38 Geary Temporary Emergency Transit Lanes Project

Evaluation Report

SFMTA.com/TempLanes38

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SFMTA

Contents

Introduction

The 38 Geary Temporary Emergency Transit Lanes Project (Geary TETL Project) is part of the SFMTA's efforts to respond to the COVID-19 pandemic. The project includes temporary emergency transit lanes, temporary bus bulbs, and Muni head start signals at select locations along Geary Boulevard in the Richmond District as shown in Figure 1 below. Altogether, these treatments are intended to protect transit from the return of traffic congestion to provide fast, reliable trips for those making essential trips on Muni and to limit the potential for crowding and pass-ups. Transit lane installation and Muni Head Start signals were completed in December 2020, and wooden bus bulb installation was completed at the beginning of February 2021. More information about the project is available at SFMTA.com/TempLanes38.

Figure 1: Geary TETL Project Transit Priority Treatments

The Geary TETL Project was approved as a temporary project, subject to removal within 120 days of the lifting of San Francisco's State of Emergency Order, pending evaluation and additional public process to consider whether to make the changes permanent. This document presents the results of the Geary TETL project evaluation, which finds that despite recent increases in traffic citywide, evaluation results are showing that the new transit lanes are helping keep 38 Geary buses moving, with minimal traffic impacts to Geary Boulevard or parallel streets. Additionally, a majority of those who took our evaluation survey support maintaining the Geary TETL improvements permanently.

Evaluation approach and objectives

The TETL program's objectives are centered around improving transit performance in support the following three citywide goals:

1. **Equity:** The TETL program aims to provide efficient and reliable transit service for people with the fewest travel choices, while reducing the risk of COVID-19 exposure by providing adequate capacity for physical distancing and less time spent onboard transit vehicles.
2. **Health:** The TETL program aims to reduce the risk of COVID-19 exposure for all transit riders.
3. **Economic Recovery:** The TETL program aims to support increasing economic activity by providing an efficient, reliable, safe transit system.

Table 1 below summarizes each objective considered in the Geary TETL Project evaluation. This framework was developed to consider potential project benefits and impacts. It was informed both by input from the Geary Community Advisory Committee and stakeholder responses to a survey on what metrics should be included that was administered in fall 2020.

Table 1: Evaluation objectives for the Geary TETL project

Objective
1. Consider stakeholder feedback
2. Improve experience for Muni operators
3. Provide a safe travel option for those with the fewest travel choices, particularly Black, Indigenous, People of Color, lower income, and unsheltered individuals
4. Preserve Muni travel time savings
5. Improve Muni headway (time between buses) reliability
6. Reduce the number of crowded buses
7. Monitor collisions along Geary TETL area and parallel streets
8. Monitor impacts to vehicle traffic
9. Ensure loading needs are met where parking changes are implemented
10. Improve accessibility and reduce crowding at busy stops

In addition to this project-level evaluation of the Geary TETL Project, some additional metrics will be considered programmatically across all TETL projects. When available, this information will be published online at SFMTA.com/TempLanes.

The Geary TETL evaluation generally includes four time periods in its analysis (each six weeks long) as shown in Table 2. For some metrics analyzed, different dates were necessary to analyze and are noted as such in relevant sections.

Table 2: Analysis periods used in this evaluation

Analysis Period	**Dates**	**Notes**
Pre-COVID	January 15 – February 28, 2020	
COVID Spring	April 15 – May 30, 2020	COVID period with lowest traffic levels
COVID Fall	September 15 – October 30, 2020	COVID period with highest traffic levels prior to Geary TETL installation
TETL Spring	March 1 – April 20, 2021	After installation of transit lanes, queue jumps, and bus bulbs, with additional time for travel behavior to adjust to changes

Stakeholder feedback

Methods

A public survey was distributed to ask Geary corridor travelers about their perceptions of changes in travel along Geary Boulevard after implementation of the Geary TETL Project. The survey questions are available in Appendix A.

The survey was available in online, text and paper formats during February and March 2021. The survey was promoted via posters at bus stops, advertisements on Facebook, Instagram and Spotify, the SFMTA website, emails to the Geary TETL and Geary Rapid Project lists (~3,000 subscribers), and was distributed at local food pantries to low-income and senior populations. Surveys in all formats were available in English, Russian, and Chinese.

A total of 718 responses were received. 88% (635) were online (267 desktop, 356 mobile, and 12 tablet), 0.3% (2) were by text, and 11% (81) were paper surveys. 93% (665) were completed in English, 0.8% (6) in Russian, and 7% (47) in Chinese.

Key Findings

The vast majority of respondents (80%) said it is somewhat, very, or extremely important to make sure Muni does not get delayed in traffic (Figure 2).

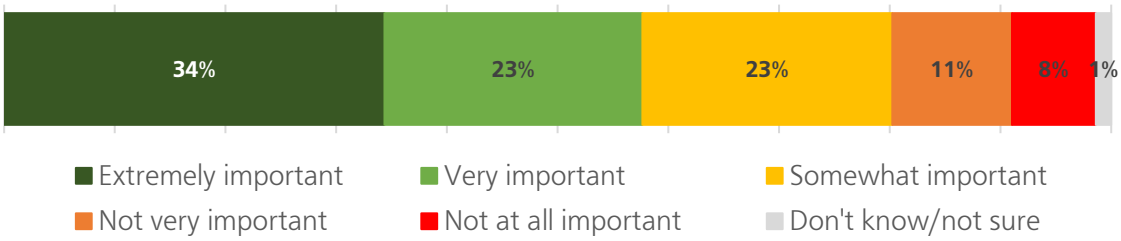

Figure 2: Responses to "How important is it to you that Muni doesn't get delayed in traffic?"

A majority of respondents (52%) supported making the Geary TETL Project permanent (Figure 3).

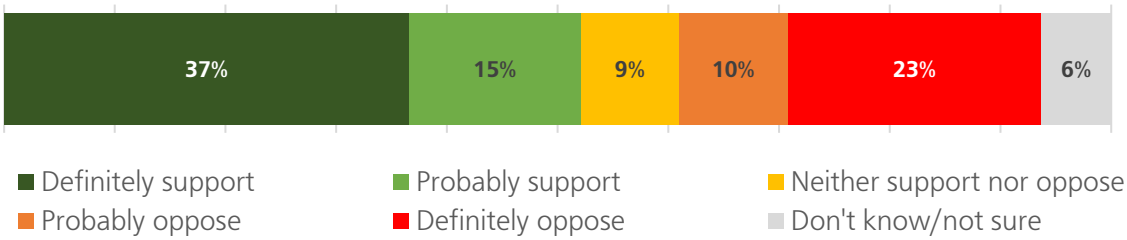

Figure 3: Responses to "Emergency transit lanes are a temporary measure to benefit those who rely on Muni. Would you support making them permanent?"

Most respondents either thought trip quality, travel time, and reliability was better or about the same (Figure 4).

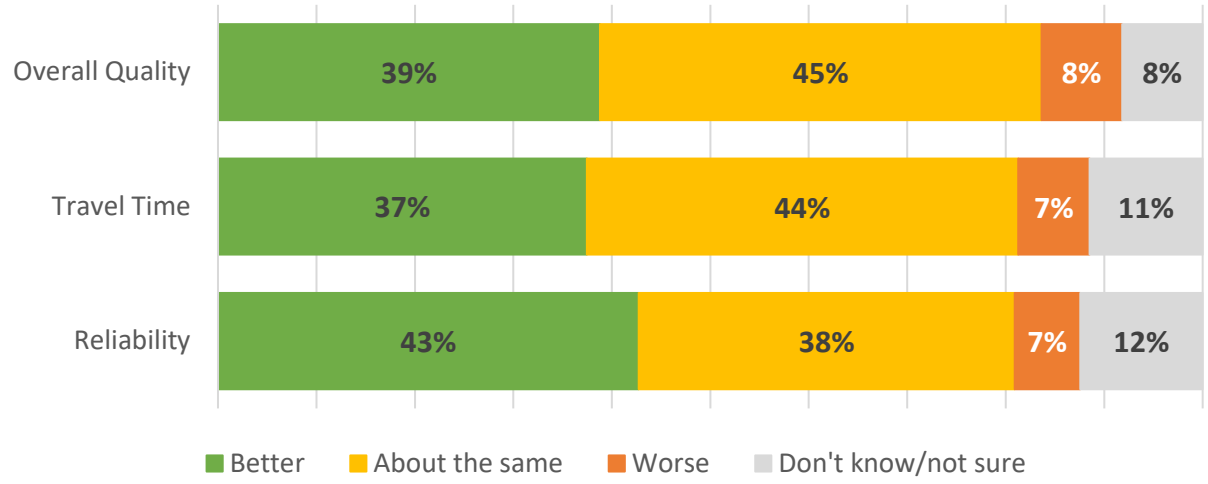

Figure 4: Responses to questions asking whether overall trip quality, travel time, and reliability had changed since the Geary TETL project was implemented

Some key themes from free response comments were:

- **Improvements in transit performance and safety:** comments noting that wooden bus bulbs improved the boarding experience, that trips felt faster and more reliable, and that the street felt calmer and safer.
- **Increases in difficulty of driving:** comments regarding changes in the experience of driving private vehicles along Geary Boulevard, noting that congestion increased, that the changes to the roadway were confusing, that making right turns was difficult because of stopped buses, and that it was more difficult to use the right lane when looking for parking.
- **Several comments preferring Geary TETL side-running transit lanes over a Geary Bus Rapid Transit vision with center-running transit lanes,** noting preferences for boarding from the side of the street, lower cost, and less construction disruption/business impacts.
- **Need for enforcement and requests to color transit lanes red:** Several comments noted issues with driver compliance with the transit lanes, with suggestions including additional enforcement and coloring lanes red to improve legibility/visibility.

Additional key findings are embedded in later sections of this report that integrate stakeholder perceptions with relevant quantitative data.

Additional findings

In addition to the key findings above, the following summarizes the results for all other survey questions.

