

**Prop K/AA Allocation Request Forms
November 2021 Board Action
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2	Prop K	SFMTA	Advanced Technology and Information Systems (SFgo)	Bus Transit Signal Priority	Construction	\$ 1,350,883	9
3	Prop K, Prop AA	SFPW	Street Resurfacing, Street Repair and Reconstruction	Mission and Geneva Pavement Reconstruction	Construction	\$ 5,888,085	53
4	Prop K	SFMTA	Pedestrian Circulation/ Safety	Mission / Geneva Safety Project	Construction	\$ 1,391,000	63
5	Prop K	SFCTA	Transportation/ Land Use Coordination	Ocean Avenue Action Plan [NTIP Planning]	Planning/ Conceptual Engineering	\$ 275,000	83
Total Requested						\$ 10,004,968	

¹ Acronyms: BART (Bay Area Rapid Transit District); SFCTA (Transportation Authority); SFMTA (San Francisco Municipal Transportation Agency); SFPW (San Francisco Public Works)

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San Francisco
County Transportation
Authority

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	BART Accessibility Improvement Program: Public Address System and Hearing Loop
Grant Recipient:	Bay Area Rapid Transit District

EXPENDITURE PLAN INFORMATION

PROP K Expenditure Plans	BART Station Access, Safety & Capacity
Current PROP K Request:	\$1,100,000
Supervisory Districts	District 03, District 06, District 08, District 09, District 11

REQUEST

Brief Project Description

This Project is part of BART's Accessibility Improvement Program, which has prioritized accessibility improvements based on community input. The Project will upgrade current public address system at the BART/Muni Powell Street Station and install hearing loops at all of San Francisco's stations to transmit audio signals from agent booths to hearing aids. These elements will improve customer experience, safety, and accessibility, particularly for people with hearing loss.

Detailed Scope, Project Benefits and Community Outreach

BART's Accessibility Improvement Program includes multiple projects to address the needs of people with disabilities. The Public Address (PA) System and Hearing Loop Project is one of the priorities in the program. This Project was developed based on input from community members with hearing loss. The Project will upgrade current PA system at the BART/Muni Powell Street Station, one of the busiest in the BART system, and install hearing loops at San Francisco stations. The current PA system at the Powell Street Station is decades old and needs multiple upgrades to improve sound quality and speech intelligibility. The hearing loop system will transmit audio signals from agent booths to hearing aids. People who use telecoil or tcoil, a wireless feature that picks up electromagnetic signals, enabled hearing aids will be able to receive a much clearer sound from the station agent(s), as the hearing loop will make background or environmental noise less prevalent.

The Accessibility Improvement Program Evaluation and Phasing Plan included outreach, including online surveys, to the program defined user groups, based upon APTA Universal Design Guidelines. User groups were asked to score improvements based upon level of importance. Scores were tabulated and a priority list of 44 improvements was created. The user groups who participated in the survey included BART Accessibility Task Force, BART Limited English Proficiency Group, Hearing Loss Association of America, and Lighthouse for the Blind, among others. Surveys were also collected from seniors; travelers with luggage, young children; and users with limited English proficiency.

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Project Location

Embarcadero, Montgomery St., Powell St., Civic Center/UN Plaza, 16th St. Mission, 24th St. Mission, Glen Park, Balboa Park

Project Phase(s)

Construction (CON)

5YPP/STRATEGIC PLAN INFORMATION

Type of Project in the Prop K 5YPP/Prop AA Strategic Plan?	Named Project
Is requested amount greater than the amount programmed in the relevant 5YPP or Strategic Plan?	Greater than Programmed Amount
Prop K 5YPP Amount:	\$700,000

Justification for Necessary Amendment

The recommended allocation is contingent upon approval of the 2021 Prop K Strategic Plan Update and corresponding 5YPP amendments, which is the subject of a prior item on this meeting agenda.

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	BART Accessibility Improvement Program: Public Address System and Hearing Loop
Grant Recipient:	Bay Area Rapid Transit District

ENVIRONMENTAL CLEARANCE

Environmental Type:	Categorically Exempt
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PROJECT DELIVERY MILESTONES

Phase	Start		End	
	Quarter	Calendar Year	Quarter	Calendar Year
Planning/Conceptual Engineering (PLAN)	Apr-May-Jun	2018	Jan-Feb-Mar	2019
Environmental Studies (PA&ED)				
Right of Way				
Design Engineering (PS&E)	Oct-Nov-Dec	2018	Jul-Aug-Sep	2021
Advertise Construction	Oct-Nov-Dec	2021		
Start Construction (e.g. Award Contract)	Apr-May-Jun	2022		
Operations (OP)				
Open for Use			Oct-Nov-Dec	2023
Project Completion (means last eligible expenditure)			Jan-Feb-Mar	2024

SCHEDULE DETAILS

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	BART Accessibility Improvement Program: Public Address System and Hearing Loop
Grant Recipient:	Bay Area Rapid Transit District

FUNDING PLAN - FOR CURRENT REQUEST

Fund Source	Planned	Programmed	Allocated	Project Total
EP-108: BART Station Access, Safety & Capacity	\$400,000	\$700,000	\$0	\$1,100,000
BART Funds	\$0	\$0	\$2,050,000	\$2,050,000
Phases In Current Request Total:	\$400,000	\$700,000	\$2,050,000	\$3,150,000

FUNDING PLAN - ENTIRE PROJECT (ALL PHASES)

Fund Source	Planned	Programmed	Allocated	Project Total
PROP K	\$400,000	\$700,000	\$0	\$1,100,000
BART Funds	\$0	\$0	\$2,050,000	\$2,050,000
BART Funds	\$0	\$0	\$400,000	\$400,000
FTA	\$0	\$0	\$200,000	\$200,000
Funding Plan for Entire Project Total:	\$400,000	\$700,000	\$2,650,000	\$3,750,000

COST SUMMARY

Phase	Total Cost	PROP K - Current Request	Source of Cost Estimate
Planning/Conceptual Engineering	\$200,000		Costs expended to date
Environmental Studies	\$0		
Right of Way	\$0		
Design Engineering	\$400,000		Costs expended to date
Construction	\$3,150,000	\$1,100,000	Engineer's estimate at 100% design
Operations	\$0		
Total:	\$3,750,000	\$1,100,000	

% Complete of Design:	100.0%
As of Date:	07/21/2021
Expected Useful Life:	10 Years

San Francisco County Transportation Authority

Allocation Request Form

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MAJOR LINE ITEM BUDGET

Budget Line Item	Totals	% of contract	BART	Contractor
1. Contract				
Task 1a: Demolition	\$ -			\$ -
Task 2a: Electrical	\$ 1,100,000			\$ 1,100,000
Task 3a: Communication	\$ -			\$ -
Subtotal A =	\$ 1,100,000			\$ 1,100,000
Task 1b: Demolition	\$ 105,000		\$ 105,000	
Task 2b: Electrical	\$ 55,000		\$ 55,000	
Task 3b: Communication	\$ 800,000		\$ 800,000	
Subtotal B =	\$ 960,000			
Subtotal A + B =	\$ 2,060,000			
2. Construction				
Management/Support	\$ 800,000	39%	\$ 800,000	
3. Contingency	\$ 290,000.00	14%	\$ 290,000	
TOTAL CONSTRUCTION PHASE	\$ 3,150,000		\$ 2,050,000	\$ 1,100,000

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	BART Accessibility Improvement Program: Public Address System and Hearing Loop
Grant Recipient:	Bay Area Rapid Transit District

SFCTA RECOMMENDATION

Resolution Number:		Resolution Date:	
Total PROP K Requested:	\$1,100,000	Total PROP K Recommended	\$1,100,000

SGA Project Number:	108-x	Name:	BART Accessibility Improvement Program
Sponsor:	Bay Area Rapid Transit District	Expiration Date:	12/31/2024
Phase:	Construction	Fundshare:	100.0%

Cash Flow Distribution Schedule by Fiscal Year

Fund Source	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	Total
PROP K EP-108	\$0	\$400,000	\$700,000	\$0	\$0	\$1,100,000

Deliverables

1. Quarterly reports shall include photos of work being performed; and on completion of the project Sponsor shall provide 2-3 photos of completed work.

