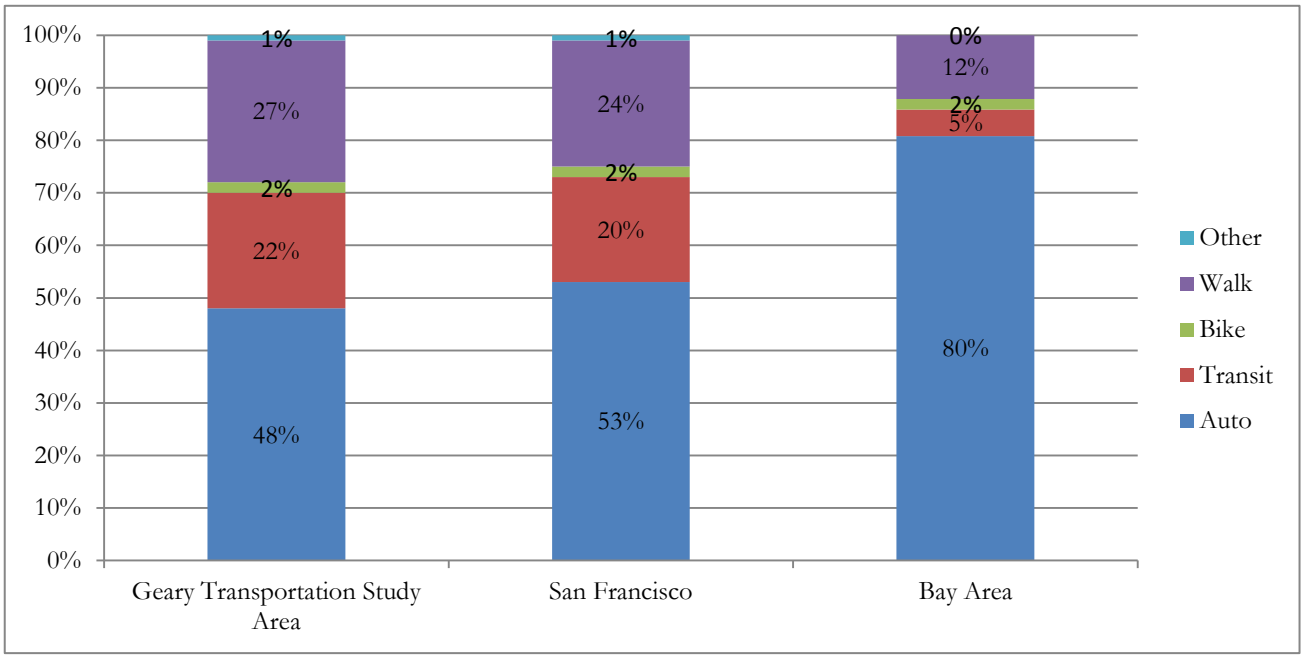
This section contains information on existing travel patterns derived from the modeling toolkit described in Appendix D-1 (Modeling Methodology Approach). It illustrates existing and future travel patterns, including travel demand, regional versus local travel patterns, the potential for trips to divert to different routes, and mode choices. Most of this data was obtained from local travel surveys and from the SF-CHAMP travel demand model.

Figure 3.2-2 presents total weekday trips by mode as reported by the California Household Travel Survey (2012), which is the latest iteration of this survey as of summer 2017. On an average weekday, slightly less than half of the trips that are made to, from, or within study area neighborhoods – the Richmond District, Western Addition, and the Tenderloin – are made by private vehicle. Meanwhile, slightly less than one-quarter of trips are made by transit, and slightly more than

[2] As of winter 2017, BART lines running beneath Market Street are: Richmond – Daly City/Millbrae, Warm Springs – Daly City, Pittsburg/Bay Point – SFO, Dublin/Pleasanton – Daly City, and Richmond – Daly City/Millbrae.

one-quarter of trips are made by walking. About 2 percent of total daily trips to, from, or within these neighborhoods are made by bicycle. Study area neighborhoods feature slightly less driving and more walking and transit than citywide averages. Walking and transit are far more common in both San Francisco and the study area than throughout the San Francisco Bay Area, where transit carries 5 percent of daily trips, and 12 percent are made by walking.

Figure 3.2-2 Mode Share for All Daily Weekday Trips (to/from/within specified geographies)



