

CHAPTER 10.0 INITIAL DEVELOPMENT AND SCREENING OF ALTERNATIVES

10.1 Introduction

This chapter describes the process to generate, develop, refine, and evaluate the project alternatives selected for further evaluation in the Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) (and the elimination of other options, configurations, and alternatives). This chapter also recounts the identification of the Staff-Recommended Alternative (SRA). Chapter 2 describes in detail the alternatives evaluated in the Draft EIS/EIR and this Final EIS.

The multi-year, multi-faceted process involved multiple rounds of design and analysis to identify the design configurations and service options that best respond to the project's purpose and need and to eliminate the lowest-performing concepts from further consideration.

The chapter is divided into two parts: the first describes the options considered previously that were not advanced as complete alternatives for consideration within the Draft EIS/EIR and this Final EIS; the second describes the process and analysis used to identify the SRA from among the alternatives evaluated within this document.

The Geary corridor is characterized by a variety of roadway configurations, traffic and ridership conditions, neighborhoods, and land uses along its length. The optimal physical street configurations and bus rapid transit (BRT) service options vary according to these characteristics and constraints. Accordingly, this analysis considers the optimal physical and service configuration by segment.

10.2 Configuration and Service Options Previously Considered and Rejected

10.2.1 | Previous Analysis Rounds

Previous rounds of planning design and analysis include the following:

- *The Geary Bus Rapid Transit Feasibility Study*, May 2007, focusing separately on configurations east and west of Gough Street.
- *The Geary Bus Rapid Transit Alternatives Screening Report*, May 2009, also focusing on configurations east and west of Gough Street.
- *The Geary Bus Rapid Transit Design Options Screening Report*, January 2014, focusing on configurations for east of Gough Street, the Masonic area, and the Fillmore area.

Each round produced multiple design options for various segments and locations along the corridor, ultimately recommending some for elimination and others to advance for further consideration. This section describes the configurations/service

options that were considered and eliminated from further analysis. The previous analysis rounds used the following criteria to evaluate potential options:

- Traffic conditions, including congestion, diversions, circulation, access, and parking, and loading conditions
- Transit travel time, reliability, and passenger experience and access
- Pedestrian access, safety, and streetscape design
- Bicycle safety and connectivity
- Rail readiness
- Capital and operating costs
- Impacts to Muni operations
- Construction impacts

10.2.2 | Corridorwide Configurations/Service Options

The BRT configurations that were considered would apply to particular segments of the Geary corridor, and are discussed geographically below. In addition, a rail option was considered for the entire corridor but, as described below, was withdrawn from further analysis.

Surface Rail, Underground Rail, and Combination. Under these suggested service options, a new light rail line would be constructed along the Geary corridor. The surface rail option would convert the leftmost travel lane in both directions to a dedicated transit lane operating adjacent to the existing, single, center median that would serve as a platform at the stations. The tunnel option would entail operating light rail vehicles in a tunnel underneath the Geary corridor. A combination of surface and underground rail that was explored would provide a transition point in the vicinity of Laguna Street.

These rail-based alternatives were considered in the 2009 Screening Report but did not advance for further analysis because of the high capital cost and commensurate difficulty in obtaining funds. Surface light rail capital costs are in excess of \$100 million per mile, and a subway project would cost over \$500 million per mile. Order-of-magnitude cost estimates place a surface rail project at \$2.5 billion and a surface-to-subway project at \$5 billion.

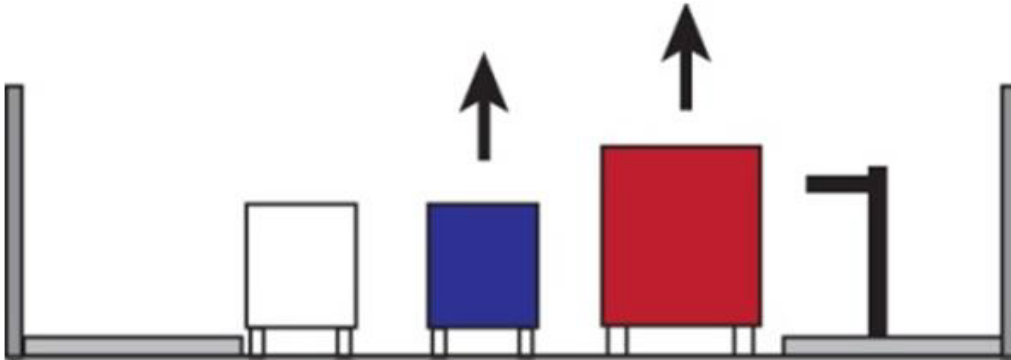
Although rail options are not currently feasible, rail construction could be pursued in the future if funding becomes available. The proposed BRT alternatives would not preclude future conversion of the corridor to rail, and the relative ease of doing so is included as a performance metric in the initial development and screening of alternatives.

10.2.3 | Inner Geary Configurations/Service Options

The Inner Geary area consists of Geary Street and O'Farrell Street, which form a one-way couplet from Market Street to Gough Street. The current configuration in this one-mile segment consists of an existing bus-only lane in each direction alongside one to three lanes of mixed-flow travel (see Figure 10-1). Loading opportunities and parallel parking are available on both of the streets. The street widths are considerably narrower than west of Gough Street.

During the alternatives screening process, the project team considered several possible configurations for BRT service through Inner Geary, eliminating the following options from further consideration:

Figure 10-1 Inner Geary existing configuration (buses shown in red, mixed traffic in blue)

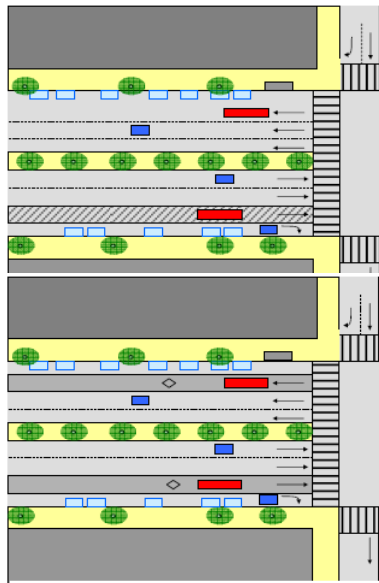
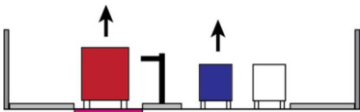


Two-Way Geary Bus-Only Transit Mall. This configuration would convert Geary to two-way operations, with Post Street reversed to become a one-way westbound street to serve through-traffic in tandem with the existing one-way O'Farrell Street. Transit services would be consolidated onto a two-way Geary Street reserved for transit only. The 2009 Screening Report dropped this configuration from further consideration because it would not provide significant transit performance benefits; it would have significant impacts to parking and loading; and it would require a major reorganization and redesign of transit and traffic circulation in the greater downtown, both north and south of Market Street. In addition to the substantial capital cost associated with these changes, this redesign of area-wide traffic patterns would require significant additional time and resources in order to undertake the necessary planning and design activities.

Two-Way Geary Bus-Only Lanes and Traffic Lanes. This configuration would require all of the changes to traffic circulation and street directionality included in *Two-Way Geary Bus-Only Transit Mall*. However, under this alternative, mixed-flow travel would be permitted on Geary Street. Buses would travel in designated transit lanes in each direction on Geary Street. A single travel lane would also be provided in each direction on Geary Street. Although auto access would be maintained, on-street parking would be generally eliminated in order to accommodate all four travel lanes. The 2009 Screening Report eliminated this configuration from further consideration because it would not provide significant transit performance benefits; it would have significant impacts to parking and loading; and it would require a major reorganization and redesign of transit and traffic circulation in the greater downtown, both north and south of Market Street. In addition to the substantial capital cost associated with these changes, this redesign of area-wide traffic patterns would require significant additional time and resources in order to undertake the necessary planning and design activities.

Two-Way Geary Partial Transit Mall. This configuration would also require all of the changes to traffic circulation and street directionality included in *Two-Way Geary Bus-Only Transit Mall*. However, under this alternative, auto access would be permitted for a certain segment or segments of Geary Street. The 2009 Screening Report eliminated this configuration from further consideration because it would not provide significant transit performance benefits; it would have significant impacts to parking and loading; and it would require a major reorganization and redesign of transit and traffic circulation in the greater downtown, both north and south of Market Street. In addition to the substantial capital cost associated with these changes, this redesign of area-wide traffic patterns would require significant additional time and resources in order to undertake the necessary planning and design activities.

Left-Side-Running Bus-Only Lanes with One-Sided Parking and Loading. This configuration would replace all parking and loading spaces along the left side of Geary Street and O’Farrell Street with a bus-only lane in each direction. This option would also prohibit left turns along this portion of the corridor, resulting in the elimination of bus conflicts with loading, parking, and turning vehicles. New island station platforms would be constructed to the right of the bus-only lane. This design option was dropped from consideration due to its significant parking and loading impacts on businesses along this portion of the corridor, which include major hotels, regional retail, and performing arts venues. Most on-street spaces in this corridor segment are designated for commercial and passenger loading, and there is no feasible way to replace all of the lost loading areas.