Special Conditions

1. The recommended allocation is contingent upon approval of the 2021 Prop K Strategic Plan Update and corresponding 5YPP amendments, which is the subject of a prior item on this meeting agenda.

2. The Transportation Authority will not reimburse BART for the construction phase until Transportation Authority staff releases the funds (\$1,100,000) pending receipt of evidence of completion of design (e.g. copy of certifications page or similar).

Metric	PROP K	TNC TAX	PROP AA
Actual Leveraging - Current Request	65.08%	No TNC TAX	No PROP AA
Actual Leveraging - This Project	70.67%	No TNC TAX	No PROP AA

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	BART Accessibility Improvement Program: Public Address System and Hearing Loop
Grant Recipient:	Bay Area Rapid Transit District

EXPENDITURE PLAN SUMMARY

Current PROP K Request:	\$1,100,000
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- 1) The requested sales tax and/or vehicle registration fee revenues will be used to supplement and under no circumstance replace existing local revenues used for transportation purposes.

Initials of sponsor staff member verifying the above statement:
AHDR

CONTACT INFORMATION

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San Francisco
County Transportation
Authority

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Bus Transit Signal Priority
Grant Recipient:	San Francisco Municipal Transportation Agency

EXPENDITURE PLAN INFORMATION

PROP K Expenditure Plans	Adv. Technology & Info Systems SFgo
Current PROP K Request:	\$1,350,883
Supervisory District	Citywide

REQUEST

Brief Project Description

Repair and replace the existing Transit Signal Priority (TSP) equipment along Muni routes at locations where it is nearing the end of its useful life and procure extended warranties where necessary to ensure that existing equipment continues functioning. Install new TSP equipment at certain intersections that were not upgraded when the larger corridor was equipped with TSP. Network optimization at intersections already equipped with TSP radios and antennas to maximize the benefit from each installation.

Detailed Scope, Project Benefits and Community Outreach

See attached scope description.

Project Location

Citywide

Project Phase(s)

Construction (CON)

5YPP/STRATEGIC PLAN INFORMATION

Type of Project in the Prop K 5YPP/Prop AA Strategic Plan?	Named Project
Is requested amount greater than the amount programmed in the relevant 5YPP or Strategic Plan?	Less than or Equal to Programmed Amount
Prop K 5YPP Amount:	\$1,350,883

Proposition K Sales Tax Program Allocation Request Form Bus Transit Signal Priority Scope of Work

The San Francisco Municipal Transportation Agency (SFMTA) will use the requested funds to repair or replace existing transit signal priority (TSP) related devices on buses and at signalized intersections, including radios, controller equipment and networking equipment that is nearing the end of its useful life. Requested funds will also be used for new installations at intersections that had been skipped when the larger corridor was equipped with TSP because of conflicts with unrelated construction projects or where recent projects just installed new signals. Lastly, network optimization will also be funded by this request at intersections already equipped with TSP radios and antennas to ensure that the full benefit of the capital improvement is achieved.

Locations where TSP will be repaired, replaced, and where extended warranties are necessary: The extended warranty is to service all 960 existing wireless radios installed citywide at signalized intersections equipped with TSP. Depending on location, line of sight and Muni route direction of travel, some intersections may have more than the two typical wireless radios per intersection. The attached Streets Division Communication Network map shows the fiber and wireless communication network, which is essential to the TSP system. At these same locations, silicone chips located in TSP radios, switches and antennas may need to be replaced or serviced as they start reaching the end of their useful life.

Locations where new TSP equipment will be installed:

A list of locations where SFMTA anticipates installing TSP equipment in the next few years is attached to this request, as well as a Draft Transit Signal Priority map that SFMTA staff is currently working on updating to differentiate Bus from Rail TSP and Transit Preemption. The final version of the map will be submitted to the SFCTA in addition to the list of locations included in this request.

Locations where network optimization will occur at existing TSP locations:

1. Fulton/Masonic (existing TSP, adding cross street TSP)
2. Geneva corridor between San Jose and Moscow

The primary equipment to be repaired, replaced, or covered by extended warranties through the requested allocation will be:

- Intersection-installed radios to communicate with the radios on the buses
- Phase selector cards to be installed inside traffic signal controller cabinets. These are used to translate information from intersection TSP radios to traffic signal controllers.
- Wireless radios to provide remote access to connect to TSP intersections to monitor activity and to pull maintenance logs.
- Cables, Ethernet cords, mounting brackets to install and connect TSP intersections equipment to the network.

Some of the necessary equipment has been purchased with prior funds. The subject request will fund additional equipment purchases, labor costs for signal timing engineering and

Proposition K Sales Tax Program Allocation Request Form
Bus Transit Signal Priority Scope of Work

equipment installation, and extended warranties for certain existing equipment to ensure continued manufacturer support.

Because of the high variation in cost, SFMTA estimates the requested funds will be sufficient to activate 5 intersections on the low end to 20 intersections on the high end. The exact number of intersections with TSP installations or upgrades will depend on the condition of the existing signal infrastructure (e.g., conduits, signal controllers, networking equipment). Installation costs vary from \$15,000 to \$75,000 per intersection. Factors affecting cost include need for updated controller firmware; controller cabinet must be upgraded to accommodate additional equipment; existing conduits in bad condition; there is already an existing TSP radio at an intersection but no wireless radio for a network connection; need for a fiber optic connection because the bandwidth of the wireless radio is limited by poor line-of-sight or distance. For newly signalized intersections, the cost of installing TSP equipment will depend on the need for a fiber optic connection. Whenever possible, other capital resources will be used to minimize the costs for new TSP installations. See attached list of locations where SFMTA is planning to install new TSP equipment over the next few years pending further feasibility analysis.

SFMTA will continue implementing network optimization to ensure that the full benefit of the capital improvement is achieved. Finishing these improvements allow SFMTA to maximize the benefit from each installation, providing lessons learned to minimize the work needed to achieve the same benefit on expansion intersection on the local network. Examples of network optimization work completed in the last few years are:

a. In 2019, SFMTA did a test of TSP settings to determine the optimum configuration of the TSP signal timing parameters. SFMTA tested 5 intersections along Mission (17th to 23rd) with four scenarios of TSP off (baseline), TSP on, TSP on + remote and TSP on + remote +adaptive priority. While basic TSP can achieve 2-5% travel time savings, SFMTA reduced traffic signal delays by up to 50% and reduced percentage of buses stopped at intersections by 5% to 13%. SFMTA also learned that basic TSP is effective on its own and adding advanced features such as adaptive priority (adjusting the bus travel time in response to changes by time of day) actually reduced TSP's effectiveness. Thus, as a result of this study, SFMTA removed some of the more complicated features, including Travel Time Slack and Remote Detectors. The Travel Time Slack is a parameter that accounts for the uncertainty of the actual travel time of the transit vehicle from the local detector to the intersection, by providing extra time for a transit arrive after its anticipated arrival time before dropping a transit call. Engineers and electricians removed Travel Time Slack after it was noticed that the slack was being fully utilized each time a bus passed, rather than only when extra time was needed. In addition, Remote Detectors were initially set up so that buses could start calling for transit signal priority from as far as two or three intersections upstream, more than a minute and a half prior to their expected arrival at the intersection. The calls from remote detectors resulted "ghost calls" for TSP that negatively impacted buses, as the controller was unable to provide TSP when a real bus arrived because it was still recovering from the ghost bus's TSP extension. After the study at 5 test intersections along Mission found that these settings should be modified, these settings were

Proposition K Sales Tax Program Allocation Request Form Bus Transit Signal Priority Scope of Work

updated at other intersections that had already been implemented on the Mission, Geary and San Bruno corridors.

b. In 2020, multiple TSP settings for intersections along the 8-Bayshore were optimized to implement lessons learned along other corridors over the last few couple years. One of the main improvements implemented was to configure the approach zone box for each applicable vehicle phase by setting the starting point to the midpoint of the local intersection. By default, the approach zone now extends to 1000 feet away from where the starting point is set. The purpose of this change was for the starting point to be within the midpoint of the intersection to account for GPS accuracy and so that buses stopped at the nearside of the intersection will still be able to be detected within the approach/threshold zones. Another change made was to ensure that channels were not skipped if there were missing vehicle phases in the traffic signal controller. SFMTA's vendor informed SFMTA staff that these values are being used for reporting/logging purposes and for the data to be accurate it was recommended that these values are set as described above, i.e., do not skip channels for missing vehicle phases.