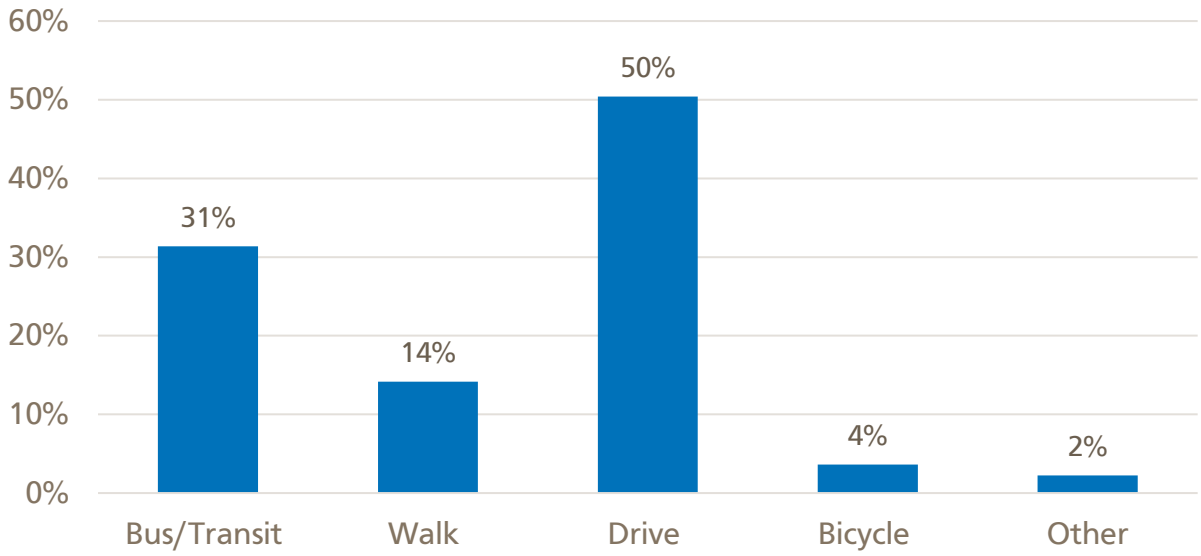

Figure 5: Responses to "Thinking about your trips since early January, how do you most often travel on Geary Boulevard in the Richmond?" (Some respondents chose multiple modes.)

48% of respondents had ridden the 38 or 38R in 2021. For those who had, the frequency of their rides is shown in Figure 6.

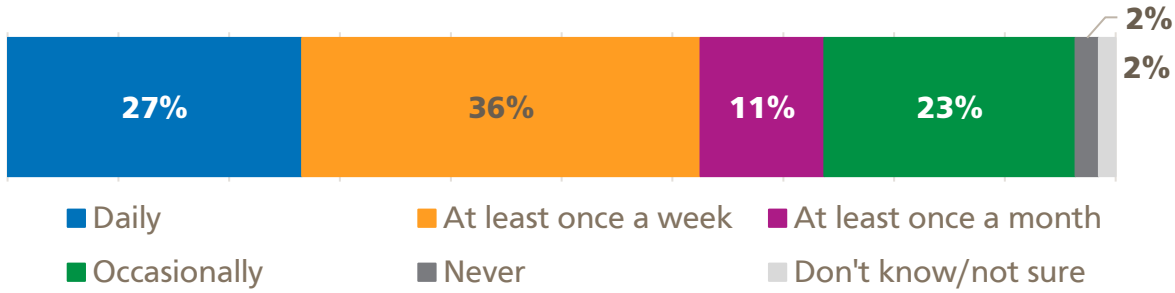

Figure 6: Responses to "How often do you currently take the 38 Geary or 38R Geary Rapid?"

75% of respondents reported that someone in their household owned a car for trips in San Francisco, while 23% reported that no one in their household owned a car. For those who primarily drove in the Geary corridor, responses about driving and parking difficulty in the Geary TETL area are shown in Figure 7 and Figure 8.

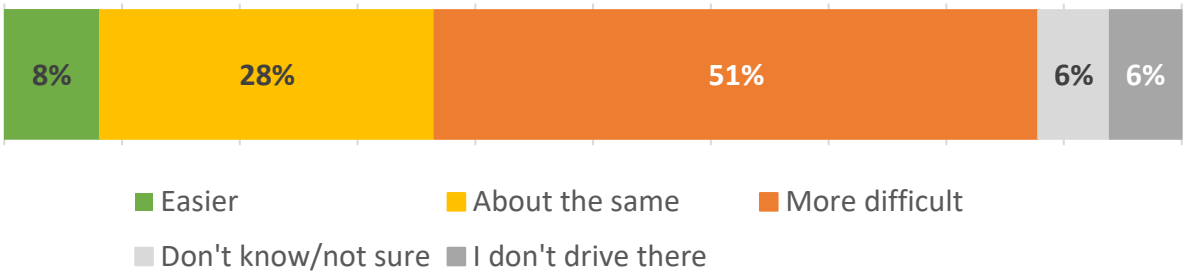

Figure 7: Responses to "Emergency transit lanes and parking changes were installed on Geary Boulevard in early January. Since then, how would you describe driving on or near Geary between Stanyan Street and 33rd Avenue?"

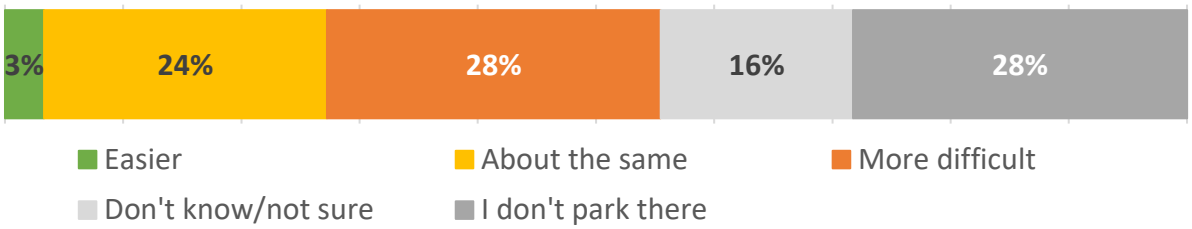

Figure 8: Responses to "How would you describe parking on or near Geary Boulevard between 14th and 16th avenues since early January?"

As shown in Figure 9, in terms of safety, most people felt walking along or across Geary Boulevard felt about the same since the project was implemented.

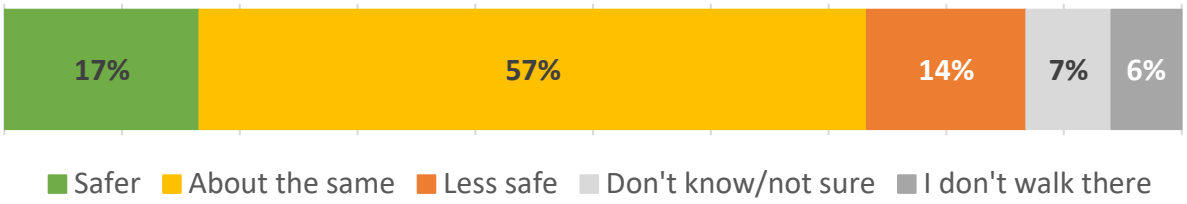

Figure 9: Responses to "Thinking about traffic safety, since emergency transit lanes were installed in early January how safe do you feel walking along or across Geary Boulevard in the Richmond?"

Demographics

Demographic questions were used to gauge how well survey respondents matched all members of the Richmond District community. The reported race/ethnicity of respondents largely matched that of the Richmond District as a whole, though those identifying as Black/African American and Native American were underrepresented among survey respondents.

There was a significant gender imbalance among respondents: 36% (218) were female, 53% (317) were male, 1% (10) had another gender identity, and 10% (58) were unsure or chose not to disclose. However, only one question had any significant variance by gender: men were more

likely than women to bike, so the reported proportion of residents that primarily bike may be slightly overstated.

Those with annual household incomes between $10,000 and $50,000 were underrepresented in the survey respondents, while those with incomes over $150,000 were overrepresented. Those under age 35 were underrepresented in the survey respondents, while those over age 65 were overrepresented.

The following are some example comments that reflect common themes of free response comments:

Improvements in transit performance and safety

> *"As a Veteran, I depend on reliable 38 service to the VA Hospital. It seems to be better."*
>
> *"This is such a great improvement. It's an incentive to take the bus, it definitely improves the bus ridership experience, and it makes service more reliable"*
>
> *"I have always heard of compliments about shorter and more efficient commutes for work and other personal businesses from my mother, who takes 38/38R every single day of the week."*
>
> *"Helps reduce speeds and enhances pedestrian safety so I support."*
>
> *"Lanes make it safer for peds and bikes and calm traffic too 👏"*

Increases in difficulty of driving

> *"SFMTA continues to make driving in SF more difficult, frustrating, inconvenient."*
>
> *"The bus lane only causes more traffic during traffic hours and it is very difficult for driving to get into the right lane for parking and making a right turn."*
>
> *"They cause more congestion. Cause more erratic driving. Cause people to change lanes more to get around traffic or get in and out of those bus lanes."*
>
> *"... this bus lane makes bottleneck which is very unfortunate on weekends when there are fewer buses and more weekend cars to do errands... Muni is destroying the livelihood of businesses without customers who can't find parking or stuck in semi weekend traffic. It turns people away to shop."*
>
> *"It makes it harder for cars to make turns. They do not have time to switch lanes because they can't drive in the lane. Too many cars, not enough lanes to travel on."*

Several comments preferring Geary TETL side-running transit lanes over Geary Bus Rapid Transit vision for center-running transit lanes

"Use these lanes and do not tear up Geary."

"Seems like this could provide good long-term improvement to the 38. I was never in favor of the BRT idea. This doesn't seem to have the BRT downsides of making crossing Geary to catch a bus much scarier (I'm disabled) and also doesn't seem to have the negative impacts on local businesses that BRT would have..."

"Please keep these lanes, the new light timings, and the boarding platforms. They're just as good as the proposed Geary BRT Phase 2, and so much less expensive. No Geary BRT Phase 2."