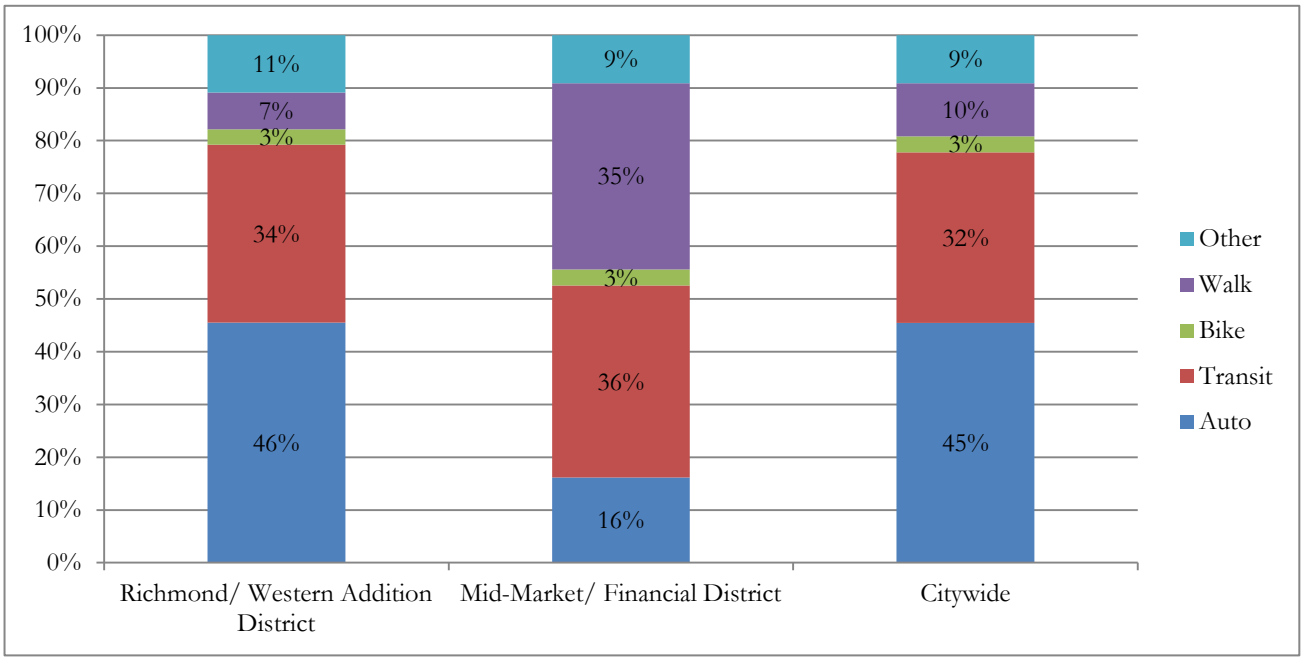
Note: "Other" category includes taxi and any mode other than walking, driving, transit, or bicycling.

Note: Percentages may not sum to 100 due to rounding.

Source: California Household Travel Survey (2012)

Figure 3.2-3 presents data on commute mode share in the Geary corridor and surrounding neighborhoods as reported in the 2012 American Community Survey (ACS) for the years 2008 through 2012. The modal distribution of commute trips from the Richmond and Western Addition areas is similar to citywide averages. Vehicle trips comprise slightly less than one-half of commuting trips, transit trips account for about one-third, and walking and bicycling trips to work are about 10 percent, combined.

Figure 3.2-3 Usual Mode for Commute to Work by Location of Residence (2008-2012)