SFMTA, with the TSP vendor support, will also use the requested funds to further develop the integration between the bus radios and the TSP equipment to pull second-by-second GPS location pings and other useful data, such as route and schedule adherence, gapping, bunching, passenger count, etc. This process is still in the development stage but once implemented, SFMTA will be able to provide conditional priority to be able to prioritize which buses will receive TSP at transit-heavy intersections. Currently, SFMTA is only able to provide bus TSP on a first-come first-served basis, but these additional features would allow SFMTA to prioritize buses based on their route, such as prioritizing a rapid bus over a local bus, or an inbound bus versus an outbound bus. These enhancements will allow SFMTA to prioritize providing faster, more reliable trips for the more heavily used buses. SFMTA is also exploring tools to identify locations prone to delays, which will allow for targeted traffic signal timing modifications to benefit transit. This integration will also allow SFMTA to update and deploy more reliable transit schedules.

TSP installations started citywide in 2012 with a goal of fully equipping every transit vehicle and every signalized intersection on a Muni bus route with TSP, approximately 600 intersections in all. To date SFMTA has equipped about 450 intersections with TSP, including all the Muni Rapid route corridors.

Benefits: The benefits from the proposed investment will include the following:

(1) Improved transit performance - TSP is used to extend green lights or to bring up green lights earlier to prioritize transit vehicles that are approaching the intersection. TSP improves the odds that a transit vehicle sees a green light and will endure reduced red light delay thus improving both reliability and travel times.

Proposition K Sales Tax Program Allocation Request Form**Bus Transit Signal Priority Scope of Work**

(2) Updated traffic signal timing to latest standards – Signal timing will be updated with new installation of TSP equipment to reflect the latest standards for Yellows, All-Reds and pedestrian clearance.

(3) Remote monitoring – Installed equipment will allow SFMTA to remotely check into an intersection and observe current traffic signal timing and produce maintenance logs to review timestamped information on when TSP calls were made, and which bus number made the call.

SFMTA can monitor the impact of TSP on transit performance through two data sources – (1) via intersection controllers and (2) via TSP radios on buses. The first method allows SFMTA to remotely check into each network-connected traffic controller front panel screen to see the current signal timing by phase and whether TSP is enabled. The second method allows SFMTA to pull data logs on each bus to see how many TSP calls have been placed, at which intersections and what times. Through the logs, SFMTA can tell if equipment is properly functioning in each intersection and bus. Some TSP features will be available remotely for staff at the Transportation Management Center to monitor. For security reasons, access to the first method of viewing traffic signal controller displays will be limited to certain traffic engineers and electricians.

Implementation: SFMTA Streets Division will (1) perform the traffic signal timing updates (2) manage the issuance and administration of the purchase orders for TSP related equipment and warranty extensions, and (3) remotely monitor TSP performance. SFMTA's Signal Shop will perform intersection installs and work with other city agencies such as the Department of Technology to help with upgrades of the existing IT network to ensure compatibility with the TSP equipment.

Attached is the 2019 Transit Signal Priority Effectiveness Evaluation. Based on the lessons learned from the 2019 report, the team tried to evaluate TSP in 2020. However, due to the changes in traffic patterns and transit routes caused by the COVID-19 pandemic, it was determined that SFMTA would not obtain reliable data. With the recent completion of the interface between the bus radios and the TSP equipment, which provides more accurate GPS and trip information, SFMTA anticipates being able to better measure the impacts of TSP and share the results based on data gathered in 2022.

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San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Bus Transit Signal Priority
Grant Recipient:	San Francisco Municipal Transportation Agency

ENVIRONMENTAL CLEARANCE

Environmental Type:	Categorically Exempt
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PROJECT DELIVERY MILESTONES

Phase	Start		End	
	Quarter	Calendar Year	Quarter	Calendar Year
Planning/Conceptual Engineering (PLAN)				
Environmental Studies (PA&ED)			Jul-Aug-Sep	2008
Right of Way				
Design Engineering (PS&E)				
Advertise Construction				
Start Construction (e.g. Award Contract)	Jul-Aug-Sep	2022		
Operations (OP)				
Open for Use			Oct-Nov-Dec	2024
Project Completion (means last eligible expenditure)			Oct-Nov-Dec	2024

SCHEDULE DETAILS

August 2008: Obtained CEQA Categorical Exemption Determination from the City and County of San Francisco.

Once the funds from Prop K FY 2021-22 are allocated, they will be spent to install TSP-related devices on an intersection by intersection rolling basis. As each intersection is completed it will be open for use. Full completion is expected by mid FY 2024/25.

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Bus Transit Signal Priority
Grant Recipient:	San Francisco Municipal Transportation Agency

FUNDING PLAN - FOR CURRENT REQUEST

Fund Source	Planned	Programmed	Allocated	Project Total
EP-132: Adv. Technology & Info Systems SFgo	\$0	\$1,350,883	\$0	\$1,350,883
Phases In Current Request Total:	\$0	\$1,350,883	\$0	\$1,350,883

FUNDING PLAN - ENTIRE PROJECT (ALL PHASES)

Fund Source	Planned	Programmed	Allocated	Project Total
PROP K	\$0	\$2,808,680	\$0	\$2,808,680
Go Bond	\$0	\$0	\$95,347	\$95,347
IPIC Funds	\$0	\$0	\$357,703	\$357,703
TSF	\$0	\$0	\$1,155,784	\$1,155,784
Funding Plan for Entire Project Total:	\$0	\$2,808,680	\$1,608,834	\$4,417,514

COST SUMMARY

Phase	Total Cost	PROP K - Current Request	Source of Cost Estimate
Planning/Conceptual Engineering	\$0		
Environmental Studies	\$0		
Right of Way	\$0		
Design Engineering	\$0		
Construction	\$4,417,514	\$1,350,883	Engineer's estimate based on labor and vendor estimates and prior TSP installation projects.
Operations	\$0		
Total:	\$4,417,514	\$1,350,883	

% Complete of Design:	100.0%
As of Date:	09/01/2021
Expected Useful Life:	15 Years

**San Francisco County Transportation Authority
Prop K/Prop AA Allocation Request Form**

Project Name: Bus Transit Signal Priority

MAJOR LINE ITEM BUDGET

CONSTRUCTION

SUMMARY BY MAJOR LINE ITEM (BY AGENCY LABOR BY TASK)

Budget Line Item	Totals	% of contract	Department of Technology	SFMTA	Contractor
Purchase Order	\$ 850,000	63%			\$ 850,000
Networking Equipment & Warranty	\$ 200,000	15%			\$ 200,000
Radio Equipment & Warranty	\$ 250,000	19%			\$ 250,000
Miscellaneous Parts	\$ 150,000	11%			\$ 150,000
Data Services *	\$ 250,000	19%			\$ 250,000
SSD Signal Shop Support **	\$ 200,883	15%		\$ 200,883	
SSD Engineering	\$ 200,000	15%		\$ 200,000	
Work Authorizations to other City Agencies	\$ 100,000	7%	\$ 100,000		
Department of Technology	\$ 100,000	7%	\$ 100,000		

Phase Grand Total (Purchase Orders+Engineering and Signal Shop Support+Work Authorizations)	\$ 1,350,883
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* Data services includes the installation of transit signal priority (TSP) equipment on vehicles, as well as providing extended warranty, maintenance and repair services to the TSP System as provided by Global Traffic Technologies. This also includes ongoing data updates, such as incorporating any schedule changes, to ensure that each bus is matched to the appropriate trip in the service schedule. Data services are required on an on-going basis to keep the TSP system functioning.