"Keep these transit lanes permanent. It would replace the need for a $300M Geary BRT that will destroy Geary Blvd., especially the small businesses. We do not want what happened on Van Ness to happen on Geary. Transit lanes will decrease transit time as effectively as a Geary BRT, and for a tiny fraction of the price. No BRT."

"The emergency transit lanes are good enough for Geary... no need to create BRT for millions of dollars and having the street torn up for years creating it."

Need for enforcement and requests to color transit lanes red

"Paint them red for higher visibility. Enforce inappropriate use."

"Buses sometimes get stopped due to double parked vehicles, even when there are places to park at the curbs. Would be good to paint them red where they are not red..."

"Too many cars use them to double park for errands. Needs enforcement."

"One of the reasons I think everything is still the same is that there doesn't seem to be any enforcement. Cars just continue to use the bus lanes as if they were normal lanes."

Operator feedback

Methods

Muni's highly trained operators can offer valuable firsthand knowledge of how street changes affect their day-to-day operating experiences. In addition, Muni operators are frontline essential workers who have an extremely difficult and important job, particularly during the COVID-19 pandemic. Improving bus operators' work experience was explicitly part of the TETL programs' goals. Paper surveys were distributed in late January and early February to operators at the Flynn and Islais Creek divisions, the two bus divisions that operate 38 and 38R service.

Key findings

Of the 87% of operators who were aware of recent Geary TETL changes, most (83%) reported that these changes had made their jobs easier (Figure 10).

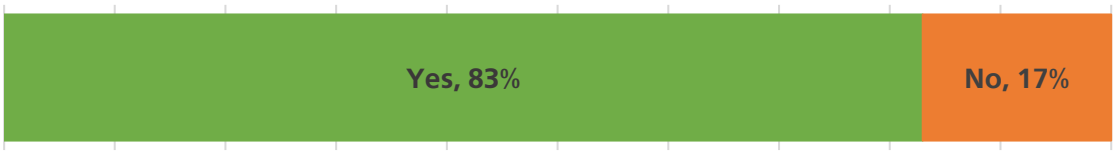

Figure 10: Responses to "Have the transit improvements made your job easier?"

About 2/3 of operators indicated that recent changes had made their trips faster, however; many indicated a need to slow down to maintain headways (Figure 11). This means that with changes to schedules, potential additional travel time savings may be available. While a substantial proportion of private vehicle drivers reported longer travel times after the Geary TETL project in the stakeholder survey described above, no operators did, indicating that the transit lanes are protecting buses from rising traffic.

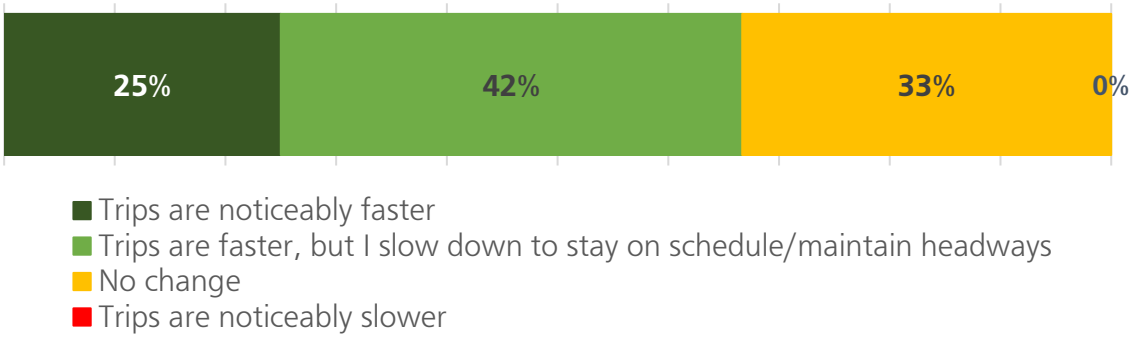

Figure 11: Responses to "Have these improvements changed travel times?"

Over 2/3 of operators (72%) reported fewer conflicts with other vehicles (Figure 12) indicating that the emergency transit lanes are helping to protect buses from private vehicle traffic. Operators reported that most vehicles stayed out of the transit lanes. However,

there were several requests for enforcement regarding double-parking, improper use of the transit lane as a travel lane, vehicles moving during the Muni Head Start signal interval, and vehicles making right turns from the left side of buses.

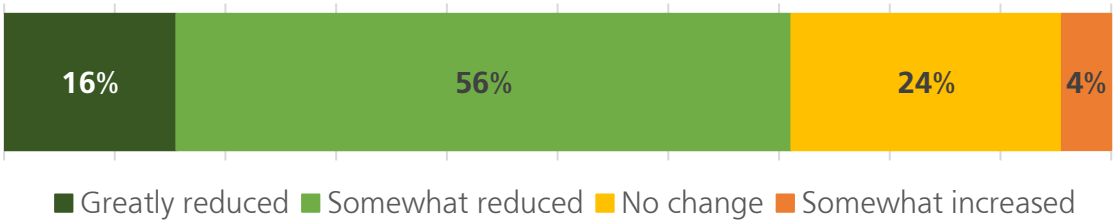

Figure 12: Responses to "Have conflicts with other vehicles changed?"

Of the operators surveyed in January/February who operate the 38 or 38R, 87% reported that they were aware of changes made as part of the Geary TETL project. 74% were aware of the transit-only lanes, 35% were aware of the wooden bus bulbs, and 57% were aware of the signal queue jumps. Some of these operators likely only operate these routes occasionally. Operators also requested improvements including red painted lanes, longer bus bulbs, longer Muni Head Start signal intervals, and far side bus stops to avoid conflicts with right-turning vehicles.

Equity

Methods

One of the key TETL program objectives is to provide a safe travel option for those reliant on Muni, particularly Black, Indigenous, People of Color, lower income, and unsheltered individuals. This section provides information about the equity implications of the Geary TETL Project by sharing more information about the demographics of 38/38R Geary riders who are the key beneficiaries of the project. Data considered includes information on Muni rider demographics collected through SFMTA's biennial On Board Survey, compared to census data on Richmond District and North Bay demographics as a proxy for potential impacts to people driving along Geary.

Key findings

- Geary TETL beneficiaries include a greater proportion of low-income individuals than the Richmond District population as a whole.
- Geary TETL beneficiaries include at least ~1/3 of riders who are low-income and over half who are people of color[1]. These numbers are pre-COVID and are likely higher during the COVID-19 pandemic.
- The 38/38R lines are also designated as a part of SFMTA's Equity Strategy lines because of their importance for seniors and people with disabilities for citywide accessibility[2].

Additional results

Table 3 compares 38 Geary and 38 Geary Rapid customer demographics to Muni system-wide averages, and to Richmond District, San Francisco, and North Bay demographics. While a greater proportion of 38/38R riders are low-income than the Richmond District as a whole, a greater proportion of Richmond District residents are people of color than 38/38R riders. The same is true when comparing 38/38R riders and San Francisco as a whole.

Some traffic on Geary Boulevard east of Park Presidio Boulevard also consists of commuters from Marin and Sonoma counties entering San Francisco over the Golden Gate Bridge. The population of these counties has fewer people with low incomes and substantially fewer people of color than 38 Geary and 38R Geary Rapid riders.

[1] SFMTA 2017 On Board Survey
[2] SFMTA.com/Equity

Table 3: Geary and systemwide customer demographics and Richmond District demographics (pre-COVID)[1]

	Household income below $35,000[3]	**People of Color**
38	31%	53%
38R	29%	51%
Systemwide average	26%	57%
Richmond District[4]	24%	62%
San Francisco City/County	18%	60%
Marin County[4]	18%	29%
Sonoma County[4]	25%	32%

[3] Low income households are defined by the SFMTA as those with total incomes under 200% of the federal poverty level per household size. This data was not readily available for the Richmond District, so household income under $35,000 (approximately 200% of the federal poverty level for a two-person household) is used as a proxy.

[4] American Community Survey 2019 data via city-data.com

Transit travel time

Methods

Transit travel time data for the 38 Geary and 38R Geary Rapid was processed from automated vehicle location (AVL) data collected in Muni's OrbCAD system. Travel times were calculated for the following sections of the routes, all bounded by stops served by both 38 and 38R buses:

- 33rd Avenue – Arguello (this segment covers the Geary TETL project limits)
    - 33rd Avenue – 25th Avenue (this segment includes some blocks where an emergency transit lane was installed as well as a temporary bus bulb at the 25th Avenue inbound stop)
    - 25th Avenue – Park Presidio (there are no emergency transit lanes on most blocks in this segment which includes Muni Head Start signals and bus bulbs at 15th and 20th avenues inbound and outbound;)
    - Park Presidio – Arguello (this segment includes emergency transit lanes on all blocks and bus bulbs at 6th Ave inbound and outbound stops)
- Arguello – Laguna (this segment includes active Geary Rapid Project construction, with existing transit lanes east of Stanyan)
- Laguna – Market and 1st Street (this segment has existing transit lanes and active Geary Rapid construction in the outbound direction)
- 33rd Avenue – Market and 1st Street (full length of analysis; segments in the Outer Richmond and near the Transbay Transit Center not included due to limited data availability at the terminals)

50th percentile (median) travel times were calculated for each route in each segment which approximates the typical passenger experience. Each direction was analyzed separately: inbound (IB; eastbound) and outbound (OB; westbound). The following time periods were analyzed: AM peak (7-10am), midday (10am-3pm), and PM peak (3-7pm), with all-day (7am-7pm) also analyzed. Evening and overnight hours tend to have minimal congestion, so the Geary TETL project is not expected to have significant impacts between 7pm and 7am. Weekends similarly have lower congestion, so only weekday data was used.