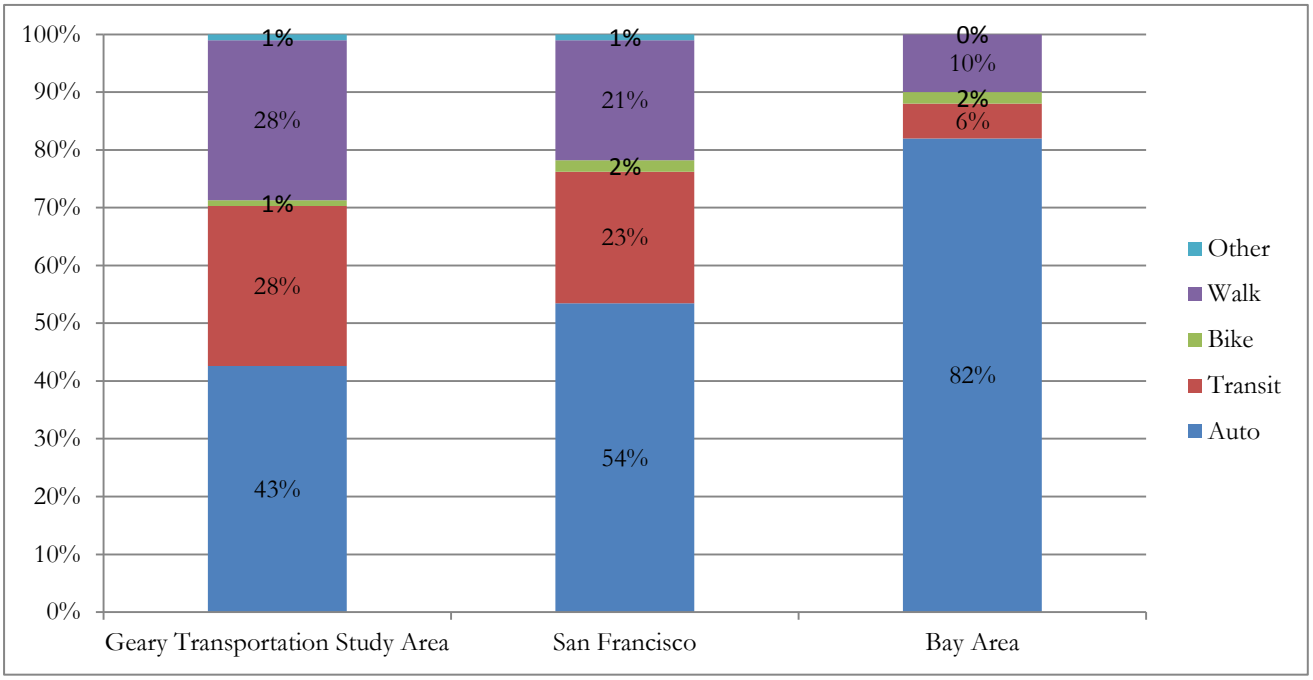


Note: "Other" category includes "Worked at Home," "Other Means," "Motorcycle," and "Taxicab."
Note: Percentages may not sum to 100 due to rounding.
Source: 2012 American Community Survey 5-Year Estimates (2008-12)

Areas of the study area that are closer to the Financial District have commute patterns with considerably less vehicle travel and significantly more walking than citywide averages.

Figure 3.2-4 presents total PM peak period trips by mode. During the PM peak commute period travel patterns in the Geary Transportation Study Area differ from all day trip making. During the PM peak period, transit ridership accounts for 28 percent of total Geary Transportation Study Area trips and 23 percent of San Francisco trips. These figures are higher than the overall weekday transit mode shares of 22 percent and 20 percent for trips in the Geary Transportation Study Area and San Francisco respectively. The increase in PM peak period transit trips corresponds to lower auto travel in the PM peak period. Auto mode share for trips to, from, or within the Geary Transportation Study Area falls from 48 percent of daily trips to 43 percent of trips in the PM peak period. In the PM peak period walking and transit are the primary travel modes for about 30 percent more Geary Transportation Study Area trips than auto travel.

Figure 3.2-4 Mode Share for All P.M. Peak Period Weekday Trips (to/from/within Specified Geographies)



Note: "Other" category includes taxi and any mode other than walking, driving, transit, or bicycling.

Note: Percentages may not sum to 100 due to rounding.

Source: California Household Travel Survey (2012)

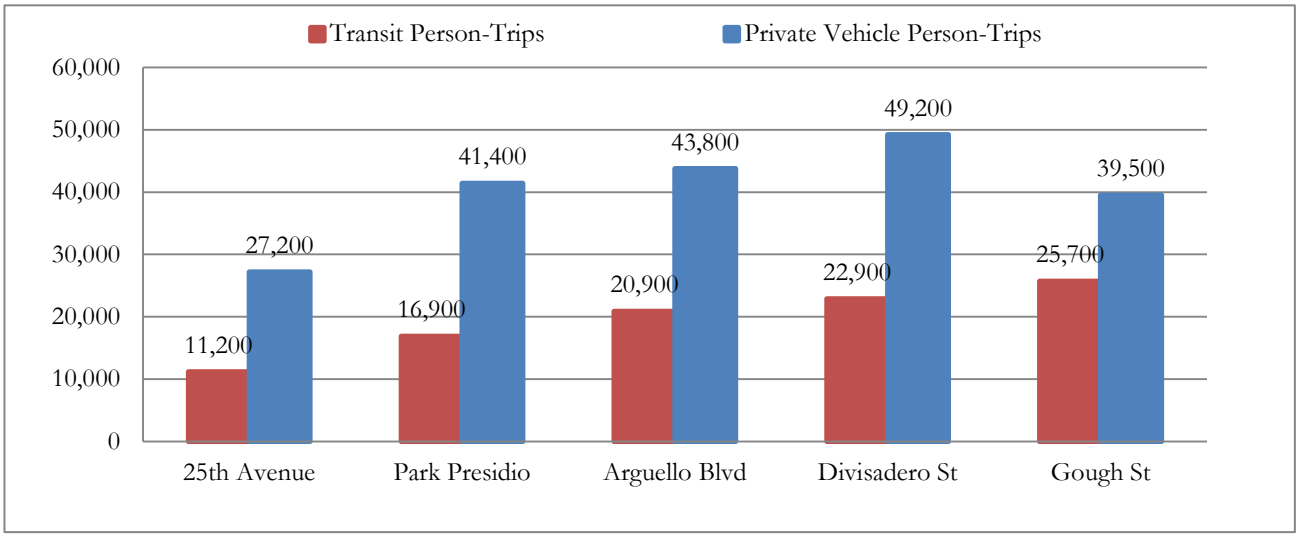
More recent ACS data have become available since publication of the Draft EIS/EIR. Annual estimates of citywide commute mode share are available through 2015. Between 2012 and 2015, the commute mode share for driving alone, carpooling, and riding motorcycles fell by 2.3 percent. During the same period, transit commute mode share increased by 1.6 percent and active modes (walking and biking) increased by 1.1 percent. Taxi commuting, which includes transportation network companies (TNCs) such as Uber and Lyft, rose during this period from 0.2 percent to 0.9 percent. Despite this growth, taxi and TNC commute mode share remained below 1 percent in 2015. The decline in driving and carpooling mode share between 2012 and 2015 is more than three times the mode share increase for taxis. The most significant trend between 2012 and 2015 is a shift from driving, or being driven, to transit, walking, and biking.