** SSD = Sustainable Streets Division of SFMTA

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Bus Transit Signal Priority
Grant Recipient:	San Francisco Municipal Transportation Agency

SFCTA RECOMMENDATION

Resolution Number:		Resolution Date:	
Total PROP K Requested:	\$1,350,883	Total PROP K Recommended	\$1,350,883

SGA Project Number:		Name:	Bus Transit Signal Priority
Sponsor:	San Francisco Municipal Transportation Agency	Expiration Date:	12/31/2025
Phase:	Construction	Fundshare:	100.0%

Cash Flow Distribution Schedule by Fiscal Year

Fund Source	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	Total
PROP K EP-132	\$0	\$450,295	\$450,294	\$450,294	\$0	\$1,350,883

Deliverables

- Quarterly progress reports (QPRs) shall include % complete to date, photos of work being performed, and delivery updates including the number and locations of the intersections upgraded with Transit Signal Priority (TSP) equipment and any other network optimization work done in the preceding quarter, work anticipated to be performed in the upcoming quarter, and any issues that may impact delivery, in addition to all other requirements described in the Standard Grant Agreement.
- With the first QPR (due January 1, 2022), SFMTA shall submit the final Transit Signal Priority map and confirm the list of bus routes and intersections at which TSP improvements will be implemented as part of the subject project.
- Upon completion of project, SFMTA shall provide a before/after study evaluating the effectiveness of the TSP improvements funded by this project.

Special Conditions

- SFCTA will not reimburse expenses for the project until the bus route and intersection locations and anticipated improvements for each location are provided by the SFMTA (anticipated January 2022).

Metric	PROP K	TNC TAX	PROP AA
Actual Leveraging - Current Request	0.0%	No TNC TAX	No PROP AA
Actual Leveraging - This Project	36.42%	No TNC TAX	No PROP AA

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San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Bus Transit Signal Priority
Grant Recipient:	San Francisco Municipal Transportation Agency

EXPENDITURE PLAN SUMMARY

Current PROP K Request:	\$1,350,883
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- 1) The requested sales tax and/or vehicle registration fee revenues will be used to supplement and under no circumstance replace existing local revenues used for transportation purposes.

Initials of sponsor staff member verifying the above statement:

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CONTACT INFORMATION

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New Transit Signal Priority (TSP) Equipment Installation List

Please note that intersections may be added or removed from this list pending further feasibility analysis and as opportunities arise. Installation of new TSP equipment for most of these intersections will depend on the conditions of the existing signal infrastructure.

1. 7th/Howard
2. 7th/Folsom
3. 8th/Howard
4. 8th/Folsom

Divisadero between Geary Boulevard and Haight Street, likely at:

5. Divisadero/O'Farrell
6. Divisadero/Ellis
7. Divisadero/Eddy
8. Divisadero/McAllister
9. Divisadero/Grove
10. Divisadero/Page

New signals to be installed by other projects:

11. Geneva/London
12. Athens/Geneva
13. Kesar/Lincoln
14. 10th Ave/Lincoln
15. Alemany/Rousseau
16. Admiral/Mission/Ney
17. Castle Manor/Mission/Maynard
18. Mission midblock/Russia/Leo
19. France/Mission
20. Mary/Mint/Mission

Fulton Corridor:

21. Arguello/Fulton
22. 6th Avenue/Fulton
23. 8th Ave/Fulton
24. 10th Avenue/Fulton
25. 18th Avenue/Fulton
26. 22nd Ave/Fulton
27. 25th Avenue/Fulton
28. 30th Avenue/Fulton
29. 36th Ave/Fulton
30. 39th Ave/Fulton*
31. 43rd Avenue/Fulton

Masonic Corridor:

32. O'Farrell/Masonic
33. Turk/Masonic
34. Golden Gate/Masonic
35. Grove/Masonic
36. Hayes/Masonic
37. Fell/Masoni
38. Oak/Masonic
39. Page/Masonic
40. Haight/Masonic

Park Presidio/Lombard/Richardson Corridor:

41. Park Presidio/Cabrillo
42. Park Presidio/Balboa
43. Park Presidio/Anza
44. Park Presidio/Lake
45. Richardson/Francisco
46. Richardson/Chestnut
47. Richardson/Lombard/Broderick
48. Lombard/Divisadero
49. Lombard/Scott
50. Lombard/Pierce
51. Lombard/Steiner
52. Lombard/Fillmore
53. Lombard/Webster
54. Lombard/Buchanan
55. Lombard/Laguna
56. Lombard/Gough
57. Lombard/Franklin

DRAFT

SFMTA Transit Signal Priority Map

October 2021

- Traffic Signal
- ▲ TSP/Preemption
- ▲ Planned TSP

Note that installation of new TSP equipment at the planned intersections depends on further feasibility analysis and conditions of the existing traffic signal