Key findings

Transit travel time improved where transit lanes were implemented despite increases in traffic. There was a modest overall decrease in travel times on the Geary TETL segment from COVID Fall (September/October 2020) to TETL Spring (March/April 2021) with savings as great as about 4% or 30 seconds. Figure 13 and Figure 14 show changes across the Geary TETL segment for all day and peak hour, peak direction travel times (AM eastbound/inbound and PM westbound/outbound). While the travel time improvement is relatively small, it is significant in that this change occurred in parallel to an increase in citywide traffic consistent with greater trip-making as public health restrictions have eased (discussed more in the Traffic section below). Typically, when traffic congestion slows down private vehicle speeds, bus speeds slow down more dramatically, so an improvement in bus speeds while traffic has increased indicates the effectiveness of the Geary TETL improvements.

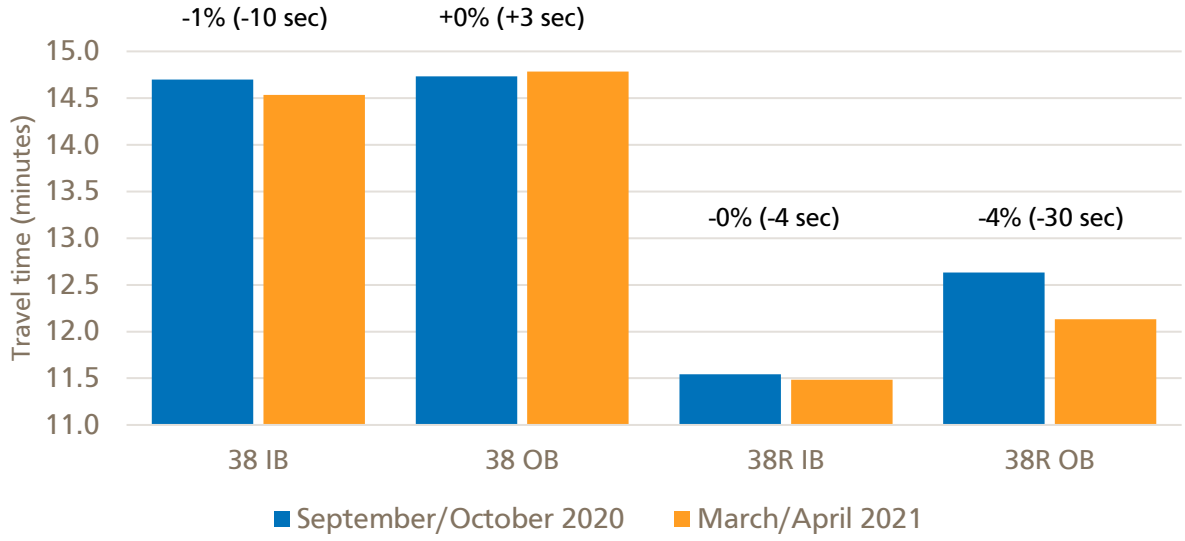

Figure 13: All-day (7am-7pm) travel time on the Geary TETL segment (33rd Avenue – Arguello) before and after project implementation

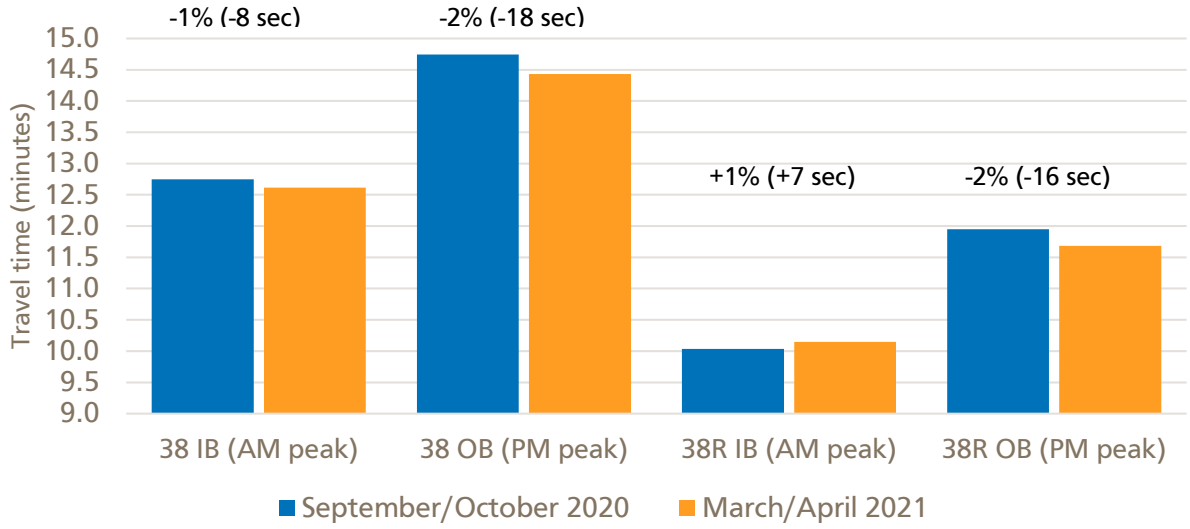

Figure 14: Peak-hour, peak-direction travel time on the Geary TETL segment (33rd Avenue – Arguello) before and after project implementation

Transit travel time improved along Geary Boulevard only where Geary TETL improvements were installed. While transit travel times decreased within the TETL limits, there was a small increase across the full 38 Geary/38R Geary Rapid routes, indicating that the Geary TETL project is resulting in reduced travel times. Figure 15 compares travel time changes on the Geary TETL segment and the full route.

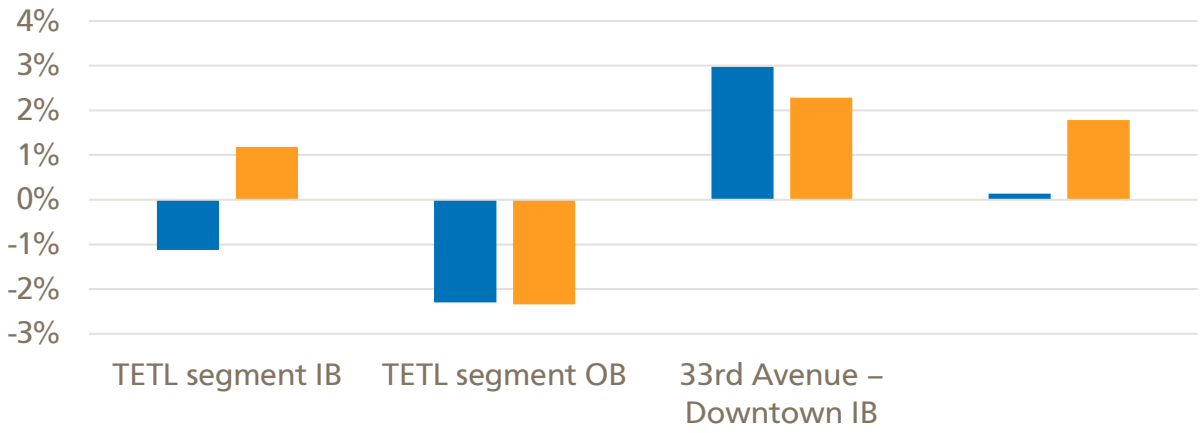

Figure 15: Peak-hour peak-direction travel time changes since fall 2020, with the TETL segment compared to the full routes

The largest transit travel time savings were where continuous transit lanes were installed between Arguello and Park Presidio. Within the Geary TETL area, the Park Presidio – Arguello segment showed the most significant improvements in travel times for both local and Rapid buses, indicating that the transit lanes were the most effective of the Geary TETL treatments in allowing buses to bypass congestion. The improvements were greater for the local buses, likely because they no longer had to wait for traffic to pass before pulling out of the more frequently spaced local stops. The 33rd Avenue – 25th Avenue segment, with some sections of transit lanes, showed more modest improvement. The 25th Avenue – Park Presidio segment, which had Muni Head Start signals but not transit lanes, showed little to no improvement in travel times. Figure 16 compares travel time changes on the 25th Avenue – Park Presidio and Park Presidio – Arguello segments.

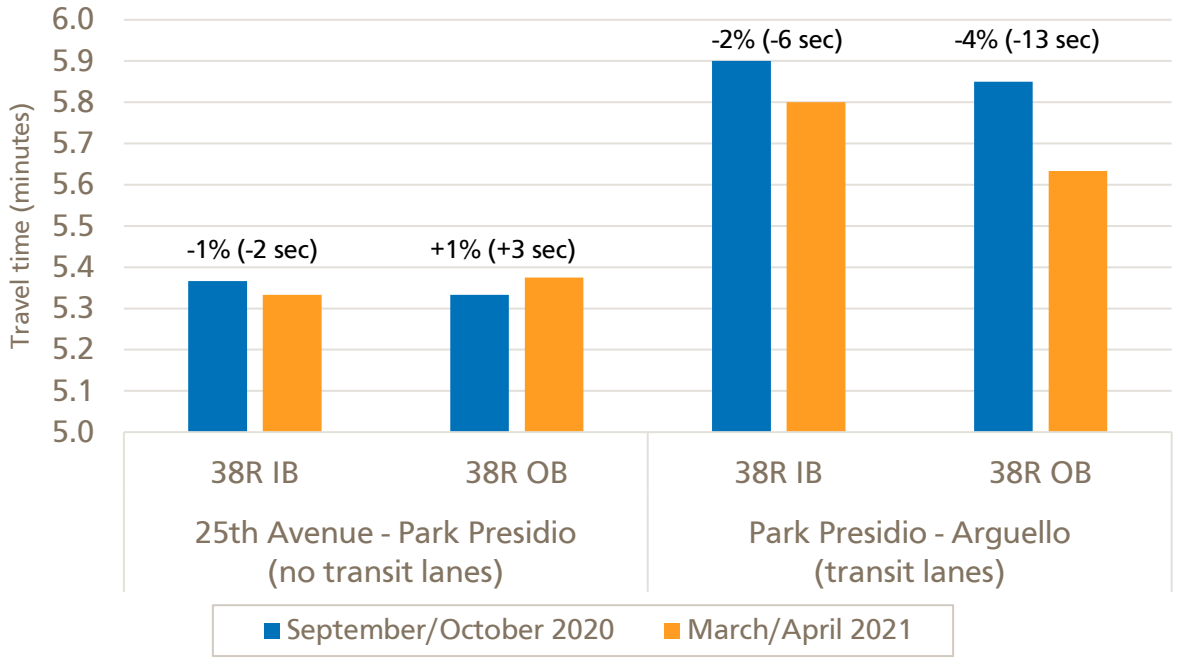

Figure 16: Changes in travel times on the 25th Avenue - Park Presidio and Park Presidio - Arguello segments

Geary TETL improvements have preserved the majority of Shelter-in-Place travel time savings.