3.2.1.5 | TRAVEL DEMAND

Average weekday passenger boardings on Geary corridor bus lines exceed 50,000. Meanwhile, weekday traffic volumes reach about 44,000 vehicles at certain points along the corridor. The corridor also accommodates and attracts substantial pedestrian traffic, both along and across the Geary corridor. A number of bicycle facilities cross the corridor.

Traffic volumes on the Geary corridor peak in the area directly east of the Masonic tunnel complex. Traffic volumes decrease to the west and east of this area. Transit demand increases along the Geary corridor as one travels east on the 38, 38R, 38AX, and 38BX routes (see Section 3.3 for more discussion of transit-specific characteristics), and it peaks at or east of Van Ness Avenue. Figure 3.2-5 depicts existing person trips in vehicles (multiple occupants of a single vehicle are counted separately) and transit trips on the corridor.

Figure 3.2-5 Existing (2012) Weekday Vehicle-Person Trips for Geary Boulevard at Select Locations (for Travel Occurring on Geary Boulevard)



Source: SFMTA APC data and traffic counts, assembled by Fehr & Peers, 2011 and SFTCA 2014

3.2.2 | Future Travel Patterns

The San Francisco County Transportation Authority (SFCTA) has developed travel demand forecasts for the years 2020 and 2035. These forecasts, developed using SF-CHAMP, predict how travel could change in the corridor over time and how the build alternatives would alter travel relative to the No Build Alternative. The forecasts are based on planned roadway and transit network improvements throughout the City and Bay Area.

3.2.2.1 | FORECAST YEARS

The year 2020 represents opening day conditions and the year 2035 represents horizon year conditions. According to the Federal Transit Administration's (FTA) New and Small Starts processes – FTA's primary grant programs for funding major transit capital investments – the agency allows project sponsors, at their option, to calculate evaluation criteria using horizon year-based estimates as well as current year estimates. Year 2020 No Build has been selected as the environmental baseline against which to compare the opening and horizon year build alternatives. According to FTA guidance, project sponsors should determine the horizon year they wish to use – either 10 years or 20 years in the future from the current date. SFCTA and SFMTA have selected year 2035, just less than 20 years from now, as the project's horizon year.

3.2.2.2 | PLANNED NETWORK IMPROVEMENTS

SFCTA travel demand forecasts for future years assume that land uses and transportation infrastructure will change from current conditions. This section describes the transportation projects and land uses assumed in the 2020 and 2035 travel demand forecasts. Transportation System Assumptions

All future build alternatives for the same year (i.e., 2020 or 2035) are modeled with uniform transportation system and land use assumptions. This means that the only differences between the various model run scenarios are the definitions of the build alternatives.

In future year project scenarios, the transportation networks reflect forecasted changes to the transportation system, including all reasonably foreseeable transport projects. The baseline projects included in future year analysis that are most likely to affect transportation system performance in the study area include transit signal priority on the Geary corridor, four new traffic signals on the Geary corridor, the opening of the Van Ness Avenue BRT project, and completion of the Central Subway and Presidio Parkway projects. A separated bike lane project on Masonic Avenue will also reduce the number of travel lanes on Masonic Avenue. All of these projects are accounted for in the No Build and build alternatives.

A complete list of both regional transportation projects assumed to be completed by 2020 and by 2035 is included in Appendix D-1 (Modeling Methodology Approach); however, some of the projects in Appendix D-1 are considered regional and are not explicitly mentioned as being part of the No Build Alternative.

Also see Section 3.4.2.1 for information on changes to existing left-turn locations since the traffic analysis conducted for the Draft EIS/EIR.

3.2.2.2.1 LAND USE ASSUMPTIONS

The project uses Association of Bay Area Governments' (ABAG) Projections *2009* land use assumptions with San Francisco Planning Department allocations for future year analysis, i.e., projections for future years made by ABAG in 2009. *Projections 2009* was used for analysis of Geary BRT project because these were the most recent official land use forecasts available at the time when travel demand modeling was conducted. More recent land use projections have since been released by ABAG, however, as found in Appendix D-1 and D-2, those more recent projections would not affect the conclusions in the Draft EIS/EIR or Final EIS. Additional explanation of land use assumptions and a comparison between 2009 projections and more recent projections are provided in Appendix D-1 and Appendix D-2.Appendix D2-1's 2009 projections were revalidated before publication of the Draft EIS/EIR, and revalidated again as part of the Final EIS work in Appendix D2-2 (2017 Land Use Validation).

ABAG's land use assumptions anticipate significant growth in San Francisco's eastern neighborhoods, but minimal land use change in much of the study area and in the Richmond District in particular. One location within the study area where significant growth is anticipated prior to the project opening year is in the vicinity of Geary Boulevard and Van Ness Avenue where the California Pacific Medical Center (CPMC) Cathedral Hill campus is under development. Table 3.2-1 below summarizes key land use values for each analysis year.