10.2.4 | West of Gough Configurations/Service Options

The following are configuration options applicable to segments West of Gough Street, all of which were considered but withdrawn from further analysis.

Peak-Period/Direction Bus-Only Lanes. This alternative would provide a designated lane in the rightmost travel lane that would be reserved for buses only during the peak period in the peak direction. As documented in the 2009 Screening Report, this alternative did not advance for further analysis because Geary transit experiences delays and reliability problems throughout the day and in both directions, and transit ridership on Geary is robust throughout the day, not just during peak periods.

Striping-Only Bus Lanes. This alternative would extend the existing bus-only lanes on Geary and O’Farrell Streets to Geary Boulevard, converting the right-most lane to exclusive all-day bus use. No bus bulbs would be included. As documented in the 2009 Screening Report, this alternative did not advance for further analysis because without a more prominent treatment for the bus-only lane, the design would not be effective in preventing auto vehicles from using the lane.

One-Sided Bus-Only Lanes. Buses would run in adjacent dedicated transit lanes on one side of the street. Other vehicles would operate in both directions on the other side of the street with two mixed-flow travel lanes in each direction. As documented in the 2009 Screening Report, this alternative did not advance for further analysis because it would require a highly complex street configuration, with

degraded pedestrian safety. Pedestrians crossing Geary would have to cross a wide street in which traffic directionality switches more than once, creating confusion as buses and mixed traffic approach from unfamiliar and alternating directions. Motorists utilizing the on-street parking adjacent to the busway would likely jaywalk across the transit lanes to reach the sidewalk. The alternative would eliminate loading on one entire side of the street and cause greater traffic and circulation impacts because of the need to provide protected signal phases for both left and right turn movements.

Center-Running Bus-Only Lanes with Center Platforms (Left-Side Loading).

Under this alternative, the leftmost travel lane in each direction would be converted into a dedicated BRT lane. Buses would operate adjacent to the existing single center median, which would serve as a platform at the stations, and waiting passengers would be buffered from auto traffic by BRT lanes. This alternative would be operated using five-door buses with doors on both sides of the bus, because the median platform would be located on the left side of the bus.

Although the 2009 Screening Report indicated several potential performance benefits of this configuration, this alternative ultimately did not advance for further analysis because of its special vehicle requirement. The San Francisco Municipal Transportation Authority (SFMTA) maintains a large and complex vehicle fleet at nine facilities distributed across San Francisco, all of which are capacity-constrained. In part because of these capacity constraints, SFMTA does not operate sub-fleets – all 60-foot motor coaches must be interchangeable such that they can be used on any bus line that operates 60-foot motor coaches. Flexibility in spare vehicles is needed such that they can be used on all lines that operate 60-foot motor coaches.

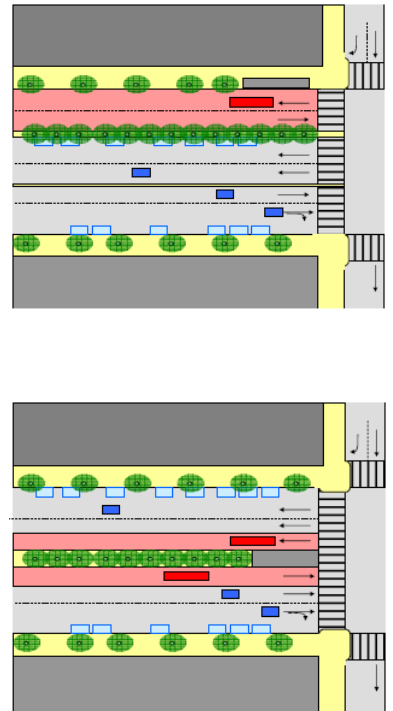
Because this configuration would require left-side loading of buses, the only buses that would be able to operate on the Geary corridor would be five-door buses (i.e. buses with doors on both sides), effectively creating a 60-foot-motor-coach sub-fleet for the first time. This constraint would drastically reduce the flexibility for SFMTA to substitute buses on the other 60-foot motor coach bus lines, and conversely, Geary would require a much higher spare vehicle ratio because only the five-door buses would be able to operate on Geary. Further, SFMTA would potentially need to modify its maintenance facilities to accommodate five-door buses, which would pose a logistical challenge considering the already-existing constraints.

There is also a durability concern. Five-door buses are relatively new in the industry in the United States. There are few five-door bus fleets in operation in the United States including in Eugene, Oregon, and Cleveland, Ohio, both of which experience less adverse conditions, including flat terrain and at least 70 percent fewer boardings.

Given the logistical challenge of accommodating a new type of bus in its maintenance facilities, the implications of operating a sub-fleet including loss of flexibility and increased risk relating to availability of spare vehicles, SFMTA’s Operations Support group has determined that five-door vehicles are not a viable option for the agency at this time.

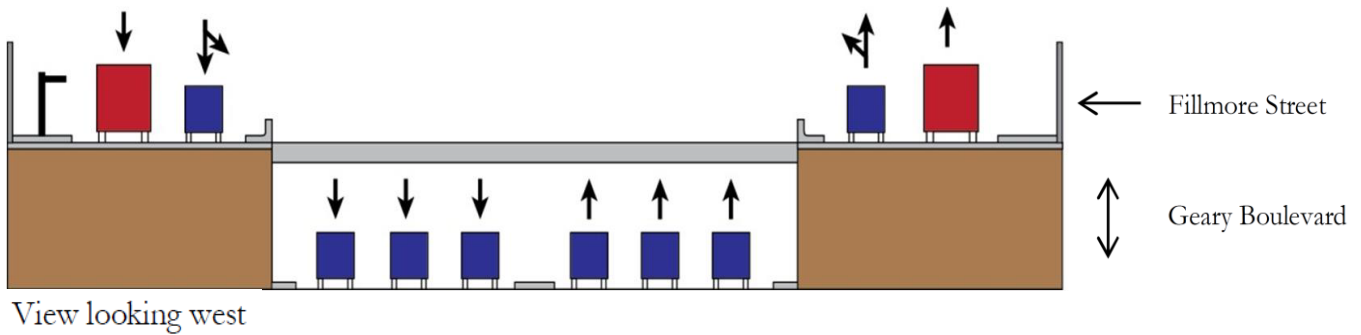
10.2.5 | Fillmore Underpass Area Configurations

The Fillmore Street underpass at Geary Boulevard represents a major engineering constraint for implementing BRT service. As shown in Figure 10-2, the existing

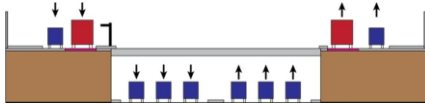


facility includes six travel lanes located in a trench, over which crosses a bridge carrying Fillmore Street. A side service road in each direction diverges from the main Geary travelway, connecting to Fillmore Street at street grade before descending to meet the main Geary travelway again. This configuration poses a challenge for providing a bus-only lane as well as a station stop at Fillmore that sees high transfer activity between the 38 Local service and the 22 Fillmore line. In particular, the potential designs are constrained by the narrow width of the service roads and underpass grades that are not level enough to accommodate center platforms with the existing configuration.

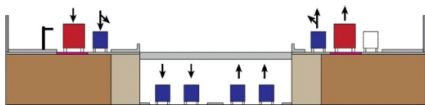
Figure 10-2 Fillmore underpass existing configuration (buses shown in red, mixed traffic in blue)



During the alternatives screening process (and as documented in the 2014 Screening Report), the project team considered nine possible configurations for BRT service through the Fillmore underpass area, eliminating each of the following options from further consideration for the reasons stated below:



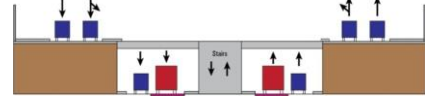
Bus-Only Lane with Cantilevered Stations. This design option would cantilever the station platforms over the underpass to provide additional platform space. The cantilever would be modest, lining up with the curb in the underpass to minimize impact on vertical clearance for vehicles in the underpass. The service road would be widened to accommodate this arrangement. In terms of traffic operations, the BRT buses would travel on the inside lane of the frontage roads, thereby traffic in each direction would be retained in the underpass. This design option was dropped from consideration due to its significant cost, anticipated low benefits, structural infeasibility, and financial burden to San Francisco Public Works (SFPW).



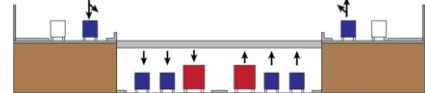
Bus-Only Lane in Widened Service Road. The service roads in this design option would be widened by approximately 10 feet, which would allow some space for a modest plaza on the north side and parking on the south side of the intersection. The service roads would have one lane for bus-only operations and another mixed-flow lane in both directions. The expansion of the service road would result in a commensurate decrease in the underpass's width, which would subsequently only have enough right-of-way for two lanes of mixed-flow traffic in each direction. From Webster to Steiner Streets, some parking spaces would be removed and sidewalks would be widened. This design option was dropped from consideration due to its significant cost, anticipated low life-cycle benefits relative to costs, structural

burden to the Fillmore bridge, impact to the existing drainage system, and financial burden to SFPW.