A major goal of the TETL program was to preserve improvements in travel time that resulted from decreased private vehicle traffic in mid-2020. Figure 17 shows that the majority of these initial savings have been retained: within the TETL limits, between 46% and 71% of the initial savings in peak-hour peak-direction travel times have been retained through March/April 2021.

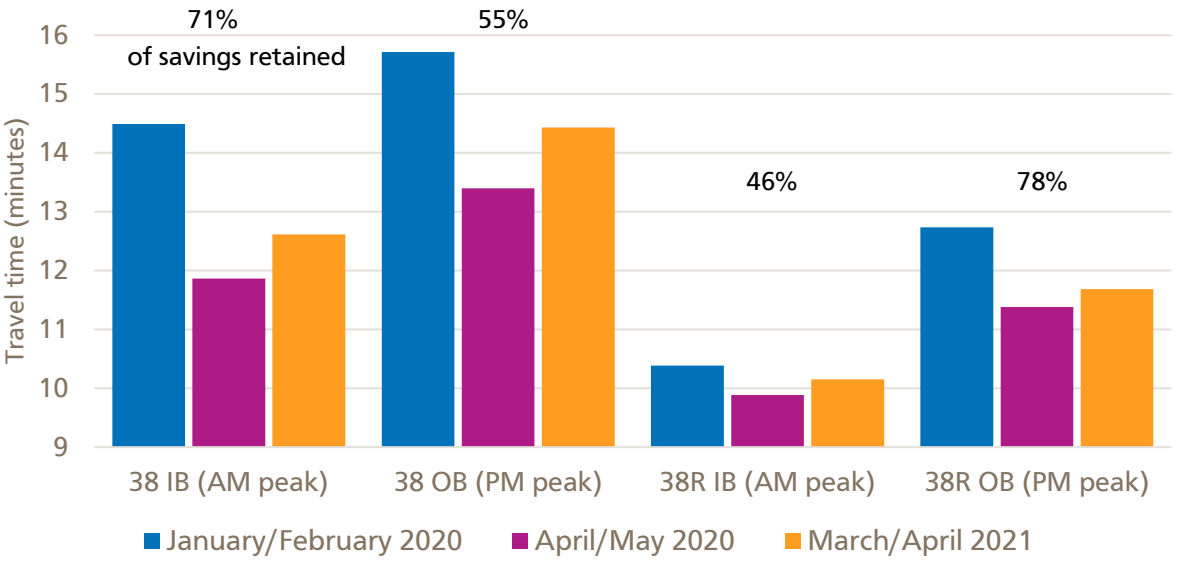

Figure 17: Peak-hour peak-direction travel time changes from January/February 2020 to April/May 2020 and March/April 2021. The proportion of initial travel time savings retained in March/April 2021 is shown above the bars.

Headway reliability

Methods

Headway refers to the amount of time between when two buses arrive; for example, buses may be scheduled to arrive every 5 minutes during peak hours. Headway reliability refers to how close to that planned headway the buses actually arrive. So, for example good headway reliability might mean buses at 5 minute headways are never more closely spaced than 4 minutes or further spaced than 6 minutes, while bad headway reliability might mean you might sometimes be waiting more than 10 minutes for the bus. This metric is key to passenger experience, as it affects both travel time (passengers must wait longer for a late bus) and crowding (more passengers will arrive at stops before the late bus arrives). Unreliable service is subject to bus bunching, wherein less-full early buses tend to catch up to more-full late buses, causing longer gaps between trips. By reducing variability in travel times, transit lanes can reduce headway variability.

Headway reliability was measured using an internal SFMTA dashboard based on OrbCAD data. SFMTA service standards consider a bus to be bunched if it arrives at a timepoint within two minutes of the previous bus. A bus is considered gapped if it arrives five or more minutes after the scheduled headway.

In mid-2020, the SFMTA switched from schedule-based dispatching (where buses are dispatched from terminals on a fixed schedule regardless of the actual previous departure, and may hold at timepoints to match the schedule) to headway-based dispatching (where buses are dispatched from terminals at consistent intervals, and do not hold mid-route for schedule adjustments). This makes direct comparison of headway reliability before and after this change less meaningful. For this reason, only reliability from fall 2020 onward was analyzed.

Key findings

38R maintained 85-90% headway adherence

As shown in Figure 18, headway reliability for 38R Geary Rapid buses was consistently around 85-90% from September 2020 to May 2021, with very few bunched trips and around 10% gapped trips. As shown in Figure 19, headway reliability for 38 Geary buses was lower – around 70% - with greater numbers of bunched and gapped trips. There was not any substantial change in reliability after implementation of the Geary TETL project. This is likely explained by the following considerations:

- 38R Geary Rapid headway adherence improved after the switch to headway-based management and the reduced traffic during the COVID-19 pandemic, prior to implementation of the Geary TETL project.
- The Geary TETL improvements covered only about two miles of an almost seven-mile corridor and headway adherence is affected by any delays along the entire length of the corridor. While additional improvements are underway or planned along other parts of the corridor that are intended to further improve reliability (such as the completion of Geary Rapid Project and Better Market Street improvements), it is inherently challenging

to ensure consistent travel times along portions of any route that operates in a dense downtown environment.

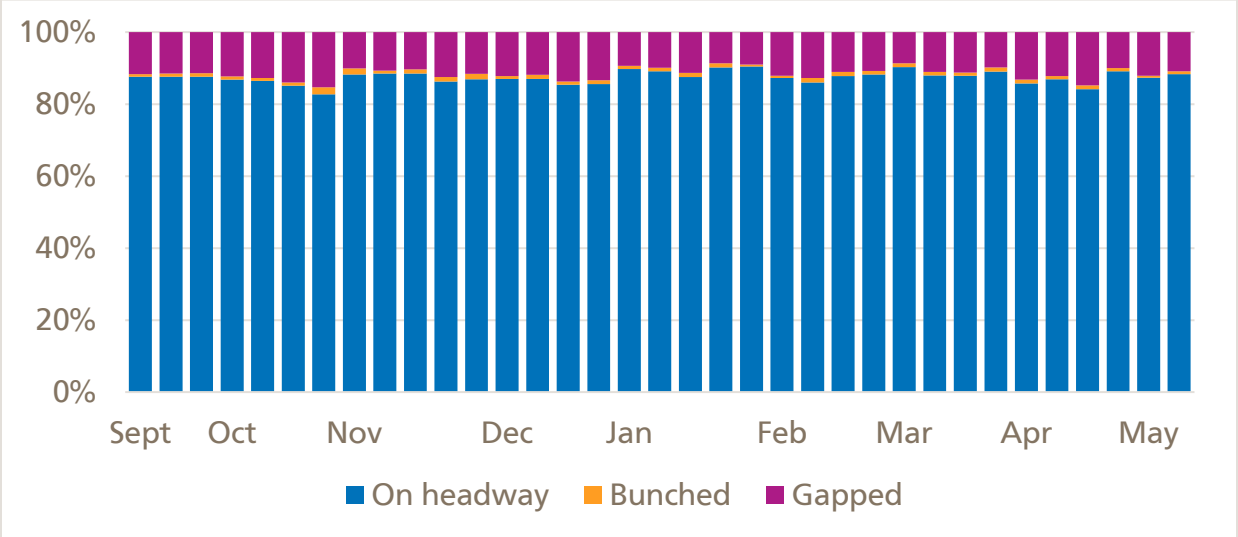

Figure 18: Headway reliability of 38R Geary Rapid buses

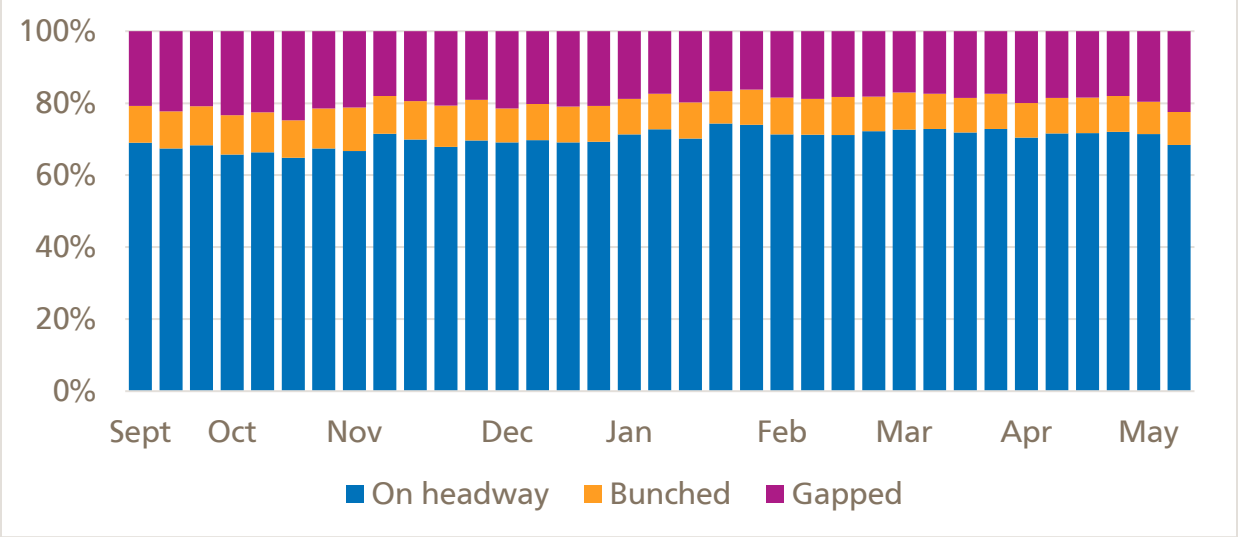

Figure 19: Headway reliability of 38 Geary buses

Crowding

Methods

Physical distancing requirements during the COVID-19 pandemic substantially reduced the capacity of passengers allowed on Muni vehicles. A 60-foot motorcoach, the type typically used on the 38 and 38R routes, is considered crowded at or above 81 passengers. The "crowding" threshold was reduced to 30 riders in March 2020 and increased slightly to 36-40 riders in April 2021. Since crowded buses are a health risk, operators have been instructed not to allow additional passengers to board once a bus reaches the crowding threshold. Crowding on a weekly basis was obtained from a public SFMTA dashboard (https://www.sfmta.com/reports/percentage-transit-trips-or-exceeding-covid-capacity). The same time periods and date ranges as the previous metrics were used.