0.9 miles

Scale 1:45,696

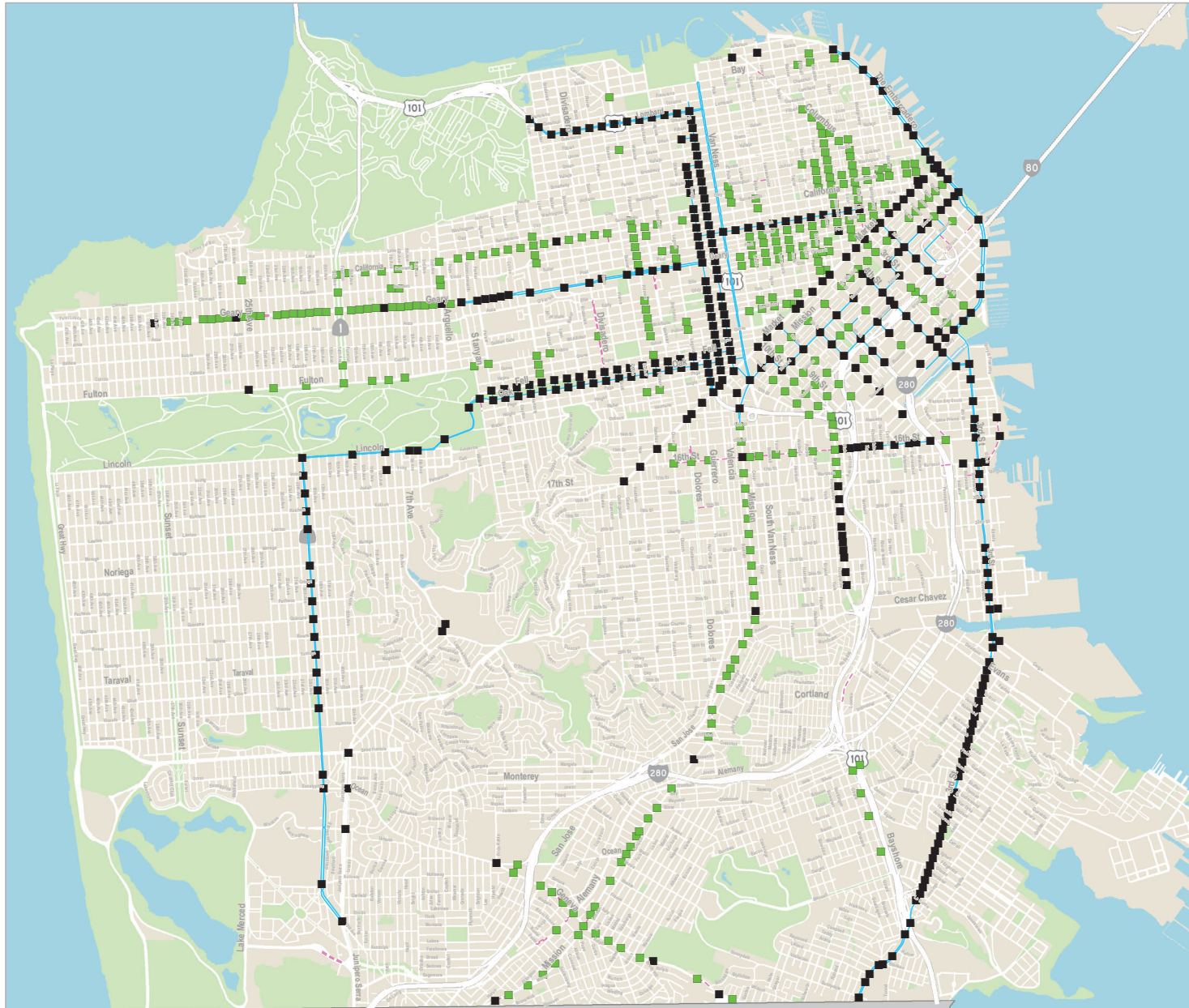
Date Saved: 10/14/2021

For reference contact: Celine.leung@sfmta.com

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SFMTA



Streets Division Communication Network

October 2021

- Fiber Backhaul
- Wireless
- SFgo Fiber
- Future Fiber
- - - Empty Conduit with Rope



0.9 miles

Scale 1:45,696

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SFMTA



2019 Transit Signal Priority Effectiveness Evaluation



Global Traffic Technologies (GTT)

7/1/2019

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Attachments

- 0 Data definition for attachments.docx
- 1 Intersection Detail.csv
- 2.1 Travel Time per Intersection.pdf
- 2.2 Travel Time per Intersection Detail.xlsx
- 3.1 Stop Rate per Intersection.pdf
- 3.2 Stop Rate per Intersection Detail.xlsx
- 4.1 Segment Travel Time.pdf
- 4.2 Segment Travel Time.csv
- 4.3 Segment Travel Time (Peak Time Only).pdf
- 4.4 Segment Travel Time (Peak Time Only).csv
- 4.5 Segment Travel Time (Distribution).pdf
- 5 Travel Time STD per Intersection Detail.xlsx
- 6.1 3 Matrices to Demonstrate TSP Effectiveness.pdf
- 6.2 3 Matrices to Demonstrate TSP Effectiveness.csv

1 Executive Summary

The Travel Time Analysis report is a summary of Transit Signal Priority (TSP) and its effects on the transit system in San Francisco for SFMTA. This collaborative effort between Global Traffic Technologies (GTT) and San Francisco Municipal Transportation Agency (SFMTA) is designed to demonstrate the following three points:

1. The TSP system is operating and working as designed
2. The TSP system is providing value in time savings to SFMTA and its users
3. The TSP system is effectively furthering the efforts to achieve the goal of being a transit-first city

In addition, this study is designed to provide guidance in optimizing the benefits of TSP.

The design of the study was a collaborative effort between GTT and SFMTA to evaluate the effectiveness of TSP on the most frequently used bus routes. SFMTA's fleet was separated into 2 groups; approximately 50% of the total fleet had TSP turned off ("TSP-off") for the baseline while the rest of the fleet kept the default mode of TSP on ("TSP-on"). Data was collected from 05/01/2019 to 06/14/2019 on 7 routes: 9, 9R, 14, 14R, 49, 38 and 38R.

The study found that the TSP-on vehicles experienced:

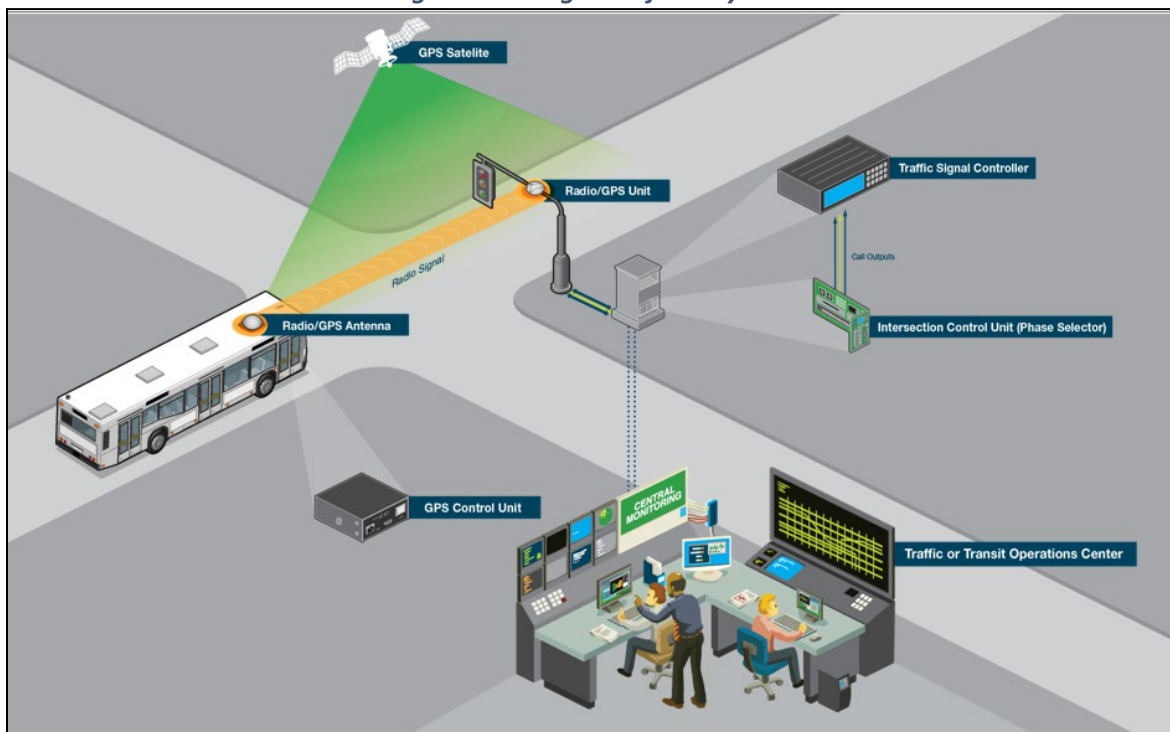
- Shorter travel time through approximately 72% of TSP-enabled intersection approaches
- Approximately 3% travel time savings through TSP-enabled segments
- Lower stop rate through approximately 71% of TSP-enabled intersection approaches

2 System Snapshot

2.1 TSP System

To understand the benefits of TSP, one must first understand the TSP system. Here is a summary of how the system works.

Figure 2-1 Diagram of TSP System



- Every TSP-equipped bus has a radio/GPS unit. The unit obtains vehicle position, speed and heading information from GPS satellites. The vehicle turn signal status is also monitored. The vehicle equipment transmits that information along with Vehicle ID and priority-level information from the onboard vehicle computer (e.g. low priority for transit, high priority for emergency) as it travels along a corridor via radio.
- As the bus travels along a corridor, Opticom Radio/GPS Units mounted on a traffic signal pole adjacent to the intersection receives the bus's information as the bus moves into range. Each intersection unit passes along the priority request to the Phase Selector located in the traffic controller cabinet.
- The phase selector evaluates if the approaching vehicle requesting priority is within a predefined approach area, the phase selector will send a request for priority to the traffic controller via a preemption input. (Note that while it is called "preemption input", the traffic controller recognizes buses as a low priority input per the onboard computer programming and will provide only TSP if conditions warrant and not emergency vehicle preemption. These criteria are pre-programmed into the traffic controller specified on each timing card. The phase selector outputs are assigned to a specific channel in GTT's phase selector software to match the

traffic controller phases for the direction of vehicle travel. The traffic controller's timing is programmed by the traffic engineers and signal shop electricians at SFMTA.