Bus-Only Lane and Station in Underpass. This design option would involve moving all Geary bus operations to the underpass. A bus station would be underground and passengers would change levels to transfer between the Geary and Fillmore buses. To implement this design option, the underpass would need to be modified to accommodate the new underground station platforms. One mixed-flow lane in each direction would operate in the underpass adjacent to the bus-only lane. The service roads on both sides of Geary Boulevard would each have one mixed-flow lane and a parking lane. This design option was dropped from consideration due to its design infeasibility. The 8 percent grade in the underpass would not provide a sufficient level boarding area for a 180-foot BRT station and platform. This grade of steepness would also not allow for construction of accessible platforms for a potential rail project in the future, and improvements proposed for the project must not preclude the possibility of future rail construction, as mandated by Proposition K.



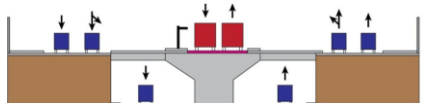
Bus-Only Lane in Underpass with Stations at Webster. Given the physical constraints of the service roads and the high volume of activity and congestion at the Fillmore intersection, this design option would shift the existing Geary bus stops from Fillmore to Webster Street. This modification would provide more physical space for the bus stops. The Geary buses would operate through the underpass in bus-only lanes and bypass the Fillmore intersection altogether to pick up or drop off passengers at Webster Street. Two mixed-flow lanes in each direction would be retained in the underpass, and the service roads would each have one mixed-flow lane and a parking lane. This design option was dropped from consideration since it would disrupt a key transfer location for bus riders using the Geary lines and the 22 Fillmore line. SFMTA has also stated its preference not to make major changes for the 22 Fillmore route at this location.

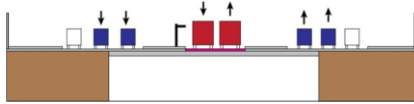


Bus-Only Lane and Stations in Extended Underpass. This design option would extend the Fillmore underpass past Webster and Steiner Streets. As a result, the stretch between these two streets would be at-grade. Fillmore, Steiner, and Webster Streets would subsequently be reconnected, with only the service roads separating the Japantown and Western Addition neighborhoods. The new street-level space could accommodate open space uses (e.g., pocket parks, bicycle paths) or air rights development. This design option was dropped from consideration due to its long construction timeframe and very high estimated costs that are not commensurate with the anticipated benefits.

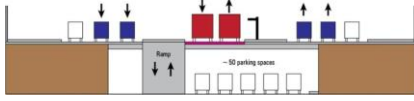


Bus-Only Lane on Viaduct. This design option would construct a bus-only lane at the surface level of the Fillmore intersection for buses to operate in the center of the road. This would be achieved by raising the grade of the center lanes of the underpass (likely using a combination of fill and structure) to create a relatively flat grade for transit operations. The Geary bus stations would be located on street-level plazas. Two mixed-flow travel lanes would be retained in the underpass in each direction, as well as one service road in each direction. This design option was dropped from





consideration due to the restricted vertical clearance over traffic created by the construction of the viaduct, high cost, adverse impacts to emergency access, and impacts to the existing drainage system. In addition, the relocation of the existing 22 Fillmore bus stops is operationally not acceptable to SFMTA.

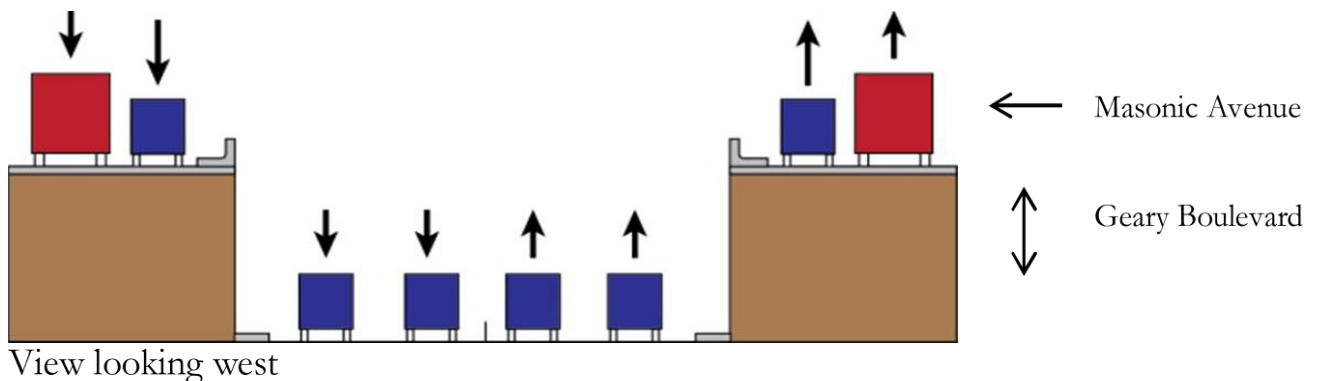


Bus-Only Lane on Deck (option: underground parking). This design option would deck the existing underpass, and all traffic would operate on the street level. Two mixed-flow travel lanes and a parking lane in each direction would be created by the removal of the existing service road. In an optional variant, the space under the deck would be converted to parking. This design option was dropped from consideration due to its significant cost and operations risks. In particular, the design would create an undesirable under-bridge environment that would need to be ventilated, kept dry, and lit for regular maintenance and inspection. This design would likely result in significant operations and maintenance costs as well as significant risk of BRT service disruption when the deck reaches the end of its useful life. In addition, surface access to the garage was not considered feasible and the construction costs per parking space would be very high.

10.2.6 | Masonic Area Underpass Configurations

The Masonic Avenue underpass (or tunnel) below Geary Boulevard and Presidio Avenue represents a second major physical constraint on potential configurations for BRT service in the corridor. As shown in Figure 10-3, two mixed-flow travel lanes through the tunnel in each direction. As at Fillmore, a side service road in each direction diverges from the main Geary travelway, connecting to the intersections with Masonic Avenue and Presidio Avenue at street grade before descending to meet the main Geary travelway again. Buses on Geary operate on the side service roads, which also accommodate car traffic and parking.

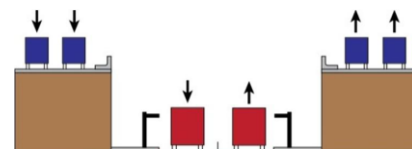
Figure 10-3 Masonic underpass existing configuration (buses shown in red, mixed traffic in blue)



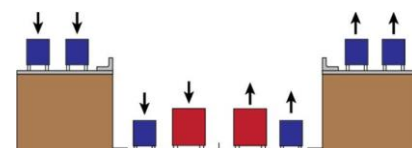
During the alternatives screening process (and as documented in the 2014 Screening Report), the project team considered eight possible configurations for BRT service through the Masonic underpass. Major alterations to the tunnel structure were not considered because, compared to the Fillmore underpass, the Masonic tunnel is longer and the underpass travelway is narrower. Therefore, there is less flexibility to reconfigure the facility and major alterations would generally be even more costly

than at Fillmore. During the screening process, the following configuration options were eliminated from further consideration:

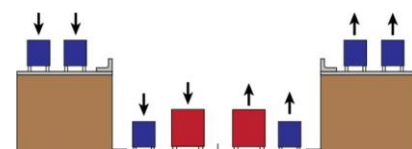
Center-Running Bus-Only Lane in Tunnel with Mixed Traffic at Surface. This design option would shift all bus operations to bus-only lanes in the tunnel and re-locate the bus stops to the trench on either side of the tunnel. All other vehicles would be moved to the surface service roads with two mixed-flow lanes in each direction. Parking would be removed on the service roads to accommodate mixed-flow traffic. This design option was dropped from consideration due to the undesirability of the below-grade bus stop location as well as the significant reduction in auto capacity. As the number of mixed-flow lanes would be reduced, traffic congestion and queuing would likely increase and private automobiles would likely divert to alternative routes.



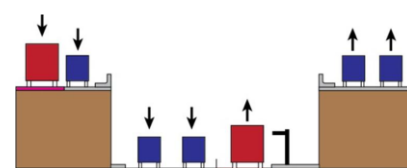
Center-Running Bus-Only Lane and Mixed Traffic in Tunnel, No Stops. Bus-only lanes would be located in the tunnel in this design option. Buses would not stop in the tunnel or approaches, and the existing surface Geary bus stops would either be eliminated or relocated to the west and/or east of the tunnel approaches. For general traffic, one mixed-flow lane in each direction would remain for through auto travel in the tunnel, and local traffic would use two mixed-flow lanes in each direction on the surface streets. Parking would be removed on the service roads to accommodate eastbound and westbound mixed-flow traffic. This design option was dropped from consideration due to the proposed removal or re-location of existing bus stops, which would make the heavily-used transfer to the 43-Masonic route much more difficult.



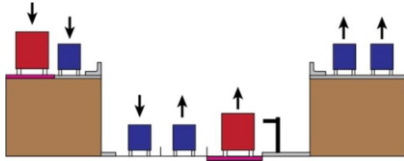
Center-Running Mixed-Flow Lanes in Tunnel, No Stops. In this design option, two mixed-flow lanes would be located in each direction in the tunnel and two mixed-flow lanes would be located in each direction on the service roads. The Geary buses would operate in the centermost mixed-flow tunnel lanes in both directions instead of having their own dedicated right-of-way (i.e., a bus-only lane). Buses would not stop in the tunnel or approaches, and the existing surface Geary bus stops would either be eliminated or relocated to the west and/or east of the tunnel approaches. Some parking on the service roads would be maintained, as most traffic demand would be accommodated in the tunnel’s mixed-flow lanes. This design option was dropped from consideration due to flaws related to the proposed removal or re-location of existing bus stops, which would make the heavily-used transfer to the 43-Masonic route much more difficult.