Results

SFMTA made service adjustments to reduce pass-ups.

Changes in ridership and service levels varied substantially during the analysis period and overshadowed any potential impacts of the Geary TETL project on crowding. Figure 20 shows trends in the percent of crowded trips over time, illustrating that crowding spiked in October 2021, which is around when ridership increased during a period of greater economic reopening. Shortly thereafter, the percent of crowded trips dropped and remained lower even as ridership reached its highest levels since the start of the pandemic. This is explained by the introduction of additional bus service on the Geary corridor in late fall 2020.

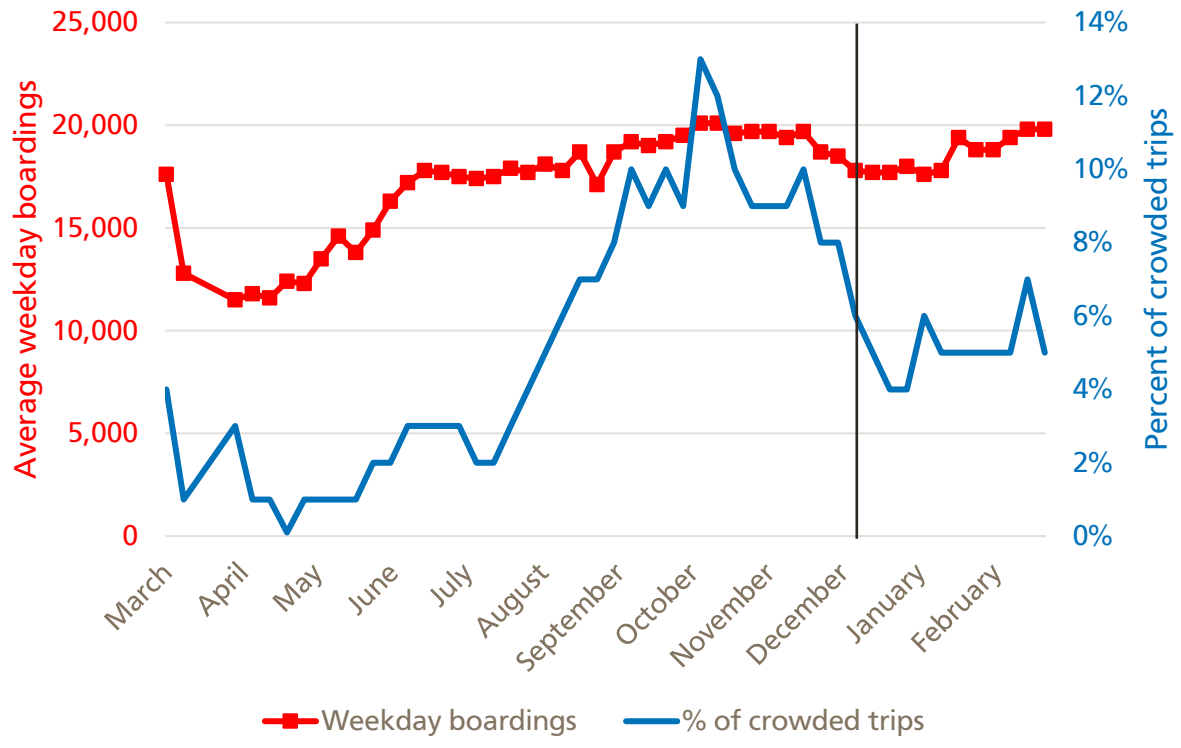

Figure 20: Ridership and percentage of crowded trips on the 38 and 38R from March 2020 to March 2021. The vertical black line indicates the introduction of additional service in December 2020.

Geary TETL improvements prevented increases in travel time that would have either exacerbated pass-ups or slowed the restoration of service in other parts of the Muni network

As discussed in the Transit Travel Time section of this report, the Geary TETL improvements generally maintained or improved transit travel time as compared to October 2021. Had transit travel time gotten slower, the total roundtrip time on the route would have decreased, effectively decreasing service frequency. The SFMTA may have also chosen to assign more buses to the corridor, however this would have come with a trade-off of lower levels of restored service in other parts of the city.

Traffic

Methods

The Geary TETL project reduced the number of through travel lanes from three to two per direction on segments where a dedicated transit lane was added. The purpose of this component of the evaluation was to understand whether the reduction in travel lane capacity increased traffic congestion on Geary Boulevard to the extent that some people driving diverted to parallel streets (referred to as "diversions", and in turn increased congestion on those parallel streets.

Analyzing changes in auto travel times and speeds on Geary and parallel streets requires contextualizing by analyzing changes in auto travel times in other "control" corridors that would not have been affected by project changes. This is particularly important in a COVID context, where there have been large changes in the overall level of trip-making in San Francisco as restrictions have lifted, COVID case counts have declined, and a large portion of the population has been vaccinated. If the project contributed to slower travel times and diversions, Geary Boulevard and parallel corridors would show greater changes in vehicle travel times than on other "control" corridors.

Traffic conditions were monitored using Inrix IQ Roadway Analytics suite (https://inrix.com/products/roadway-analytics/), which aggregates data from navigation apps, commercial vehicle GPS locations, and other sources to estimate speeds and travel times. Block-by-block average speeds were aggregated into 18 sections of road as shown in Figure 21:

- **Geary Boulevard:** 48th Avenue–33rd Avenue (including part of Point Lobos Avenue), 33rd Avenue–25th Avenue, 25th Avenue–Park Presidio Boulevard, Park Presidio Boulevard–Arguello Boulevard, and Arguello Boulevard–Masonic Avenue
- **Clement Street:** 48th Avenue–33rd Avenue (including part of Seal Rock Drive), 33rd Avenue–Park Presidio Boulevard, Park Presidio Boulevard–Arguello Boulevard, and Arguello Boulevard–Masonic Avenue (on Euclid Avenue)
- **Anza Street:** Park Presidio Boulevard–Arguello Boulevard and Arguello Boulevard–Masonic Avenue. (Reliable data was not available west of Park Presidio due to low volumes.)
- **Balboa Street:** 48th Avenue–33rd Avenue, 33rd Avenue–Park Presidio Boulevard, Park Presidio Boulevard–Arguello Boulevard, and Arguello Boulevard–Masonic Avenue (on Turk Boulevard)
- **25th Avenue:** California Street–Fulton Street
- **Arguello Boulevard:** California Street–Fulton Street

Figure 21: Road segments used for traffic and collision analyses

25th Avenue and Arguello Boulevard were selected as "control" segments, as they were not expected to be substantially affected by diversions from the Geary TETL project, did not have substantive changes to roadway conditions during the analysis period, and were in the same general vicinity as the Geary TETL project.

Only data from Tuesdays, Wednesdays, and Thursdays was used, as these tend to be the days with the highest levels of traffic. January 15 to March 25, 2021, was used for the TETL period as the most recent data available.

Key Findings

Changes in Geary auto speeds are primarily attributable to citywide increases in traffic

As shown in Table 4, there was an overall reduction in travel speeds along Geary Boulevard in the project area since fall 2020. This overall reduction in speeds along Geary was similar to reductions in travel speeds on control major arterials that would not have been affected by Geary TETL changes and is therefore likely generally an indicator of an overall increase in trip-making as public health restrictions have loosened.

Table 4: Change in average traffic speed, AM and PM peaks, September/October 2020 vs. January–March 2021

Geary Boulevard	Control streets (25th Avenue, Arguello)	Parallel streets (Clement/Euclid, Anza, Balboa/Turk)
-8 to -10%	-6% to -9%	-2 to -4%

Table 5 presents Geary change-in-travel-speed data on a more disaggregate level. In the AM inbound direction, the largest decreases in average speeds on Geary Boulevard were between Park Presidio Boulevard and Masonic Avenue. As these decreases occurred both in the Geary TETL area and outside (Arguello to Masonic) – in most cases, with larger decreases east of

Arguello Boulevard outside the project limits – it is likely that this largely reflects increased citywide traffic as well as increased regional traffic from Park Presidio/State Route 1 rather than congestion arising from the project.

There was a decrease (15%) in westbound PM peak traffic speeds between Arguello and Park Presidio, which was larger than the decrease east of Arguello (11%). Part of the reduction in travel speeds on this segment may be more attributable to the Geary TETL changes since the reduction in speeds was greater than outside the project area. However, this speed reduction represents an approximately 25-second increase in private vehicle travel time while transit travel time along that same segment for the 38R Geary Rapid westbound/outbound improved by 30 seconds.

Table 5 – Change in average traffic speed, AM and PM peaks, Geary Boulevard by segment

	AM Inbound	PM Outbound
Geary: 48th - 33rd	4.5%	-11.3%
Geary: 33rd - 25th	-7.4%	-6.1%
Geary: 25th - Park Presidio	-9.0%	-7.4%
Geary: Park Presidio - Arguello	-16.0%	-15.0%
Geary: Arguello - Masonic	-22.3%	-11.5%

There does not appear to be a significant rate of diversions from Geary to parallel streets.
As shown in Table 4, speed changes on parallel streets were lower than on control streets, with an average peak period decrease of just 3%. This is an indicator that there is likely not a significant rate of diversion from Geary and is likely due to a citywide increase in traffic. From September/October 2020 to January–March 2021, citywide estimated vehicle miles traveled (VMT) increased about 3%, while average arterial peak-hour speeds decreased by 2-3%.[5] Another reference point is that according to Apple's Mobility Report for San Francisco, the number of routing requests for driving directions has returned to pre-pandemic levels, likely an indicator that citywide traffic levels have resumed to close to pre-pandemic levels.[6]

Slower traffic speeds are consistent with stakeholder perceptions. In the stakeholder survey, about half of people driving perceived that driving on or near Geary Boulevard got more difficult since installation of the Geary TETL in January of 2021 (see Figure 7, page 9) which is consistent with the overall decrease in traffic speeds on and near Geary, and citywide, during the analysis period.