Table 3.2-1 ABAG Projections (2009) Population and Employment Forecasts with SF Planning Department Allocation

GEOGRAPHY		EXISTING CONDITIONS (2012)	OPENING YEAR (2020)	2020 PCT CHANGE FROM EXISTING	HORIZON YEAR (2035)	2035 PCT CHANGE FROM EXISTING
Study Area	Households	75,600	77,400	2%	80,700	7%
	Household Population	151,900	154,900	2%	160,600	6%
	Employed Residents	78,900	80,600	2%	90,900	15%
	Jobs	89,500	96,100	7%	116,600	30%
San Francisco	Households	346,500	361,500	4%	415,200	20%
	Household Population	788,000	821,900	4%	960,600	22%
	Employed Residents	411,100	426,600	4%	543,800	32%
	Jobs	570,000	611,800	7%	807,800	42%

Source: ABAG, 2009

Opening Year – 2020

In 2020, study area population, households, and employed residents are projected to be 2 percent greater than in existing conditions (2012). In the same year, the number of jobs located in the study area is expected to be 7 percent greater than existing conditions. Much of the growth in residents and employment will be concentrated at the eastern end of the Geary corridor. The CPMC Cathedral Hill campus accounts for much of the forecasted growth in employment. This tabulation of the study area extends from the ocean to Powell Street and excludes the Financial District, SoMa, and the Transbay Transit Center area. Significant growth in both population and employment is forecasted for these downtown neighborhoods that are adjacent to the Geary corridor bus routes, but east of Powell Street. More information about the use of ABAG's *Projections 2009* land use assumptions to represent opening year conditions is provided in Appendix D-1.

Horizon Year – Year 2035

Between 2020 and 2035, population and employment growth in the study area is expected to continue to trail growth throughout San Francisco. About 20 percent more people and households in San Francisco are projected for 2035 than in 2012. The number of employed residents is anticipated to be greater by almost one-third than the total number of jobs in San Francisco, and that number is projected to be over 40 percent higher than in 2012. In 2035, the study area is expected to house 7 percent more households and 6 percent more people than in 2012. The number of employed residents and jobs located in this area are forecasted to increase by 15 percent and 30 percent, respectively.

3.2.2.3 | FUTURE TRAVEL DEMANDS

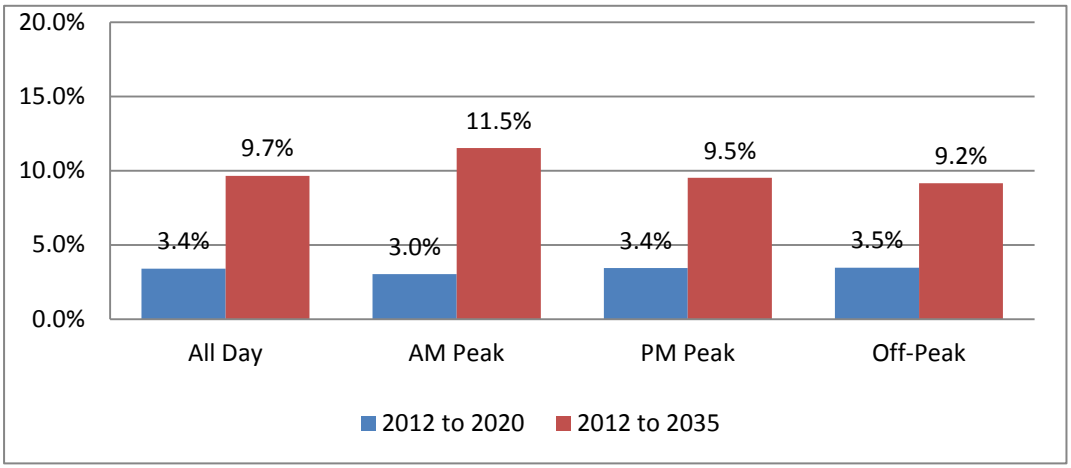
In the period between 2012 and 2020, total daily person trips to, from, or within the study area are forecasted to increase by about 3.5 percent, or 41,000, from 1.05 million to about 1.09 million (under No Build Alternative conditions). Factors contributing to growing trip-making include densification of land use in the San Francisco Bay Area and improvements to the transportation system, such as the Van Ness Avenue BRT project, the Central Subway Project, and more frequent transit

service along the Geary corridor. New trips are projected to occur at all times of day, but off-peak trips – those occurring outside of the morning and evening rush-hour commute periods – are expected to increase slightly faster than trips during the commute periods (see Figure 3.2-6). Almost half (47 percent) of the new trips in 2020 are anticipated to be made on public transit. About 12,000 new trips (30 percent) are forecasted to be auto trips, and the remainder are expected to be walking and bicycle trips. Relative to existing travel, transit ridership is projected to grow the fastest, at about 8 percent (2012 to 2020). Walking and biking is projected to increase by about 3 percent, and driving is forecasted to increase by 2 percent (see Figure 3.2-7). Between 2012 and 2020, the share of weekday daily trips on transit is expected to increase from 23 to 24 percent (see Figure 3.2-8). The share of auto trips is projected to not change substantially and remain at 48 percent. Walk and bike mode shares, 27 percent and 2 percent, respectively, are not expected to change significantly.