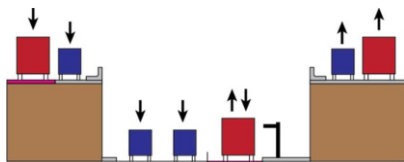
Westbound Bus-Only Lane in Tunnel with One-Way Traffic. In this design option, the eastbound Geary buses would travel in a bus-only lane on the surface service road, while westbound Geary buses would operate in a bus-only lane in the tunnel. Stops would continue to be located at Masonic Avenue, with the westbound bus stop located in the trench adjacent to the tunnel. Eastbound traffic would use two mixed-flow lanes in the tunnel in the eastbound direction and one mixed-flow lane on the service road. Westbound traffic would travel on the surface in two mixed-flow lanes on the service road. Parking would be removed on the service roads to accommodate the eastbound bus-only lane and westbound mixed-flow



traffic. This design option was dropped from consideration due to the undesirability of the below-grade bus stop location as well as the significant reduction in westbound auto capacity. As the number of mixed-flow lanes would be reduced, traffic congestion and queuing would likely increase and private automobiles would likely divert to alternative routes.



Westbound Bus-Only Lane in Tunnel with Two-Way Traffic. In this design option, eastbound Geary buses would travel in one bus-only lane on the service road, while westbound Geary buses would operate in one bus-only lane in the tunnel. Stops would continue to be located at Masonic Avenue, with the westbound bus stop located in the trench adjacent to the tunnel. For general traffic, there would be one mixed-flow lane in each direction for through traffic in the tunnel; one mixed-flow lane on the service road for eastbound travel; and two mixed-flow lanes on the service road for westbound travel. Parking would be removed on the service roads to accommodate the eastbound bus-only lane and westbound mixed-flow traffic. This design option was dropped from consideration due to the undesirability of the below-grade bus stop location as well as the reduction in auto capacity.



Reversible Bus-Only Lane in Tunnel with One-Way Traffic. In this design option, one bus-only lane would be available for eastbound buses on the surface road, and a reversible bus-only lane would be placed in the tunnel. The operating direction for the reversible lane would likely be eastbound during the morning peak hours and westbound in the evening peak hours, which would require using buses with doors on the left-hand side. While westbound BRT buses would also travel on a curbside, mixed-flow lane on the surface, there would not be a bus-only lane in the westbound direction on the surface side street. Stops would continue to be located at Masonic Avenue, with the reversible lane's bus stop located in the trench adjacent to the tunnel. For general traffic, only eastbound through traffic could travel in the tunnel; eastbound local traffic would use the mixed-flow lane on the service road; and westbound traffic would travel on the surface in two mixed-flow lanes on the service roads. Parking would be removed on the service roads to accommodate the eastbound bus-only lane and westbound mixed-flow traffic. This design option was dropped from consideration due to the undesirability of the below-grade bus stop location as well as the significant reduction in auto capacity.

10.3 Analysis of Configurations and Combinations, Identification of Staff-Recommended Alternative

This analysis compares the performance of the potential project configurations on key performance criteria. As part of the process to identify a staff recommendation for a Locally Preferred Alternative (LPA) (i.e., the SRA), both the alternatives analyzed in the Draft EIS/EIR as well as a number of additional potential hybrid configurations were considered and are discussed in this analysis. The process described here focused on refining the set of build alternatives for analysis in the Draft EIS/EIR, including eliminating some from consideration, before comparing the alternatives' performance with the No Build Alternative.

10.3.1 | Alternatives and Combinations Considered

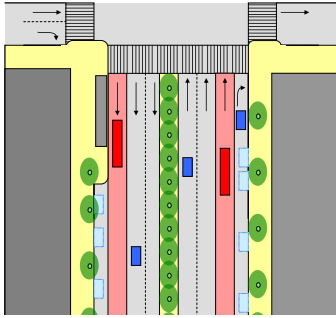
Three corridor-length build alternatives that could potentially meet the project purpose were initially developed for environmental analysis based on all of the previous development and screening efforts: Alternative 2, Alternative 3, and Alternative 3-Consolidated, described briefly here and in more detail in Chapter 2. These are known as the “pure” alternatives, because they feature a single bus-only lane configuration for most of the project alignment along Geary Boulevard.

All of these build alternatives would share similar configurations east of Gough Street and west of 27th Avenue. Under all alternatives, buses would continue to travel east along Market Street and connect to the Transbay Transit Center. The Better Market Street project is evaluating configuration options for that street, and no physical changes are proposed to this portion of the corridor as part of the BRT project.

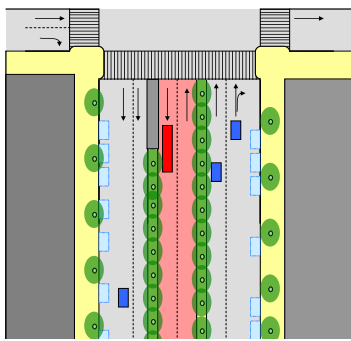
East of Gough Street, all of the evaluated build alternatives would retain the existing right-side-running bus-only lanes on Geary Street and O'Farrell Street and extend them to Market Street. The alternatives also include “spot improvements” in this corridor segment, including lane reconfigurations and queue jump signals, to reduce bus conflicts with turning traffic at key locations. This was the only option retained during the screening process, which eliminated options with reduced transit benefits or greater potential impacts.

West of 34th Avenue, both bus ridership and traffic congestion are significantly less than in the rest of the corridor, rendering bus-only lanes less beneficial. In this segment, BRT vehicles would continue to travel in the existing mixed-flow lanes, and no changes would be made to existing stops. Between 34th Avenue and 27th Avenue, BRT improvements including bus-only lanes would be beneficial. However, more costly center bus-only lanes are not warranted, so all of the build alternatives would install a bus-only lane along the side of the street in this section of the corridor.

The build alternatives would differ between 27th Avenue and Gough Street as follows:



Alternative 2: Side-Lane BRT. In this alternative, BRT service would replace the existing 38 Geary Rapid service and operate in dedicated side-running bus-only lanes. Alternative 2 would retain both BRT/local and local-only stops, similar to the existing configuration. At the Masonic and Fillmore underpasses, this alternative would convert the parking lanes along the service roads to bus lanes, where feasible, to continue the side-running configuration through these constrained areas. The previous screening analyses identified side-running lanes as generally feasible throughout all segments of the corridor and likely to provide more moderate transit performance benefits at reduced cost compared to center-running options.



Alternative 3: Center-Lane BRT with Dual Medians and Passing Lanes. This alternative would convert the existing median and two centermost mixed-flow lanes into adjacent bus-only lanes separated from traffic by two side medians. Station platforms would be located in the two medians, and buses would load from the right side. Alternative 3 would retain both BRT/local and local-only stops, similar to the existing configuration.