- For low priority requests, the traffic controller's preemption input is programmed to hold the green light (green extension) up to a predetermined value if certain conditions are met OR cycle to the green light (early green) for the approaching bus after serving minimum signal timing values for pedestrian, yellow and red lights.
 - A **green extension** will be provided if bus is anticipated to arrive the intersection after the light would turn red, but within the possible window for an extension.

A green extension will be provided if:

the bus's anticipated travel time
as calculated and programmed in the
signal controller from the beginning of
the GPS detection zone to the limit line
of the intersection

<

The bus signal phase's
remaining green + the
maximum extension

For example, if the travel time of a bus is 15 seconds from the beginning of the detection zone to the end of the detection zone (nearside limit line of the local intersection) and there are 8 seconds of green light remaining (if there was no TSP call) and the TSP extension value is 10 seconds – the TSP extension would be granted because the travel time value of 15 is less than the remaining green light value + TSP extension value (15 < 18).

- An **early green** will be provided, there must be available float (the difference between assigned green value and minimum green value for that phase) on the side street.

For example, if the difference between the assigned green value and minimum green value for the side street was 5 seconds, the cross street could be terminated 5 seconds earlier in order to bring up the green phase earlier for the phase with transit. Typically, major transit corridors do not use early green because the signal timing is set up to maximize the green time for the transit phase, resulting in there not being any float from the side street.

2.2 Signalized Intersections

The current rollout of TSP began in 2013 with a scope to equip the entire fleet with TSP equipment and traffic signals on rapid routes with TSP and communication equipment (for remote access). The map (Figure 2-2) shows the location of all 1200+ signalized intersections in San Francisco. There are currently 395 intersections that have TSP installed using GTT hardware of which 218 (55%) have at least one channel with TSP-enabled at the phase selector and the traffic controller. In 108 intersections, the phase selectors are operating appropriately, but are not enabled for any channels at the traffic controllers, meaning that they effectively do not provide TSP.

The initial rollout provided TSP at intersections with nearside stops and TSP extension values that were longer than the current standard. Changes in policy were made based on observations from traffic flow and operators to remove TSP at nearside stops and to reduce TSP extension values to a maximum of 20

seconds (depending on cycle length). Therefore, the number of intersections with at least one TSP-enabled channel has been reduced in recent years to the current number of 218.

Table 2-1 further shows that communication to 69 intersections is not possible and cannot be used in this study because GTT cannot verify appropriate phase selector operation per the last known phase selector update. These are defined below as “un-networked.” The reasons for un-networked intersections include: lack of easy fiber access to connect the intersection, line of sight issues that would limit functionality of wireless radios, deteriorating conduit conditions that would prohibit new installations and Opticom equipment installation that fell under a different project scope (early installation of Opticom equipment in the late 2000s were for emergency vehicles only and did not include a communication link to the intersection).

Please see Attachment 1 *Intersection Detail* for all detailed data.

Table 2-1. Count of intersections grouped by Connection Status and Number of Channels Enabled

Connection Status	>= 1 Channels enabled	0 Channels Enabled	Grand Total
Networked (“Normal”)	218	108	326
Un-networked (“Error”)	46	23	69
Grand Total	264	131	395

Figure 2-2 Signalized Intersections color coded by Connection Status and Number of Channels Enabled



2.3 Traffic Controllers

Unless the traffic controller is programmed to provide transit signal priority, the request from the bus via the phase selector will not change the signal timing. In order to quantify how frequently traffic controllers process the pre-emption requests, GTT requires traffic controller logs. Since logs of each TSP event from the controllers were not available, GTT reviewed the signal timing cards for the 106 networked intersections (49% of 218) that have TSP installed and enabled on the seven study routes to understand what types of TSP were enabled. These are shown in Figure 2-4.

Table 2-2. Count of intersections grouped by type of TSP provided

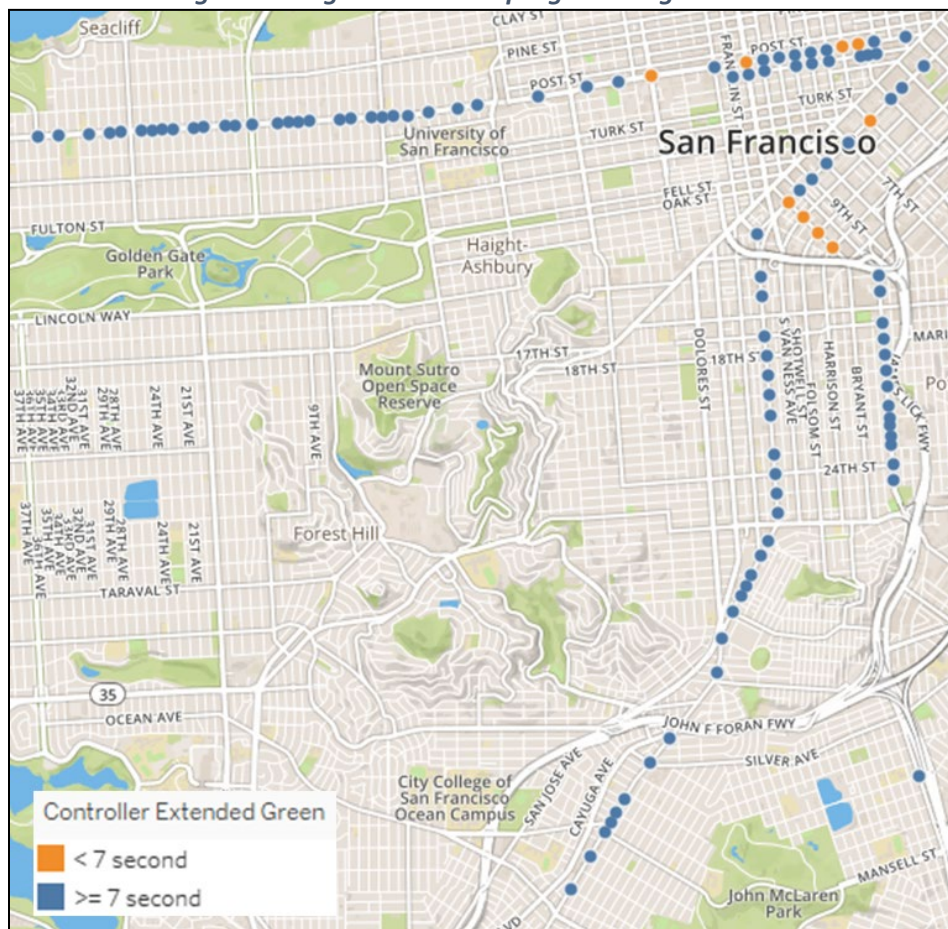
	Early Green	<7 second extension	≥ 7 second extension	Grand Total
Full Day	11*		20	20
Parts of a Day	1*	9	77	86
Grand Total	12*	9	97	106

*Early greens are excluded from the total because they are the same intersections. Only 106 intersections were evaluated for this study.

All 106 intersections have Extended Green enabled for at least part of the day. GTT recommends between a minimum of 7 seconds of green extension or early green for optimal observable impact of the TSP system, which matches SFMTA's current guidelines for transit signal priority extensions. Nine intersections have less than 7 seconds granted and are color-coded in orange; these intersections would

either have the extensions increased to 7 seconds or TSP disabled the next time the TSP settings for the intersection are revised. Twelve intersections have Early Green enabled for part of the day (e.g. during rush hour in addition to green extensions).

Figure 2-3 Signals with TSP programming reviewed



There are plans in the future to upgrade the firmware of the controller to enable further logging of events, such as timestamped TSP enabled calls and duration. Further testing needs to be done on the compatibility of the controller firmware upgrade between SFMTA signal shop electricians and the controller software vendor before the firmware is scaled for a city-wide rollout.