Between 2020 and 2035, also under No Build Alternative conditions, weekday total person trips to, from, or within the Geary corridor are forecasted to continue to increase. In 2035, daily total person trips are projected to be about 118,000 greater than in existing conditions, and almost 77,000 greater than in 2020. Unlike the period between 2012 and 2020, off-peak trips are not expected to grow as rapidly between 2020 and 2035. Instead, a.m. and p.m. commute-period trips are anticipated to grow faster. The anticipated higher growth of commute-period trips in 2035 is caused by a large increase in forecasted employment in the study area that occurs between 2020 and 2035. A 30 percent increase in the number of jobs located within the study area in 2035 (relative to existing conditions) is the driving force behind the 11.5 percent growth in a.m. peak period trips to, from, or within the study area during the same time. Of the new trips expected to occur in 2035 (relative to 2020), about half (49 percent) are anticipated to be new driving trips and about 30,000 (39 percent) and anticipated to be new transit trips. Although driving trips are forecasted to increase by more than any other mode, transit is projected to continue to experience the highest growth rate (see Figure 3.2-7). Transit trips are expected to grow by 12 percent from 2020 to 2035, while auto trips are anticipated to increase by 7 percent and non-motorized trips by 3 percent. Figure 3.2-8 shows future mode splits for all daily travel in the study area for 2020 and 2035.

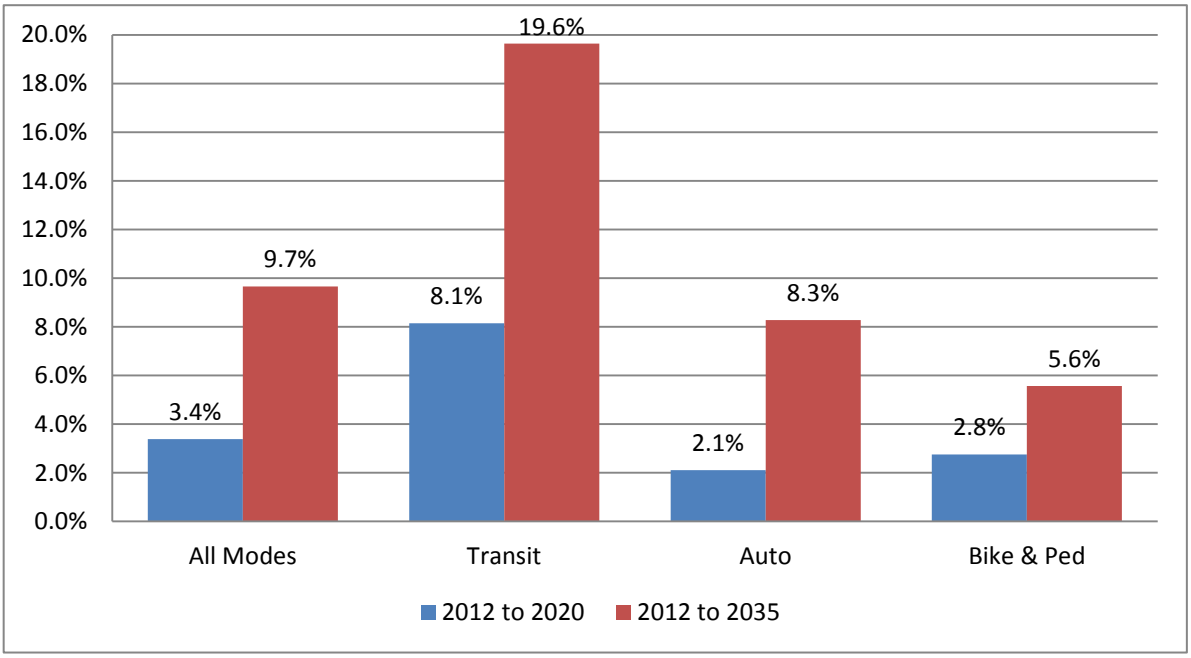
The study area can be subdivided into four subdistricts to analyze how travel patterns will change in different parts of the corridor. The four subdistricts are Outer Richmond, Inner Richmond, Japantown, and the Tenderloin. A fifth subdistrict, Downtown, is not analyzed in the same fashion because most trips to and from Downtown are not related to the Geary corridor. Figure 3.2-9 presents a map of the four subdistricts and the Downtown subdistrict.