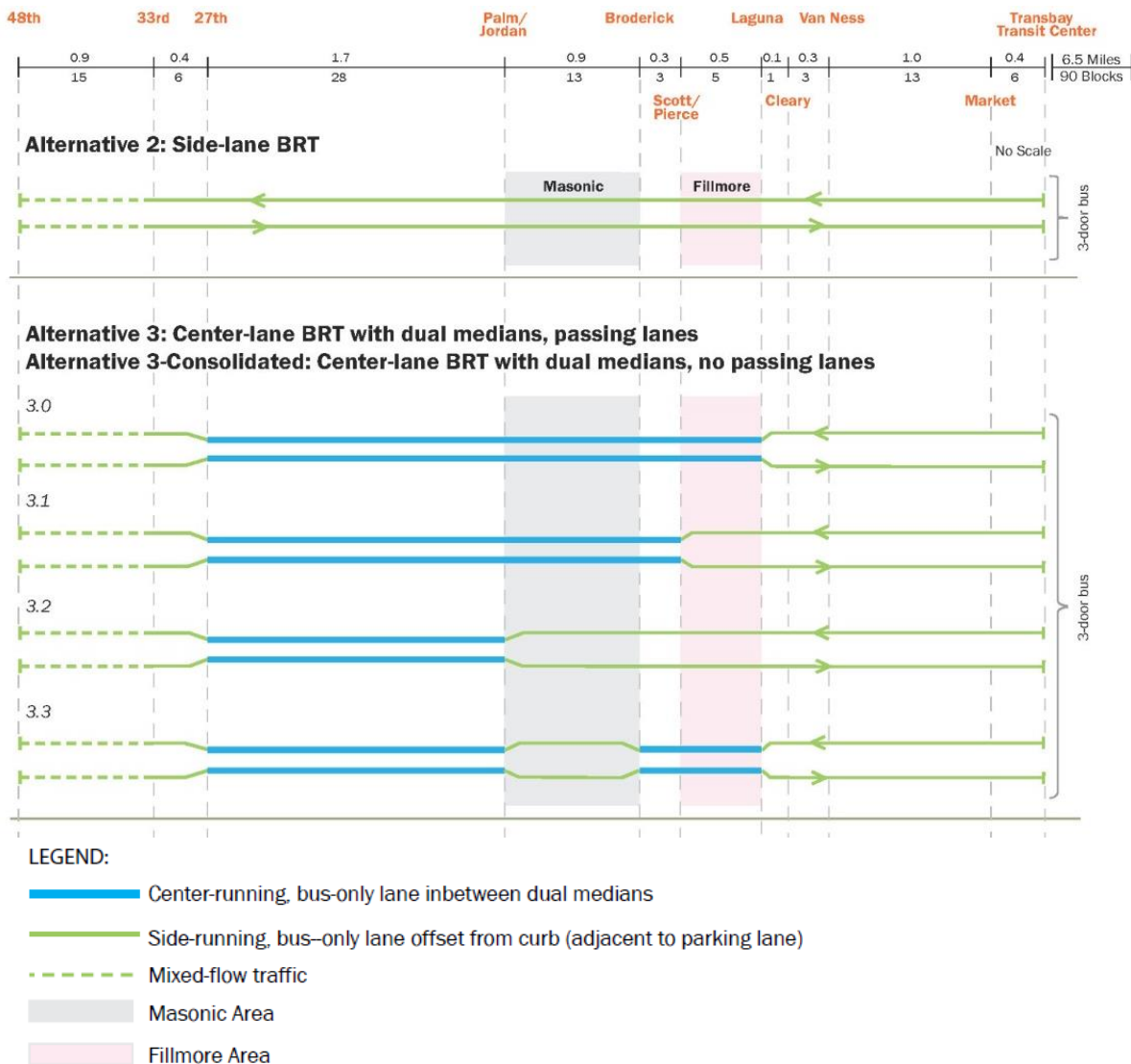
This alternative would include center-running bus lanes through the Masonic underpass with the eastbound stop at Masonic Avenue and the westbound stop at Presidio Avenue. One westbound travel lane would remain in the tunnel. Additional westbound and all eastbound traffic would utilize the surface service roads, with elimination of parking lanes and two surface travel lanes in each direction through this portion of the corridor. This Masonic underpass configuration was retained through the screening analysis due to the transit travel time advantage of utilizing the tunnel. At Fillmore Street, the screening process determined that to maintain a direct connection to the 22 Fillmore, center-running bus-only lanes are only feasible if the existing underpass is filled in. Thus, Alternative 3 would include filling the Fillmore underpass.

Alternative 3-Consolidated: Center-Lane BRT with Consolidated Bus Stops, Dual Medians, and No Passing Lanes. In addition to the BRT alternatives identified during the scoping and screening process, the project team developed one additional variant in response to public input. Alternative 3-Consolidated would have a similar configuration to Alternative 3, with center-running bus-only and dual medians, but would consolidate local and rapid stops throughout the corridor. All buses would serve all stops. As with Alternative 3, center-running bus-only lanes would utilize the Masonic underpass but would necessitate filling the Fillmore underpass. The consolidated-stop variant was developed because it would require significantly less parking loss to implement center-running BRT than would Alternative 3, and would thereby help address merchant concerns about the project.

As these “pure” alternatives were developed, the agencies determined that a single “pure” configuration for the entire corridor need not be selected as the LPA; different configurations could be selected for different portions of the corridor, resulting in a significantly larger set of potential combinations. The range of feasible design combinations, including both “pure” and “hybrid” configurations, is shown in Figure 10-4. It includes three configurations that combine segments of center-running and side-running bus-only lanes, designated combinations 3.1, 3.2, and 3.3, which also have consolidated-stop variants, designated 3.1C, 3.2C, and 3.3C.

This initial development and screening of alternatives considered these options based on a set of evaluation criteria, and uses the results of the “pure” alternatives analysis to estimate the performance of potential hybrid options. It eliminated some options based on fatal flaws or low performance, and identified an SRA based on the performance of the remaining options.

Figure 10-4 Geary BRT Project Alternatives and Combinations Under Consideration



Based on the initial estimates indicating its strong performance, the SRA was ultimately included as an alternative in the full environmental analysis. The following describes the staff-recommended configuration:

Hybrid Alternative/(Alternative 3.2C). This alternative represents a combination of the Alternative 2 and Alternative 3-Consolidated configurations. For most of the corridor, it would utilize the Alternative 2 design, with new side-running bus-only lanes from 34th Avenue to 27th Avenue and from Palm Avenue (just east of Arguello Boulevard) to Gough Street. Between 27th Avenue and Palm Avenue, the Hybrid Alternative would utilize the Alternative 2.3-Consolidated configuration, with center-running bus-only lanes and consolidated local and BRT stops. Local and BRT stops would also be consolidated in the segments of the corridor between 34th Avenue and 27th Avenue and between Palm Avenue and Masonic Boulevard. Both local and BRT services would exist with this alternative, but both would make all stops in the consolidated-stop portion of the corridor. In the following evaluation, which includes multiple hybrid configurations, this alternative is referred to as Alternative 3.2C. In all other chapters, it is referred to as the Hybrid Alternative/LPA (and includes a subsequent modification to extend the westbound bus-only lane to 28th Avenue, rather than 27th Avenue).

10.3.2 | Evaluation Criteria

This section and Table 10-1 present the key performance indicators used to inform the selection of the staff-recommended alternative. These metrics were selected because they: 1) Are related to the project purpose and need or to key issues identified by the public and other stakeholders, and 2) Were expected to show varying levels of performance between the build alternatives and so facilitate selection of a single alternative as the preferred build option.

Table 10-1 Key Performance Indicators

PERFORMANCE INDICATOR	DEFINITION
TRANSIT PERFORMANCE	
Vehicle travel time	Bus PM peak travel time, local and BRT*
Reliability	Difference between average and 95th percentile bus travel time*
Ridership	Daily boardings for all Geary lines*
SYSTEM PERFORMANCE	
Person-delay (auto and transit)	PM peak delay per person per intersection along the Geary corridor*
Diversions	Increase in PM peak hour traffic on nearby parallel streets
ENVIRONMENTAL EFFECTS	
Parking opportunities	Change in number of curb spaces (all types)
Trees and landscaping provided	Percent of existing trees retained Median area available for landscaping opportunities
PEDESTRIAN ACCESS AND SAFETY	
Ease of access to stops	Average maximum walk to closest local stop

PERFORMANCE INDICATOR	DEFINITION
	Average maximum walk to closest BRT stop
Pedestrian safety improvements	Opportunity for pedestrian curb bulbs in optimal locations Elimination of permissive-phase left turn signals or conversion to protected-phase signals
RAIL-READINESS	
Ease of conversion to rail	Extent of future construction to accommodate rail service
COST	
Construction cost	Total construction cost
Operations and maintenance costs	Annual operating cost Annual maintenance cost
CONSTRUCTION IMPACTS	
Access to businesses during construction	Length of construction duration

* Transportation performance measures are provided for the year 2020.

Source: SFCTA, 2015

10.3.3 | Elimination of Options by Location: Fillmore

The variation between the combinations under consideration primarily occurs in the portion of the corridor between 27th Avenue and Gough Street, where a large set of potential options was analyzed. As the most constrained locations in the corridor, the lane configurations selected for the underpass complexes at Fillmore Street and Masonic Avenue largely determine the alternatives that are possible for adjacent segments of the corridor. Therefore, many configurations were first considered and screened for these constrained locations. This subsection discusses the screening process for options at the Fillmore underpass; the following two subsections discuss the Masonic underpass and the segment between the two underpass areas, respectively.

For reasons of cost, engineering feasibility, and transfer accessibility to the 22 Fillmore line, the project team previously eliminated all options that would operate buses in the Fillmore underpass, rendering center-running BRT lanes infeasible for this section of the corridor without filling in the underpass. However, there has long been community interest in filling the underpass at Fillmore and restoring a surface street. Such a fill project would require a community process to obtain consensus on a final new street design, then additional time for engineering design and construction. A time estimate for these steps places construction completion well beyond 2020. This would result in delays to the Geary BRT project, which is currently scheduled for opening of BRT service by 2020. This represents a fatal flaw for the center-running BRT alternatives in the near term; however, Alternatives 3 and 3-Consolidated both include such a configuration through the Fillmore area.

Timing was a relevant factor in considering identification of the SRA. Given the timing issue, the only project design for the Fillmore area that would be compatible with a pre-fill scenario is an Alternative 2 configuration with side-running BRT lanes.

Benefits of center-running bus-only lanes at Fillmore. Although the center-running BRT alignment through the Fillmore area is not feasible in the near term due to timing constraints, it would have some benefits, including better transit performance and preservation of on-street parking. Transit travel times for center-running bus-only lanes with the fill would be up to 30 seconds shorter than side-running BRT using the service roads. The center-running configuration would require the removal of 49 parking spaces between Gough and Steiner Streets, while side-running would eliminate about 94 spaces.¹⁰

Summary of SRA considerations. In a pre-Fillmore fill scenario, side-running bus-only lanes are the recommended design for the segment between Palm Avenue and Laguna Street. This design does not preclude a future fill project and the work completed thus far by the Geary BRT project provides strong technical background to inform future discussions about the fill.