3 TSP Effectiveness

3.1 Travel Time per Intersection Approach

In order to evaluate the change in travel time per intersection approach, we calculated the average travel time when passing through a specified range for each approach and compared the travel time for the TSP-on and TSP-off groups. We also calculated the % of travel time improvement. See Appendix B for a more detailed explanation of the methodology, and Attachment 2 for the detailed data.

TSP-on vehicles demonstrated a **shorter travel time** through 72% of the approaches.

Table 3-1. % of approaches with travel time improvement

Route	Direction	Approaches	% of approaches travel time improved
9	inbound	17	94%
	outbound	17	71%
9R	inbound	17	71%
	outbound	17	59%
14	inbound	25	68%
	outbound	26	81%
14R	inbound	25	88%
	outbound	26	88%
38	inbound	33	61%
	outbound	36	64%
38R	inbound	33	73%
	outbound	36	47%
49	inbound	18	89%
	outbound	19	89%
Total approaches analyzed		345	72%

At a given approach, providing a green extension can provide a significant travel time benefit. For example, the design of the signal timing at intersection Mission and 7th is set up to provide green extensions only in the peak directions during peak hours, inbound during the morning peak and outbound during the evening peak times. The travel time saving for this intersection approach are much more significant during those times than the rest of the day when TSP is not enabled.

Table 3-2. Impact of green extensions at Mission and 7th

Route	Intersection	Direction	Peak time	TSP enabled	Number of Trips	TSP-Off travel time	TSP-On travel time	% change
14R	Mission and 7th	Inbound	6am-9am	Yes	275	31	27	15%
			9am-4pm	No	1,496	30	29	3%
			4pm-7pm	No	477	37	34	9%
		Outbound	6am-9am	No	359	32	32	0%
			9am-4pm	No	1834	34	33	3%
			4pm-7pm	Yes	692	36	34	7%

3.2 Stop Rate per Intersection Approach

In order to evaluate the change in stop rate per approach, we calculated the average speed for each bus when passing through a specified range for each intersection approach. If the average speed was lower than 5 mph, it was assumed that the bus stopped. We compared the resulting “stop rate” for the TSP-off and TSP-on groups. We also calculated the difference in stop rates. See Appendix C for a more detailed explanation of the methodology, and Attachment 3 for the detailed data.

The TSP -on group of vehicles demonstrated a **lower stop rate** through 71% of approaches.

Table 3-3. Stop rate per approach

Route	Direction	Approach	% of approaches stop rate improved
9	inbound	17	82%
	outbound	17	71%
9R	inbound	17	75%
	outbound	17	76%
14	inbound	25	68%
	outbound	26	71%
14R	inbound	25	84%
	outbound	26	88%
38	inbound	33	52%
	outbound	36	67%
38R	inbound	33	79%
	outbound	36	47%
49	inbound	18	72%
	outbound	19	89%
Total Approaches analyzed		345	71%

4 TSP Impact on Bus Routes Studied

The list of segments and results are below. Also see Attachment 4 Segment Travel Time for all detailed data and Appendix D for methodology.

Table 4-1 Signals with TSP enabled intersections for each segment

	Total Signalized Intersections	TSP Enabled Intersections
38/38R Inbound & Outbound		
Geary & 33 rd Ave – Geary & Park Presidio	19	14
Geary & Park Presidio – Geary & Arguello	12	9
Geary & Arguello – Geary & Divisadero	14	6
Geary & Divisadero – Geary & Van Ness	9	6
Geary & Van Ness – O’Farrell & Powell	9	9
9/9R Inbound & Outbound		
Potrero Ave & 24 th St – Potrero Ave & 16 th St	12	11
Potrero Ave & 16 th St – 11 th St & Market St	7	6
14/14R/49 Inbound & Outbound		
Mission & 5 th – Mission & 11 th	7	7
Mission & 16 th – Mission & 24 th	9	7
Mission & 24 th – Mission & Silver	16	12