Figure 3.2-6 Growth in Daily Trips To/From/Within the Study Area by Time of Day



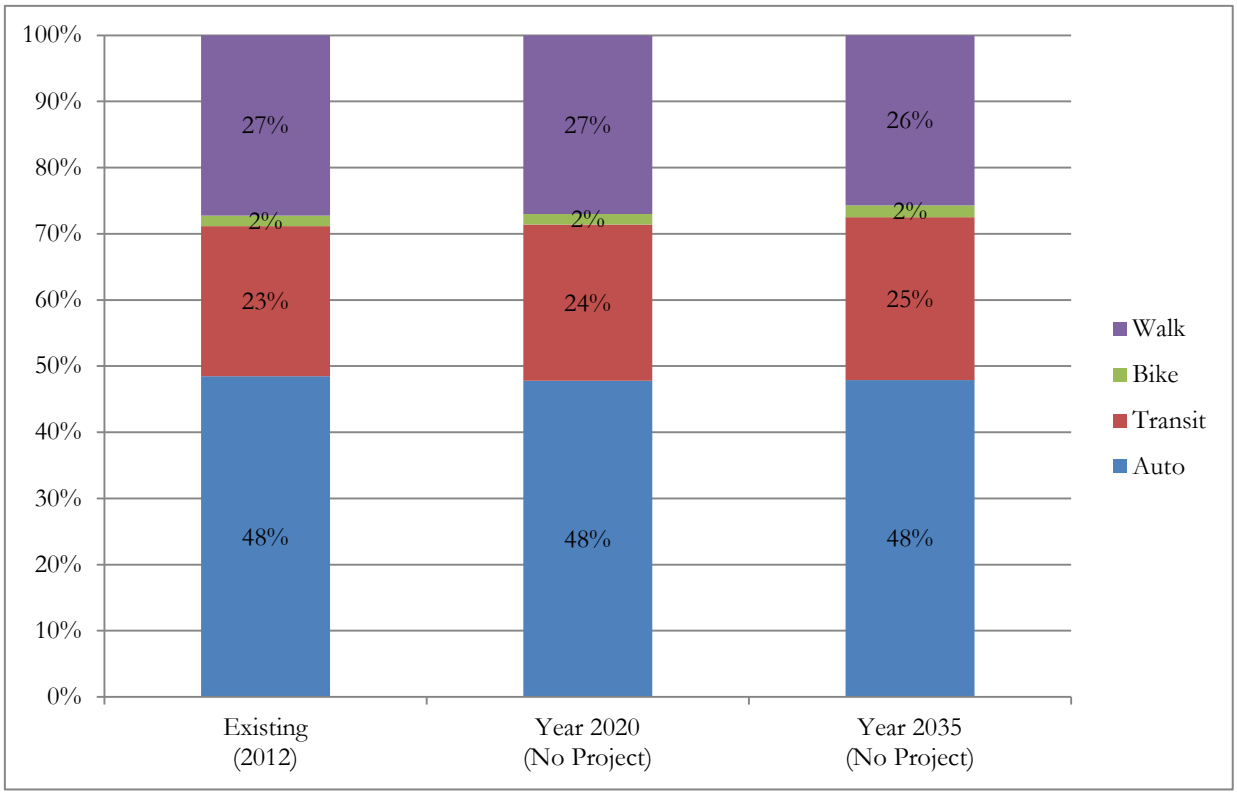
Source: CHTS 2012 and SF-CHAMP

Figure 3.2-7 Growth in Daily Trips To/From/Within the Study Area by Mode



Source: CHTS 2012 and SF-CHAMP

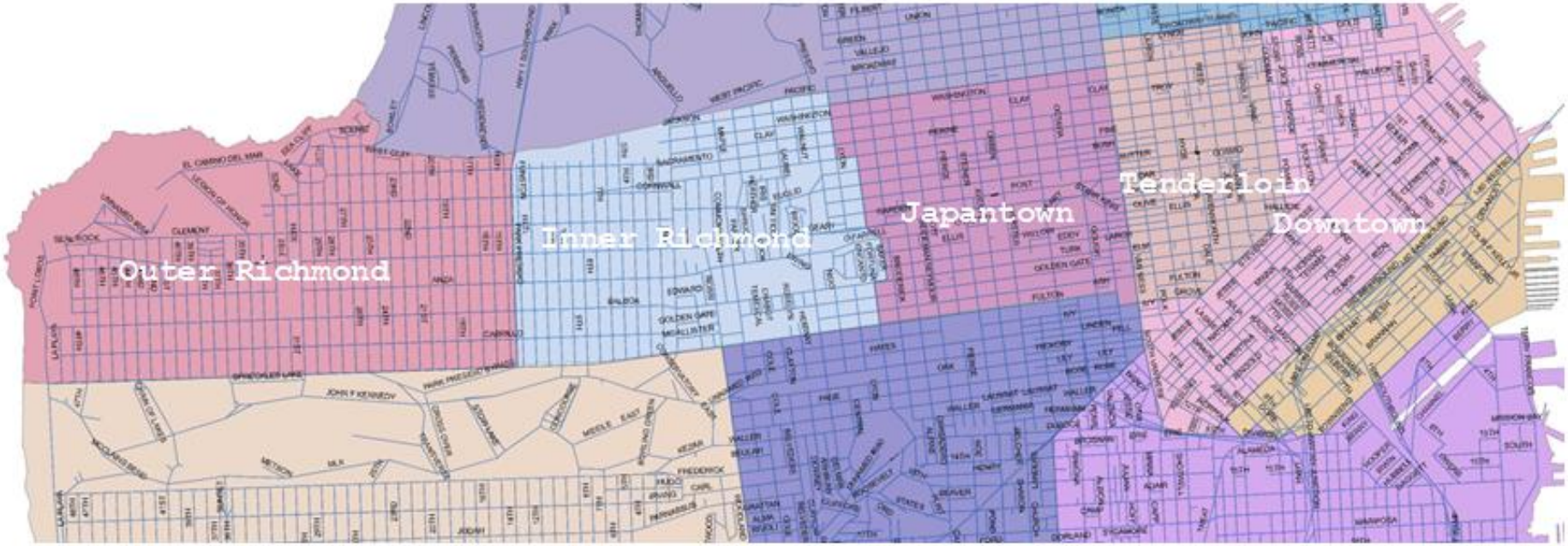
Figure 3.2-8 Daily Tripmaking Mode Share for Future Analysis Years (Daily Trips, to/from/within the Study Area)