10.3.4 | Elimination of Options by Location: Masonic

Further study of the possible BRT configurations in the segment of the corridor with the Masonic tunnel identified significant passenger experience and traffic system performance issues with center-running BRT lanes in this area. Given these issues, configurations with center-running bus-only lanes in this segment of the corridor were eliminated from consideration. These performance issues are expanded upon below.

Passenger waiting experience. Center BRT lanes at Masonic would result in a poor passenger waiting experience in several ways, largely as a result of the location of the BRT platforms. While the station platforms would not be in the tunnel itself, they would be located below grade in the existing trench adjacent to the tunnel and not directly visible from street level. The project team has heard concerns from the public and the project Citizens Advisory Committee members about personal security and safety for passengers waiting on the platforms with minimal visibility. Poor visibility from the stations to the surroundings and their locations in the concrete trench would also result in a less aesthetically pleasing location for passengers to wait. The remaining through-lane of traffic would be located directly next to the westbound BRT platform, and could result in a noisy environment. Lastly, the tunnel and trenches channel wind through the area, which would add an element of physical discomfort to the station locations.

Wayfinding. Wayfinding would be more challenging with the center-running stop configuration, because the eastbound BRT station would be located just west of Masonic Avenue, while the westbound station would be just east of Presidio Avenue, a block away, and both would be below grade. The center-running configuration would also complicate transfers to and from the 43 Masonic.

Vertical circulation. The center station configurations would rely largely on vertical circulation to allow passengers to reach the platforms from Masonic and Presidio Avenues, although there would also be at-grade access to the opposite end of each platform. Due to the width of the platforms, only a single elevator and a relatively narrow set of stairs could be accommodated to serve passenger access needs at the end of each platform adjacent to the underpass. Ridership projections indicate that

this capacity would be sufficient to accommodate expected passenger flows in the opening and horizon years of the project, but if ridership at the station were higher than expected or continued to grow beyond 2035, modifications to increase capacity could be needed. Due to the limited width of the underpass, constructing additional access infrastructure would likely necessitate removing the remaining westbound mixed-flow travel lane through the underpass, resulting in additional traffic on the surface.

Circulation system performance. Reducing traffic capacity on Geary Boulevard is expected to cause some drivers to take alternate routes, and the project team has heard concerns from members of the public about possible traffic volume increases on parallel streets. Due to the loss of capacity resulting from the removal of all eastbound traffic and some westbound traffic from the underpass, center-running alternatives are expected to divert more traffic than side-running alternatives to parallel routes. This is particularly true with the higher overall traffic volumes projected in 2035. In that year, it is expected that Alternative 2 would divert fewer than 400 eastbound vehicles to major parallel streets during the PM peak hour, representing an 11 percent increase in traffic on those streets, while Alternative 3 would divert more than 900 eastbound vehicles, representing a 28 percent increase in parallel route volumes. Although model results are only available for the PM peak, the AM peak eastbound diversions for the center-running BRT alternatives would be expected to be even greater.

In terms of vehicle level of service (LOS) at the intersection of Masonic and Geary, which is based on the amount of delay experienced by vehicles moving through the intersection, Alternative 2 would create less vehicle delay, achieving an LOS of C in 2020, while Alternative 3 would produce an LOS of D. Average queue lengths for eastbound vehicles waiting for the light at Masonic would be about 19 vehicles for Alternative 3. Alternative 2, with side-running BRT, produces shorter queue lengths of approximately 10 vehicles.

Pedestrian and bicycle conditions. The surface-level service roads west of Masonic Avenue and east of Presidio Avenue are narrow, approximately 20 feet wide. Rerouting all eastbound and a portion of the westbound through traffic on Geary to the service roads with the center-running BRT alternatives would result in large traffic volumes operating in a narrow travelway directly adjacent to the sidewalk. Pedestrians would not be protected by a parking lane or other physical buffer from heavy vehicle traffic, resulting in poor sidewalk conditions. In addition, all project build alternatives would include a bicycle lane between Masonic Avenue and Presidio Avenue to connect east-west bicycle routes to the north and south of Geary Boulevard, and additional traffic at the surface level would worsen conditions for bicyclists using this connection. Installing a bus-only lane at the surface and retaining the existing through-travel lanes in the Masonic underpass would result in better pedestrian and bicycle conditions at the surface due to lower vehicle volumes in close proximity to sidewalks and bike lanes.

Benefits of center-running bus-only lanes at Masonic. Although the center-running BRT alignment through the Masonic tunnel (as incorporated into Alternatives 3 and 3-Consolidated) has significant performance issues, it would have some benefits, including better transit performance and preservation of on-street parking. Center-running bus-only lanes through the Masonic underpass would improve transit travel time over side-running bus-only lanes in this segment of the

corridor; the expected travel time for Alternative 3 would be approximately 80 seconds faster than for Alternative 2 between Broderick and Stanyan Streets. While all build alternatives would remove some parking spaces from Geary Boulevard in the Masonic segment of the corridor, center-running Alternative 3 would remove approximately 120 existing parking spaces between Broderick and Palm while Alternative 2 with side-running bus-only lanes would result in less parking loss with about 90 spaces removed. Although these benefits are considerable, in considering a SRA, they must be weighed against the other criteria, including the overall passenger experience.

Summary of SRA considerations. Center BRT lanes through the Masonic area are eliminated from consideration as the SRA due to low performance, particularly concerning the passenger experience and system performance. Thus, Alternative 2 is the only “pure” build alternative that remains under consideration for implementation corridorwide. Although the center-lane option is not recommended in the Masonic segment it was retained for the purposes of environmental analysis due to the transit performance benefits of bypassing the surface intersections with Masonic and Presidio Avenues.

10.3.5 | Elimination of Options by Location: Between Fillmore Street and Masonic Avenue

As the most constrained locations in the corridor, the design options selected for the underpass complexes at Fillmore Street and Masonic Avenue limit the options that are possible for the intervening segment of the corridor. The BRT lanes would need to be on the side at Scott/Pierce Streets to move through the Fillmore complex, and on the side again at Broderick Street in order to move through the Masonic complex. The distance between these intersections is 0.3 miles, too short to justify transitioning the bus from side to center and back again. Therefore, center-running BRT lanes were eliminated from consideration for the short portion of the corridor between Masonic Avenue and Fillmore Street.

10.3.6 | Comparison of Remaining Combinations

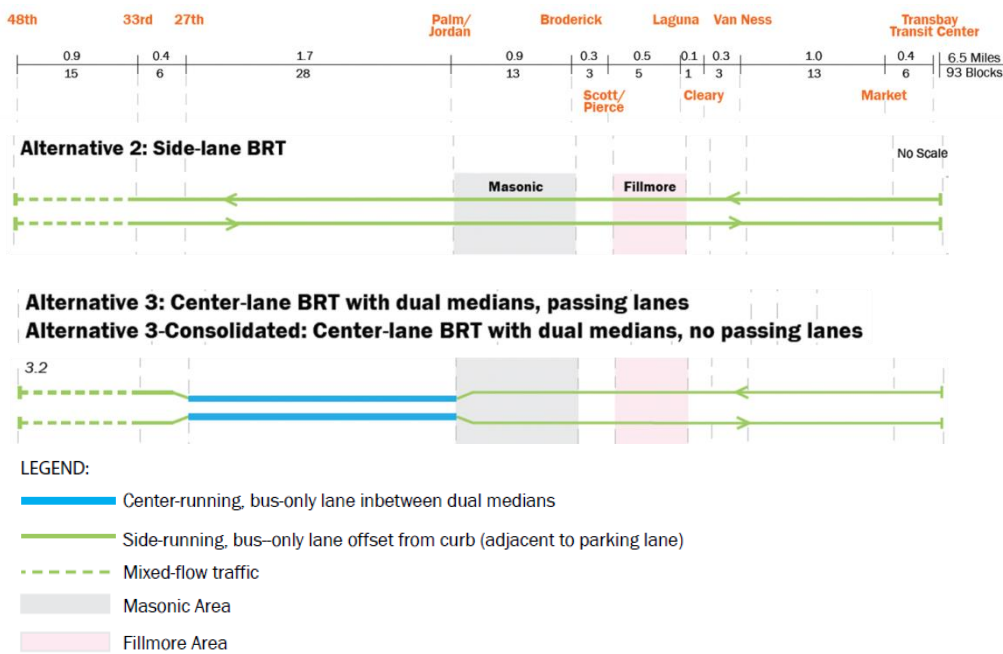
After screening fatally flawed and low-performing alternatives/configurations from consideration for the SRA, the following alternatives and combinations remained for evaluation (shown in Figure 10-5):

- Alternative 1: No Build Alternative
- Alternative 2: Side-lane BRT between Market Street and 34th Avenue with dual service (separate local and BRT services)
- Alternative 3.2:
 - Side-lane BRT between Market Street and Palm Avenue with dual service
 - Center-lane BRT with right-side platforms between Palm and 27th Avenues with dual service
 - Side-lane BRT between 27th and 34th Avenues with dual service
- Alternative 3.2C (Hybrid Alternative, the eventual LPA):

- Side-lane BRT between Market Street and Palm Avenue with dual service
- Center-lane BRT with right-side platforms between Palm and 27th Avenues with consolidated service
- Side-lane BRT between 27th and 34th Avenues with consolidated service

Consolidated service was considered only with Alternative 3.2 primarily because it was intended to reduce the significant parking losses caused by passing lanes in a center-running BRT configuration with dual service. In addition, the transit travel time benefits of center-running bus-only lanes would be more than able to compensate for the additional dwell time for BRT buses with consolidated stops.