[5] Data from San Francisco County Transportation Authority COVID-era Congestion Tracker. VMT metric is derived from speed. https://covid-congestion.sfcta.org/
[6] https://covid19.apple.com/mobility

Additional Results

Further results broken down by corridor, time of day, and segment are in Table 6 and Table 7.

Color scale used for Table 6 and Table 7

-20%	-10%	0%	10%	20%

Table 6: Average change in travel speed by corridor and time of day, September/October 2020 to January–March 2021

		AM	PM	All day
Geary	**EB**	-7.6%	-7.1%	-8.4%
	WB	-7.5%	-3.8%	-10.5%
Clement / Euclid	**EB**	-3.1%	-2.3%	-2.3%
	WB	-0.9%	-2.5%	-3.0%
Anza	**EB**	-6.2%	-4.1%	-1.6%
	WB	-0.9%	-0.7%	-0.7%
Balboa / Turk	**EB**	-5.6%	-2.0%	-1.7%
	WB	-3.2%	-2.8%	-3.5%
25th Avenue (control)	**NB**	0.7%	-8.9%	-6.1%
	SB	-9.4%	-1.8%	-1.6%
Arguello (control)	**NB**	-9.9%	-5.8%	-5.5%
	SB	-8.1%	-7.0%	-4.9%

Table 7: Average change in travel speed by segment and time of day, September/October 2020 to January–March 2021

		AM	PM
Geary: 48th - 33rd	**EB**	4.5%	-2.7%
Geary: 33rd - 25th		-7.4%	-9.1%
Geary: 25th - Park Presidio		-9.0%	-10.2%
Geary: Park Presidio - Arguello		-16.0%	-11.4%
Geary: Arguello - Masonic		-22.3%	-12.2%
Geary: 48th - 33rd	**WB**	-8.9%	-11.3%
Geary: 33rd - 25th		-6.1%	-6.1%
Geary: 25th - Park Presidio		-6.3%	-7.4%
Geary: Park Presidio - Arguello		-8.2%	-15.0%
Geary: Arguello - Masonic		-6.9%	-11.5%
Clement: 48th - 33rd	**EB**	-4.2%	-1.8%
Clement: 33rd - Park Presidio		-3.5%	-1.5%
Clement: Park Presidio - Arguello		0.4%	-3.3%
Euclid: Arguello - Masonic		-5.7%	-3.0%
Clement: 48th - 33rd	**WB**	-3.1%	-2.4%
Clement: 33rd - Park Presidio		-0.3%	-0.2%
Clement: Park Presidio - Arguello		-0.7%	-6.5%
Euclid: Arguello - Masonic		0.6%	-3.4%
Anza: Park Presidio - Arguello	**EB**	-2.7%	-0.3%
Anza: Arguello - Masonic		-10.8%	-3.1%
Anza: Park Presidio - Arguello	**WB**	1.0%	0.7%
Anza: Arguello - Masonic		-3.4%	-2.7%
Balboa: 48th - 33rd	**EB**	-6.1%	-0.7%
Balboa: 33rd - Park Presidio		-4.1%	-0.9%
Balboa: Park Presidio - Arguello		-2.9%	-1.9%
Turk: Arguello - Masonic		-11.1%	-5.0%
Balboa: 48th - 33rd	**WB**	-7.6%	1.0%
Balboa: 33rd - Park Presidio		-0.7%	-2.6%
Balboa: Park Presidio - Arguello		-0.9%	-1.3%
Turk: Arguello - Masonic		-3.2%	-15.8%
25th Avenue: California - Fulton (control)	**NB**	0.7%	-6.1%
	SB	-9.4%	-1.6%
Arguello: California - Fulton (control)	**NB**	-9.9%	-5.5%
	SB	-8.1%	-4.9%

Collisions

Methods

Geary Boulevard east of 31st Avenue is part of the "High-Injury Network" – the 13% of San Francisco streets on which 75% of injury-causing traffic collisions occur. The TransBASE Dashboard (https://transbase.sfgov.org/dashboard/dashboard.php) displays the location and basic data for all traffic collisions in San Francisco involving injury or death. The data is provided by the SFMTA, San Francisco Police Department (SFPD), and San Francisco Department of Public Health (SFDPH). Collision data is updated quarterly, typically near the end of the following quarter.

Collisions were monitored on the same road segments as for traffic (see Figure 21, page 25) with monthly rates calculated. Time periods used were pre-COVID (September 2019 – February 2020), COVID (April 2020 – October 2020) and TETL (January 2021 – March 2021).

This metric has a small sample size compared to others in the evaluation – tens of collisions during each sample period, versus tens of thousands of bus trips and hundreds of thousands of auto trips. It also has longer time periods with more outside factors, including variation in vehicle volumes, weather events, construction, driver behavior, and road conditions. These factors mean there is inherently a higher degree of randomness in these results than in others in this evaluation, with less data to analyze. While the aggregated monthly averages provide some indication of overall trends, this metric is intended to be largely qualitative. For segments or locations that show a significant increase in collisions compared to others, staff will review SFPD collision reports to ensure that collisions are not being increased by traffic changes associated with the Geary TETL project nor by traffic diversions caused by the Geary TETL project.

Key findings

Overall collision rates remained approximately the same after TETL implementation. The east-west streets averaged 8.7 collisions per month pre-COVID, 6.6 collisions per month from April to October 2020, and 6.7 collisions per month after TETL implementation. Monthly collision rates by segment are shown in Table 8.

Normal variation in collision rates occurred: some segments had a small increase in collisions, while others had a small decrease. No segments or intersections showed a significant increase in collisions that would indicate a potential deterioration in safety. Collision reports were checked by SFMTA, with no collisions attributed to conditions that changed as part of the Geary TETL project.

Table 8: Monthly average collision rates in the Geary TETL area

	Pre-COVID September 2019 – February 2020	COVID April 2020 – October 2020	TETL January 2021 – March 2021
Clement: 48th - 33rd	0.0	0.0	0.3
Clement: 33rd - Park Presidio	0.2	0.4	1.0
Clement: Park Presidio - Arguello	0.2	0.3	1.0
Euclid: Arguello - Masonic	0.5	0.4	0.0
Clement / Euclid total	0.8	1.1	2.3
Geary: 48th - 33rd	0.0	0.0	0.3
Geary: 33rd - 25th	1.0	0.4	0.0
Geary: 25th - Park Presidio	0.8	0.9	0.7
Geary: Park Presidio - Arguello	1.8	0.9	1.0
Geary: Arguello - Masonic	0.8	1.0	0.0
Geary total	4.5	3.1	2.0
Anza: Park Presidio - Arguello	0.3	0.3	0.3
Anza: Arguello - Masonic	0.5	0.1	0.7
Anza total	0.8	0.4	1.0
Balboa: 48th - 33rd	0.0	0.1	0.7
Balboa: 33rd - Park Presidio	0.8	0.1	0.0
Balboa: Park Presidio - Arguello	1.3	0.7	0.3
Turk: Arguello - Masonic	0.3	0.9	0.3
Balboa/Turk total	2.5	1.9	1.3
East-west streets total	8.7	6.6	6.7
25th Avenue: California - Fulton	0.2	0.4	0.3
Arguello: California - Fulton	1.8	1.0	0.3
North-south streets total	2.0	1.4	0.7

Loading needs

Methods

A variety of uses compete for limited curb space on busy corridors like Geary Boulevard: commercial loading, passenger loading, short-term parking, long-term parking, Shared Spaces dining areas, daylighting (red curb at intersection corners) and bulb-outs to improve pedestrian visibility, and bus stops. Most of the improvements made in the Geary TETL project did not affect existing curb use: transit-only lanes west of 25th Avenue and east of 14th Avenue replaced an existing travel lane, while temporary bus bulbs were built in existing bus zones.

However, two locations did require changes in curb use. In the westbound block from 14th Avenue to 15th Avenue, four metered parking spaces were removed, and two additional metered spaces were converted to part-time commercial loading and part-time white zones, to support a Muni queue jump with a Muni-only lane and a right-turn-only lane. This configuration is shown in Figure 22.

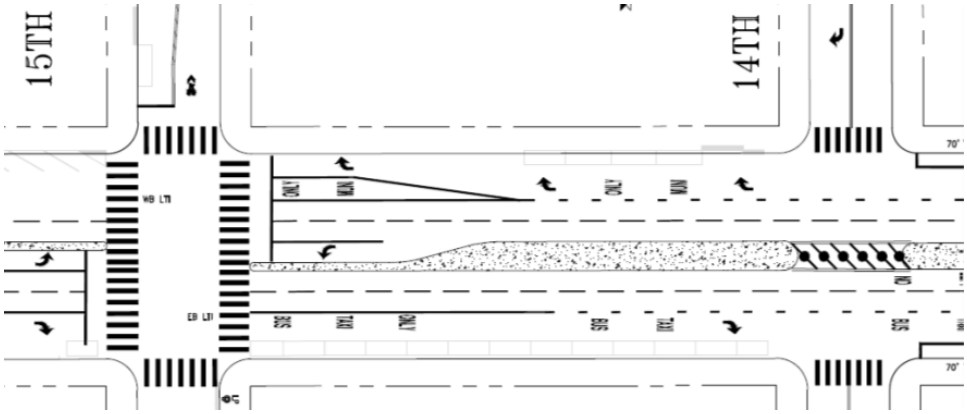

Figure 22: Geary TETL configuration between 14th Avenue and 15th Avenue

In the eastbound block from 16th Avenue to 15th Avenue, five angled parking spaces were converted to four parallel spaces to support a transit/right-turn-only lane. This configuration is shown in Figure 23.