Note: Percentages may not sum to 100 due to rounding.

Source: CHTS 2012 and SF-CHAMP

Figure 3.2-9 Subdistricts within the Study Area



Source: SFCTA, 2014

Table 3.2-2 shows the daily trips by destination for each district within the study area under existing conditions. This table shows the total number of trips to, from, and within each district and the percentage of those trips that fall into different destination/origin categories. Generally, about 15 percent of total trips that start or end in each district are trips that stay entirely within the study area (excluding the Downtown subdistrict). Another 25 percent of total trips that start or end within the study area subdistricts connect these subdistricts to the Downtown subdistrict.[3]

Table 3.2-2 Daily Trips by Origin/Destination for Each District within the Study Area (2012)

ORIGIN/DESTINATION	OUTER RICHMOND	INNER RICHMOND	JAPANTOWN	TENDERLOIN	DOWNTOWN
Trips To/From/Within District	221,000	258,000	349,000	520,000	908,000
Percentage of Trips Within District	16.5%	10.2%	8.5%	11.0%	14.8%
Percentage of Trips To/From West of District within the Study Area	--	9.5%	10.2%	13.3%	20.7%
Percentage of Trips To/From East of District within the Study Area and Downtown	26.8%	23.1%	24.5%	21.7%	--
Percentage of Trips To/From the Rest of San Francisco	44.0%	46.6%	46.7%	43.8%	41.0%
Percentage of Trips To/From the Rest of the Bay Area	12.6%	10.7%	10.1%	10.2%	23.4%

Source: SF-CHAMP.

Table 3.2-3 shows the growth in trips for each district by 2020, and Table 3.2-4 shows the growth in trips for each district by 2035. These tables show the additional trips to, from, and within each district, as well as the percent increase or decrease in trips under each origin/destination category. The greatest increase in trips is expected to be trips to or from areas outside of the study area. Excluding Downtown, the subdistrict with the greatest expected increase in trips will be Japantown, with 67,000 new trips, followed by the Tenderloin with 40,000 new trips by 2035.

[3] Note that the total trips of all four subdistricts sums to a number larger than the total number of trips to, from, or within the study area. This is because a trip that starts in one subdistrict and ends in another is counted in both subdistricts.

Table 3.2-3 Growth in Daily Trips from 2012 to 2020 by Origin/Destination for Each District within the Study Area

ORIGIN/DESTINATION	OUTER RICHMOND	INNER RICHMOND	JAPANTOWN	TENDERLOIN	DOWNTOWN
Additional Trips To/From/Within District	1,800	500	30,000	14,000	56,000
Growth Percentage of Trips Within District	-1.4%	-1.8%	10.2%	-0.8%	9.4%
Growth Percentage of Trips To/From West of District within the Study Area	--	-1.0%	4.2%	5.8%	4.1%
Growth Percentage of Trips To/From East of District within the Study Area	1.6%	1.9%	9.0%	2.9%	--
Growth Percentage of Trips To/From the Rest of San Francisco	1.7%	0.6%	9.6%	3.2%	6.3%
Growth Percentage of Trips To/From the Rest of the Bay Area	-1.0%	-2.4%	7.0%	0.5%	5.6%

Source: SF-CHAMP.

Table 3.2-4 Daily Trip Growth From 2012 to 2035 by Origin/Destination for Each District within the Study Area

ORIGIN/DESTINATION	OUTER RICHMOND	INNER RICHMOND	JAPANTOWN	TENDERLOIN	DOWNTOWN
Additional Trips To/From/Within District	10,000	14,000	67,000	40,000	190,000
Growth Percentage of Trips Within District	-0.9%	-0.4%	18.0%	-5.3%	27.5%
Growth Percentage of Trips To/From West of District within Study Area	--	-1.0%	9.6%	6.8%	8.0%
Growth Percentage of Trips To/From East of District within Study Area	2.1%	5.1%	14.7%	5.3%	--
Growth Percentage of Trips To/From the Rest of San Francisco	6.8%	7.2%	22.6%	11.2%	24.3%
Growth Percentage of Trips To/From the Rest of the Bay Area	9.8%	9.7%	24.0%	12.3%	22.6%

Source: SF-CHAMP.

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