Figure 10-5 Remaining Alternatives and Combinations Under Consideration



Source: SFCTA, 2014

To help identify a SRA, this section considers the performance of Alternatives 2, 3.2, and 3.2C compared to the No Build on each key performance indicator for the entire corridor from 48th Avenue to the Transbay Transit Center. Table 10-2 summarizes the results of this evaluation. Alternative 3.2 was not modeled as part of the analysis, but for many metrics, results could be estimated by combining results from the side- and center-running segments of other alternatives. However, doing so is not possible for some metrics, such as transit ridership, so a range is provided. Also, for some indicators, data is only available for the portion of the corridor where the BRT physical improvements would be implemented.

Table 10-2 Alternatives and Combinations Performance Summary

PERFORMANCE INDICATOR	NO BUILD	ALT. 2 (SIDE-LANE BRT)	ALT 3.2 (CENTER/SIDE, NOT CONSOLIDATED)	ALT 3.2C (HYBRID; CENTER/ SIDE, PARTIALLY CONSOLIDATED)
TRANSIT PERFORMANCE				
Vehicle travel time [min]				
Rapid/BRT service	53:50	45:00	42:45	44:45
Local service	1:02:30	54:00	51:55	51:55
Reliability, BRT [travel time diff. bet. average and 95th % trip, min]				
Rapid/BRT service	4:45	3:15	2:55-3:15	3:35
Local service	5:40	4:05	4:05-4:20	4:10
Ridership [total daily boardings]	64,000	75,700	75,700-77,600	77,600
CIRCULATION SYSTEM PERFORMANCE				
Person-delay [auto+transit, total delay hours during peak hour]	4,890	4,130 (-16%)	4,130-4,310 (-12-16%)	4,310 (-12%)
Diversions [increase in peak hour traffic on nearby parallel streets at Masonic]	0	4%	7%	7%
ENVIRONMENTAL EFFECTS				
Parking opportunities [existing corridor on-street parking removed]	0	460	500	410
Existing trees removed	0	156	195	182
Median landscaping area [acres]	3.1	3.1	3.6	3.5
PEDESTRIAN ACCESS AND SAFETY				
Average stop spacing [feet]				
Rapid/BRT stops	1540	2180	2160	1740
Local stops	720	840	920	1090
Pedestrian safety improvements	-	+	+	++
RAIL-READINESS				
Ease of future conversion to rail	•	•	+	++
COST				
Construction cost [2013\$]	\$0	\$170M	\$300M	\$300M
Operations and maintenance costs [2013\$/year and \$/weekday passenger]	\$36.7m	\$49.5m	\$49.2-49.5m	\$49.2m
CONSTRUCTION IMPACTS				
Total duration of construction [weeks]	0	90	100	100 weeks per Phase* (Market-Stanyan Phase I; Stanyan - 34th Phase II)

All performance results are for the year 2020.

Symbol key:

+ or ++ indicates performance advantage or strong advantage relative to No Build condition.

- or -- indicates performance disadvantage or strong disadvantage relative to No Build condition.

• indicates minimal or no performance change relative to No Build condition.

Source: SFCA, 2014

Transit performance

Transit travel time. Throughout the corridor, all of the build alternatives would provide 16 percent to 21 percent reductions in travel times compared to the No Build scenario. Alternative 2 BRT travel time would be approximately 45 minutes for this section. Alternative 3.2 would be faster than Alternative 2 by more than two minutes; Alternative 3.2C would be slightly faster than Alternative 2. Travel times would vary between 34th Avenue and Stanyan, but would otherwise be the same across all of the build scenarios.

Transit reliability. Transit reliability is measured using the difference between the average bus travel time in each alternative and the 95th percentile travel time, which for a weekday round-trip commuter would approximately correspond to the worst travel time experienced on any one commute journey over a two-week period. For a trip along the entire corridor, 19 out of every 20 trips are expected to take no longer than the average transit travel time plus the additional 95th percentile travel time reported in Table 10-2. A high number indicates greater travel time variability, while a lower number indicates more consistent travel times. The tools used to estimate transit performance show that the build scenarios would reduce 95th percentile additional travel time for rapid/BRT service by about 1.5 minutes relative to the No Build alternative. Differences between build alternatives would be relatively small.

Not all of the causes of travel time variability can be analyzed with available traffic simulation models. Some sources of travel time variability, particularly the cascading effects that occur when a bus starts to run late, are not captured by these tools. The estimated values likely understate travel time variability for scenarios and segments that do not feature dedicated center-running bus lanes.

Ridership. All of the build alternatives are expected to increase Geary transit ridership compared to the No Build alternative. In 2020 Alternative 2 is projected to increase ridership in the corridor by approximately 18 percent relative to the No Build Alternative. Alternative 3.2 and 3.2C are expected to have higher ridership than Alternative 2.

System performance

Person-delay. Person-delay, or the total hours that all auto and transit users spend in delay during the peak period, provides a measure of overall transportation system efficiency and performance in the corridor. The measure includes all intersections along the corridor between Van Ness Avenue and 25th Avenue. All of the build alternatives would reduce person-delay relative to the No Build Alternative. Alternative 2 would reduce delay by 16 percent, while the Alternative 3.2C would reduce delay by 12 percent. Alternative 3.2 would likely perform within the range of the other two build alternatives.

Diversions. With fewer mixed-flow travel lanes on Geary Boulevard with the proposed BRT project, some drivers are expected to use other parallel routes to reach their destinations. These diversions are projected to be greatest in the section of the corridor near Masonic Avenue. In this area, traffic on nearby parallel streets (between Fulton Street and the Presidio) with Alternative 2 would increase by an estimated average of 4 percent in the PM peak hour in 2020 relative to projected volumes in the No Build scenario. Diversion rates with Alternative 3.2 and Alternative 3.2C are expected to be somewhat higher.

Community effects

Parking preservation. All three build alternatives would result in elimination of on-street parking spaces in at least some portions of the corridor. Corridorwide, Alternatives 2 and 3.2 would have similar parking impacts, resulting in removal of approximately 27 percent and 29 percent of spaces, respectively. Alternative 3.2C would remove less parking, a total of 22 percent of spaces. These differences are due to the different configurations west of Palm Avenue; parking impacts east of Palm would be identical.

Existing trees retained. All of the alternatives under consideration would retain most of the existing trees corridorwide, but some would need to be removed to accommodate street reconfigurations. Alternative 2 would result in the fewest tree removals, 156, because most of the corridor improvements would be made along the sides of the street and not require reconstruction of the median. Alternatives 3.2 and 3.2C would remove approximately 40 more trees than Alternative 2. All trees removed as part of the project would be replaced with new healthy, drought-resistant trees.

Median landscaping area. The area available for median landscaping would differ between alternatives only where center BRT lanes are under consideration and for the length of the associated transitions at either end of the center-lane portion. As a result, most of the difference in median area available would occur in the Palm Avenue to 27th Avenue portion of the corridor. Corridorwide, Alternative 3.2 would provide the most median area, followed by Alternative 3.2C. Alternative 2 would provide approximately the same amount of median area as the No Build alternative.

Pedestrian access and safety

Average stop spacing. All of the build alternatives include fewer bus stops than current exist and would continue to exist with the No Build Alternative. West of 33rd Avenue and east of Masonic Avenue, most stop locations would be the same across the build alternatives. Alternative 3.2C would consolidate local and BRT stops between Arguello Boulevard and 34th Avenue. As a result, corridorwide it would significantly increase the average spacing between local stops but result in minimal change in average spacing between BRT service stops. Alternatives 2 and 3.2 would result in higher average spacing between BRT stops, but less change in the average distance to local stops.

Pedestrian safety improvements. All of the build alternatives would include pedestrian safety improvements along the Geary corridor, including installation of new corner bulbs to reduce crossing distances, new pedestrian crossing signals, and traffic signal upgrades. These elements would improve pedestrian safety corridorwide relative to the No Build Alternative. Alternatives 3.2 and 3.2C would provide additional benefits in the Palm to 27th Avenue section of the corridor due to proposed signal upgrades. The Alternative 2 and Alternative 3.2 street configurations would not allow bulbs to be placed at many corners with local bus stops. Alternative 3.2C would allow bulbs to be placed at more corners with transit stops, better meeting the project's transit access and pedestrian safety objectives. Under Alternative 3-Consolidated, pedestrian bulbs could be placed in more optimal locations for transit access and safety objectives than with the other build alternatives.

Rail-readiness

Alternative 3.2C would best facilitate future conversion to rail service in the Palm to 27th Avenue portion of the corridor due to its center-running alignment and consolidated stops. Alternative 3.2 would partially facilitate conversion in the center-running portion. Outside that segment, the build alternatives would not differ; all would require substantial construction to construct rail, but none would preclude the possibility of doing so.