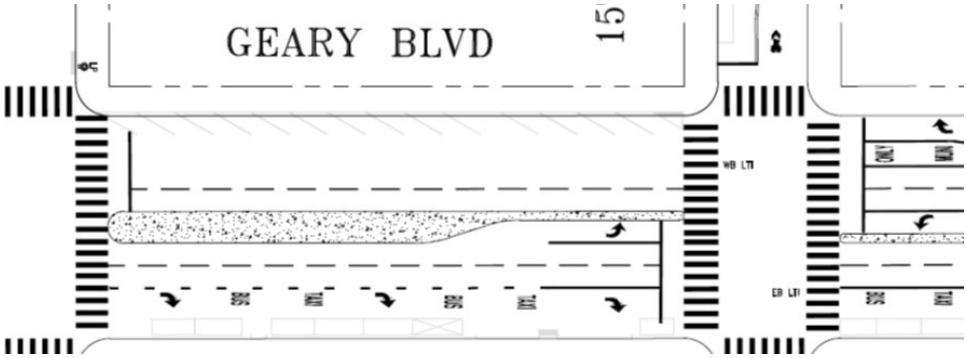

Figure 23: Geary TETL configuration between 16th Avenue and 15th Avenue

SFMTA conducted outreach to merchants on these blocks during the design of the project to ensure their loading needs would be met. Because the loading changes were so limited, loading impacts were analyzed by:

- Staff observations post-implementation
- Reporting any direct feedback from affected merchants

Results

Staff observations after implementation indicated that parking availability was similar to surrounding blocks, and that customers were typically able to find parking nearby. Staff did not observe any increase in double or illegal parking. No concerns from affected merchants were received.

Bus stop loading area

Methods

As described in the introduction of this report, the Geary TETL project included installation of temporary wooden bus bulbs at select Rapid stops where feasible and most likely to provide benefits. Bus bulbs allow buses to stay in the travel lane, rather than pulling into the bus zone. This can reduce delays to buses, particularly at locations without a dedicated bus lane where a bus operator may need to wait for a break in traffic to merge back into the travel lane. Bus bulbs also improve accessibility by allowing buses to pull up closer to the sidewalk so customers can step onto or off of the bus from the sidewalk, a shorter distance compared to from the roadway.

In addition, because the locations where bus bulbs were installed are all busy Rapid stops, the bulbs were also intended to provide additional space for physical distancing and decrease the potential for sidewalk crowding or interruptions in pedestrian flow.

Key Findings

The bus bulbs approximately doubled the waiting area at these busy stops. Both passengers and operators commented positively on them in the surveys.

Most passengers who commented on the temporary bus bulbs remarked positively about the additional waiting room, and that it was often easier to board or exit buses because operators were able to pull closer to the bulbs than to curb stops. Some passengers commented that the bulbs did not make a difference for them. The following are some example comments that reflect these sentiments:

> *"At 20th Avenue the bus couldn't always pull the back doors to the curb because of the angled parking or cars double parking. Now they are always able to pull to the curb extension. Cars parking in bus zones has also decreased."*

> *"These stops are now much nicer places to wait for the bus, with more room for riders and pedestrians - which is always a welcome feature but is particularly nice with the imperative of social distancing.*

> *"Sorry to say, the changes did not make any difference."*

> *"I don't use these stops, but boarding seems to be faster there."*

> *"There is far more space at 20th Ave, the sidewalk used to be so congested, especially for seniors, I've even seen people get knocked over."*

Figure 24: Temporary wooden bus bulb on Geary at 20th Avenue inbound bus stop

Appendix A: Public survey questions

1. Thinking about your trips since early January, how do you most often travel on Geary Boulevard in the Richmond?
    A. Bus/Transit
    B. Walk
    C. Drive
    D. Bicycle
    E. Taxi
    F. Uber/Lyft
    G. Scooter (Lime/Spin/etc)
    H. Other
    I. I don't travel there
    J. Don't know/not sure

If answer is C, E, F (Drive, Taxi, Uber/Lyft) send them to Question #9
If answer is anything else, send them to Question #2

2. How important is it to you that Muni doesn't get delayed in traffic?
    A. Extremely important
    B. Very important
    C. Somewhat important
    D. Not very important
    E. Not at all important
    F. Don't know/not sure

3. Have you ridden the 38 Geary or 38R Geary Rapid since early January?
    A. Yes
    B. No
    C. Don't know/not sure

If answer is 3A or 3C, send them to Question #4
If answer is 3B, send them to Question #13

[Ask Questions 4-8 if 3A or C (38 rider Yes or Don't know) is selected]

4. How often do you currently take the 38 Geary or 38R Geary Rapid?
    A. Daily
    B. At least once a week
    C. At least once a month
    D. Occasionally
    E. Never
    F. Don't know/not sure

5. Emergency transit lanes were installed on Geary Boulevard in the Richmond in early January. Thinking about Muni's reliability since then, would you say the 38 Geary or 38R Geary Rapid is:
    A. More reliable
    B. About the same
    C. Less reliable
    D. Don't know/not sure

6. Thinking about your travel time on Muni since early January, would you say the 38 Geary or 38R Geary Rapid is:
    A. Quicker
    B. About the same
    C. Slower
    D. Don't know/not sure

7. Thinking about the overall quality of your Muni trips since early January, would you say the 38 Geary or 38R Geary Rapid is:
    A. Better
    B. About the same
    C. Worse
    D. Don't know/not sure

8. New bus boarding platforms were recently installed at 6th, 20th and 25th avenues. Has your waiting experience changed at any of these stops since then?
    A. Open-ended

Whatever the answer is, send them to Question #13

[Ask Question 9 if 1C, E, F (How do you travel? Drive, Taxi, Uber/Lyft) is selected]

9. Emergency transit lanes and parking changes were installed on Geary Boulevard in early January. Since then, how would you describe driving on or near Geary between Stanyan Street and 33rd Avenue?
    A. Easier
    B. About the same
    C. More difficult
    D. I don't drive there
    E. Don't know/not sure

If answer is 9C, send them to Question #10
If answer is anything else, send them to Question #11

[Ask Question 10 if 9C (More difficult) is selected]

10. How is driving more difficult on or near Geary Boulevard between Stanyan Street and 33rd Avenue?
    A. Open-ended

Answer is open-ended, send them to Question #11

11. How would you describe parking on or near Geary Boulevard between 14th and 16th avenues since early January?
    A. Easier
    B. About the same
    C. More difficult
    D. I don't park there
    E. Don't know/not sure

If answer is 11C, send them to Question #12
If answer is anything else, send them BACK to Question #2

[Ask Question 11 if 10C (More difficult) is selected]

12. How is parking more difficult on or near Geary Boulevard between 14th and 16th avenues?

A. Open-ended

Answer is open-ended, send them BACK to Question #2

[Back to asking everyone]

13. Thinking about traffic safety, since emergency transit lanes were installed in early January how safe do you feel walking along or across Geary Boulevard in the Richmond?
    A. Safer
    B. About the same
    C. Less safe
    D. I don't walk there
    E. Don't know/not sure

14. Emergency transit lanes are a temporary measure to benefit those who rely on Muni. Would you support making them permanent?
    A. Definitely support
    B. Probably support
    C. Neither support nor oppose
    D. Probably oppose
    E. Definitely oppose
    F. Don't know/not sure

15. Is there anything you'd like to add about the emergency transit lanes or service for the 38 Geary or 38R Geary Rapid?
    A. Open-ended

Demographic questions

16. What is your age?
    A. 18 or under
    B. 19-24
    C. 25-34
    D. 35-44
    E. 45-54
    F. 55-64
    G. 65-74
    H. 75 or over
    I. Don't know/not sure
    J. Prefer not to answer

17. How do you describe your gender identity?
    A. Female
    B. Male
    C. Transgender
    D. Gender Non-binary
    E. Another gender
    F. Don't know/not sure
    G. Prefer not to answer

18. With what race and/or ethnicity do you identify?

A. Asian, Pacific Islander
B. Black, African American
C. Hispanic, Latinx
D. Middle Eastern, North African
E. Native American
F. White
G. Other
H. Don't know / not sure
I. Prefer not to answer

[Ask Question 19 if 18G (Other) is selected]

19. Please specify your race and/or ethnicity
A. Open-ended

20. What is your native language?
A. English
B. Cantonese
C. Mandarin
D. Spanish
E. Filipino and/or Tagalog
F. Russian
G. Vietnamese
H. Other
I. Don't know/not sure
J. Prefer not to answer

21. How well do you speak English?
A. Very well
B. Well
C. Not well
D. Not at all
E. Don't know/not sure
F. Prefer not to answer

22. Do you have a disability that currently affects your daily life?
A. Yes
B. No
C. Don't know/not sure
D. Prefer not to answer

23. What is your total annual household income?
A. Less than $10,000
B. $10,000 to $24,999
C. $25,000 to $49,999
D. $50,000 to $99,999
E. $100,000 to $149,999
F. $150,000 to $199,999
G. $200,000 or more
H. Don't know

I. Prefer not to answer

24. How many people are in your household?
    A. 1
    B. 2
    C. 3
    D. 4
    E. 5
    F. 6 or more
    G. Don't know/not sure
    H. Prefer not to answer

25. Do you or someone in your household own a car that is used for transportation in San Francisco?
    A. Yes
    B. No
    C. Not applicable/Don't know/not sure

26. What is your zip code?
    A. Open ended

27. Would you like text or email updates about the future of the temporary emergency transit lanes?
    A. Yes! Text me updates.
    B. Yes! Email me.
    C. No thanks.

[Ask Question 28 if 27A (Text) is selected]

28. What phone number would you like subscribed to project update texts?
    A. Open ended

[Ask Question 29 if 27B (Email) is selected]

29. What email address would you like subscribed to project update emails?
    A. Open ended (ensure it only accepts email formats)