Costs

Capital costs. In terms of capital construction costs, Alternative 2 would be less expensive than Alternatives 3.2 and 3.2C because it would utilize much of the existing pavement and reuse most of the existing median. The center lane alternatives would include a new median busway with new pavement, new medians with landscaping and bus platforms, and new street lighting. These additional improvements would be primarily between Palm and 27th Avenues. The construction cost maximum for projects receiving FTA Small Starts funding, which this project is seeking, is \$300 million. Alternative 2 costs would be well below the cap; but costs for Alternatives 3.2 and 3.2C would approach the maximum.

Operating costs. The annual cost to operate bus service on the Geary corridor is expected to increase over time in due to increasing traffic congestion and the need to accommodate higher ridership. By 2020, the service is estimated to cost \$36.7 million annually to operate with the No Build scenario. Further increases in service frequency would be required with the build alternatives in order to serve the additional riders that would be attracted to the corridor with improvements to bus travel time and reliability. With Alternative 2, the annual operating cost is expected to increase to \$49.5 million, while Alternative 3.2C would cost \$49.2 million to operate and costs for Alternative 3.2 would be between \$49.2 million and \$49.5 million.

Construction Impacts

Total construction duration. The recommended construction approach would involve construction on multiple work zones of several blocks each in order to minimize the length of disruption on any one block. Thus, construction in any individual work zone would generally be shorter than the length of time required to construct the entire project. Construction durations for the overall project would vary from 21 months for Alternative 2 to 23 months for either Alternative 3.2 or 3.2C.

10.3.7 | Summary Conclusion: Alternative 3.2C (Hybrid Alternative) as Staff Recommendation

San Francisco County Transportation Authority (SFCTA) staff engaged in a collaborative process with SFMTA staff to consider the performance of the alternatives and configurations under consideration against the evaluation criteria in Section 10.3.2 above and identify the alternative that meets the project purpose and need. This process included an extensive public outreach process, with three public open houses and meetings with more than 25 community stakeholder groups, to collect input on the alternatives (with further meetings regarding the underlying design options and configurations that comprise the full corridor alternatives). Based on the analysis of performance and public input received, SFCTA and SFMTA staffs

identified Alternative 3.2C, the Hybrid Alternative, as the SRA – in other words, the alternative recommended for the adoption as LPA. See Chapter 2 for detailed descriptions of the alternatives evaluated in the Draft EIS/EIR and this Final EIS and Section 2.3.8 regarding further comparison of alternatives and the selection of the Hybrid Alternative/LPA as the environmentally preferable alternative and the preferred alternative.

As set forth in Chapter 1 of this Final EIS, the purpose established for the project under NEPA was to:

- Improve transit performance on the corridor as a key link in the City’s rapid transit network to improve the passenger experience and promote high transit use.
- Improve pedestrian conditions and pedestrian access to transit.
- Enhance transit access and the overall passenger experience, while maintaining general vehicular access circulation.

The need for the project was defined as encompassing the following facts:

- Existing transit service in the Geary corridor is unreliable, slow, and crowded, and is in need of improvement in order to promote high ridership and competitiveness with other travel modes.
- Geary Boulevard’s wide travelway and high vehicle travel speeds create unfavorable pedestrian conditions - especially west of Gough Street and throughout the Richmond District.
- The Geary corridor’s existing street and streetscape environment do not provide a high-quality transit passenger experience, despite the corridor’s high transit ridership.

As discussed in this chapter, many alternatives were considered and rejected prior to the Draft EIS/EIR due to failure to meet the project purpose and need or other fatal flaws. As demonstrated in earlier sections of this chapter, the Hybrid Alternative is feasible to construct and operate within the time and funding limitations of the project, as well as within the physical and operating constraints of the Geary corridor. As noted previously, Alternatives 3 and 3-Consolidated would require intensive, expensive, and lengthy construction particularly within the Fillmore and Masonic areas. Due to these and other issues with center-running bus lanes at these locations, agency staff rejected Alternatives 3 and 3-Consolidated from further consideration as the SRA.

Of the alternatives and combinations that remained under consideration, the Hybrid Alternative and Alternative 3.2 would provide the most significant improvements to transit. While all of the build alternatives would improve transit speed, reliability, and the passenger experience compared to the No Build Alternative, the two alternatives that include center-running bus-only lanes in the Richmond would most improve bus performance in the corridor and would attract more riders than either Alternative 2 or the No Build Alternative.

A significant advantage of the Hybrid Alternative is its benefits to pedestrian safety, a key element of the project purpose. All of the build alternatives would outperform the No Build Alternative, but the Hybrid Alternative would offer more

opportunities for pedestrian safety features, such as protected left turn signals and curb bulbs at key crosswalks, than Alternatives 2 and 3.2.

In addition to providing the best overall transportation system performance, the Hybrid Alternative would have similar or reduced impacts compared to the other build alternatives in key areas that are of concern to communities along the corridor. In particular, it would have a much more limited effect on the corridor parking supply than would the other build alternatives that remained under consideration. Differences between the build alternatives are generally smaller for other areas of concern: the Hybrid Alternative (and Alternative 3.2) would result in more tree removal but also more landscaping opportunities than Alternative 2. Construction duration for the two alternatives with a center-running segment would also be somewhat longer. However, compared with these other impacts, input from communities along the corridor has consistently indicated the most concern with parking loss. The No Build Alternative would involve minimal changes to parking, entail no tree removal, and result in more limited construction disruption but would have fewer landscaping opportunities compared to the build alternatives.

Among build alternatives, between the Hybrid Alternative and Alternatives 2, 3 and 3-Consolidated, the Hybrid Alternative would meet the purpose and need of the project by improving transportation conditions in the corridor and its similar or lesser impacts in key areas of community concern compared to other alternatives. SFCTA and SFMTA staffs therefore recommended selection of the Hybrid Alternative as the LPA for BRT in the Geary corridor.

10.4 Selection of Locally Preferred Alternative

The Draft EIS/EIR was published on October 2, 2015, and was made publicly available for a 59-day review period, wherein all interested parties were encouraged to review and provide comments on its contents. A public comment meeting was held on November 5, 2015, at St. Francis Hall, St. Mary's Cathedral (1111 Gough Street, San Francisco, CA) from 6:30pm to 8:30pm; see Section 8.3.2.2 for further details. A total of 299 comment communications (e.g., letters, emails, oral comment transcripts) were submitted. These included six communications from agencies, 13 communications from organizations, and 280 separate communications from 244 individuals. All comments received during the public comment period, as well as those received before December 10, 2015, are included in Appendix L of this Final EIS along with written responses to each of these comments.

SFCTA released the Final EIR for the Geary BRT project on December 9, 2016. As the California Environmental Quality Act (CEQA) lead agency, SFCTA certified the Final EIR, approved the project, and identified the Hybrid Alternative with five minor modifications as the LPA on January 5, 2017. All of these actions were on unanimous votes of the SFCTA Board. SFCTA issued a Notice of Determination (NOD) on January 6, 2017. The sixth minor modification was subsequently added and analyzed in a CEQA addendum; the SFCTA Board took an approval action on June 27, 2017, as further discussed in Section 2.2.7.6.6.

On July 18, 2017, the SFMTA Board unanimously approved the project and concurred with the LPA, including all six minor modifications noted above. SFMTA issued a NOD on July 25, 2017.

As demonstrated throughout this Final EIS, none of these modifications would result in new or more severe impacts to any resource area and thus had no bearing on the selection of the Hybrid Alternative as the LPA – the modifications simply address local concerns while still meeting the purpose and need established for the project.¹¹ The six minor modifications to the Hybrid Alternative/LPA are:

- 1) Retention of the Webster Street pedestrian bridge;
- 2) Removal of proposed BRT stops between Spruce and Cook streets (existing stops would remain and provide local and express services);
- 3) Addition of more pedestrian crossing and safety improvements;
- 4) Addition of BRT stops at Laguna Street;
- 5) Retention of existing local and express stops at Collins Street; and
- 6) Relocation of the westbound center- to side-running bus lane transition to the block between 27th and 28th avenues.¹²

These modifications to the Hybrid Alternative/LPA are consistent with the project purpose and need to enhance the performance, viability, and comfort level of transit and pedestrian travel along the Geary corridor. Modifications to retain the Webster Street bridge and provide additional pedestrian crossing and safety improvements further the purpose of improving pedestrian conditions in the corridor. Modifications to bus stop configurations, i.e., at Spruce/Cook, Laguna, and Collins Streets, further the purpose of enhancing access to transit – either BRT or local/Express services. Moreover, all modifications were developed in response to input from the public to enhance the overall experience for passengers and pedestrians along the corridor. See Section 2.1.1 for further discussion of selection of the LPA.

¹¹ As noted in Section 2.3.8, the modifications were also not relevant to the selection of the environmentally preferable alternative and the preferred alternative.

¹² This change to the Hybrid Alternative was not included in the LPA that was approved in January 2017 but rather was added and approved in June 2017. SFCTA prepared an addendum to the Final EIR associated with this change.