Route 14, 14R & 49

Figure 4-2 Three segments studied on route 14, 14R and 49

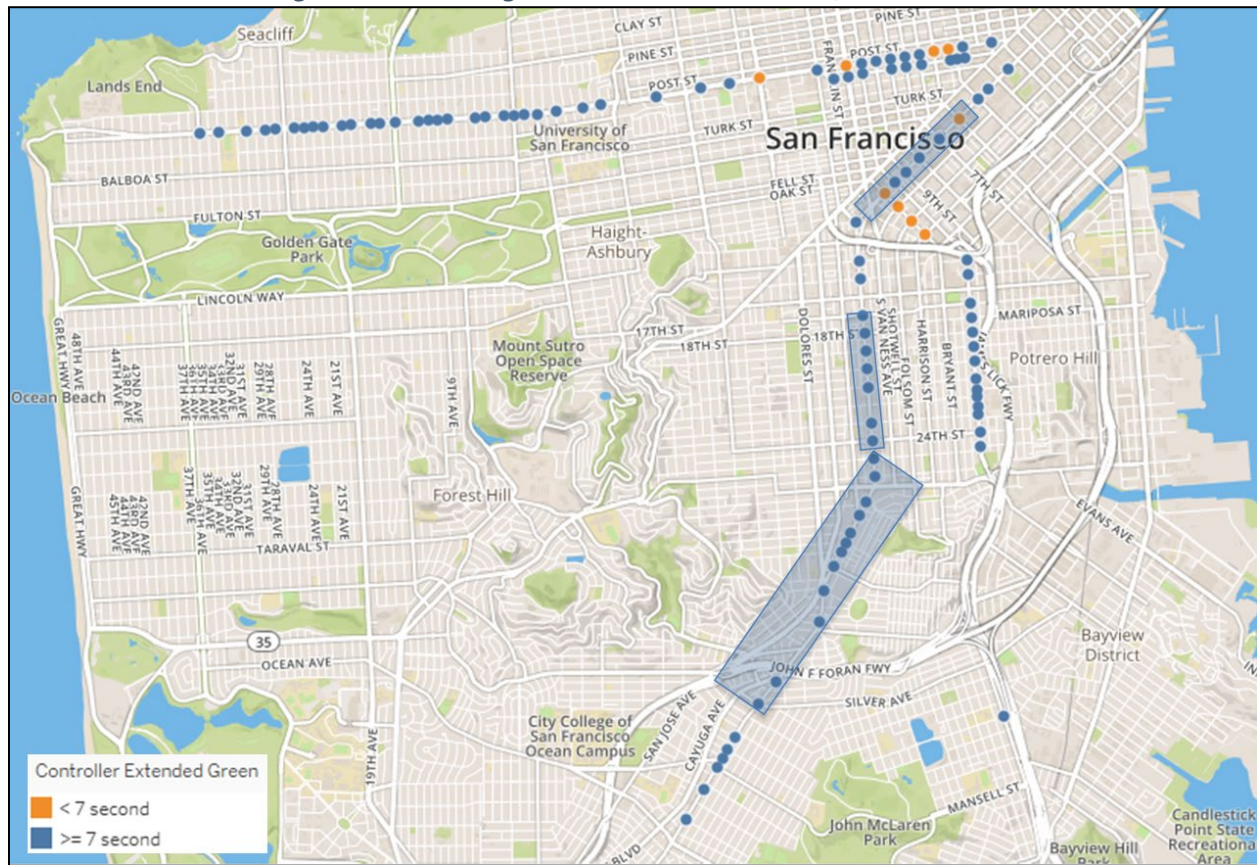


Table 4-3. Travel Time Improvement for 14, 14R and 49 segments

Direction	# of trips	Start	End	Number of Trips		Average Travel Time (s)			% Improvement
				TSP Off	TSP On	TSP Off	TSP On	Difference	
14 inbound	103	Mission & Silver	Mission & 24th	44	48	815	792	23	3%
		Mission & 24th	Mission & 16th	47	55	434	416	18	4%
		Mission St and 11th St	Mission St and 6th St	45	54	486	389	97	20%
14 outbound	158	Mission St and 6th St	Mission St and 11th St	85	75	457	413	44	10%
		Mission & 16th	Mission & 24th	86	84	466	439	27	6%
		Mission & 24th	Mission & Silver	89	90	729	703	26	4%
14R inbound	1956	Mission & Silver	Mission & 24th	983	1,029	611	607	5	1%
		Mission & 24th	Mission & 16th	983	1,028	347	342	4	1%
		Mission St and 11th St	Mission St and 6th St	899	897	367	359	8	2%
14R outbound	2135	Mission St and 6th St	Mission St and 11th St	1,155	1,201	340	325	15	4%
		Mission & 16th	Mission & 24th	1,125	1,162	397	391	6	1%
		Mission & 24th	Mission & Silver	1,132	1,168	591	587	3	1%
49 inbound	3773	Mission & Silver	Mission & 24th	1,762	2,020	800	799	1	0%
		Mission & 24th	Mission & 16th	1,758	2,014	440	441	-1	0%
49 outbound	2410	Mission & 16th	Mission & 24th	1,132	1,282	471	458	13	3%
		Mission & 24th	Mission & Silver	1,135	1,292	749	735	14	2%

Route 38 & 38R

Figure 4-3 Five segments studied on routes 38&38R

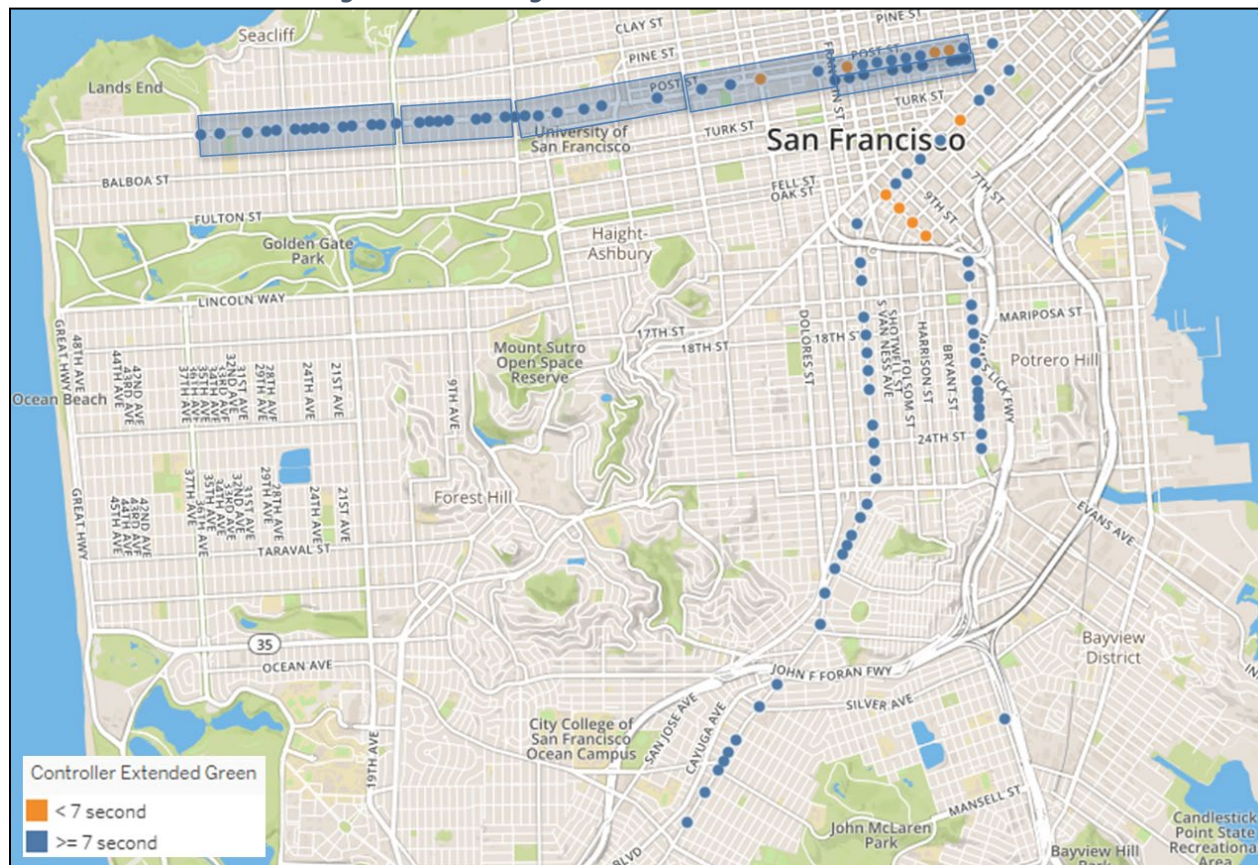


Table 4-4. Travel Time Improvement for five segments on 38 and 38R

Direction	Start	End	# of Trips		Average Travel Time (s)			% Improvement
			TSP Off	TSP On	TSP Off	TSP On	Difference	
38 Inbound	Geary & 33 rd Ave	Geary & Park Presidio	1194	1260	544	546	-2	0%
	Geary & Park Presidio	Geary & Arguello	1671	1758	343	343	0	0%
	Geary & Arguello	Geary & Divisadero	1650	1745	438	428	10	2%
	Geary & Divisadero	O'Farrell & Van Ness	1623	1710	435	424	11	3%
	O'Farrell & Van Ness	O'Farrell & Powell	1596	1676	372	364	8	2%
38 Outbound	Geary & Powell	Geary & Van Ness	1087	1104	431	434	-4	-1%
	Geary & Van Ness	Geary & Divisadero	1093	1099	443	439	4	1%
	Geary & Divisadero	Geary & Arguello	1096	1103	397	390	7	2%
	Geary & Arguello	Geary & Park Presidio	1099	1114	392	384	8	2%
	Geary & Park Presidio	Geary & 33 rd Ave	716	746	517	515	2	0%
38R Inbound	Geary & 33 rd Ave	Geary & Park Presidio	1825	1883	483	480	2	0%
	Geary & Park Presidio	Geary & Arguello	1825	1886	266	265	1	0%
	Geary & Arguello	Geary & Divisadero	1816	1895	384	378	6	2%
	Geary & Divisadero	O'Farrell & Powell	1808	1876	414	411	3	1%
	O'Farrell & Van Ness	Geary & Van Ness	1779	1865	315	311	4	1%
38R Outbound	Geary & Powell	Geary & Van Ness	947	1028	334	330	4	1%
	Geary & Van Ness	Geary & Divisadero	957	1010	408	406	1	0%
	Geary & Divisadero	Geary & Arguello	960	1012	315	306	9	3%
	Geary & Arguello	Geary & Park Presidio	953	1039	339	338	1	0%
	Geary & Park Presidio	Geary & 33 rd Ave	944	1024	446	440	6	1%

5 Factors that affect TSP results

There are several factors that can affect the TSP system performance. Many of these are not directly related to the TSP signal timing, such as variability in dwell time at bus stops, traffic congestion (especially when bus is in mixed-use lane), double parking and parking maneuvers, turning vehicles and operator behavior. This section evaluates areas where TSP results were impacted by the way that the TSP infrastructure/hardware or programming were implemented (or not implemented, at locations without TSP).

5.1 Performance results diluted when analyzing trips for full day

Traffic conditions and traffic controller settings vary greatly throughout the day for each intersection. Therefore, travel time savings can be different as well. Summarizing data for all trips passing through each segment without regard to the differing conditions will dilute the results.

Using segment from Mission & 11th St to Mission & 6th St on the 14R route as an example, the overall percent improvement for this segment is 2% for inbound trips and 4% for outbound trips.

Table 5-1. Travel Time Improvement on 14 and 14R for full day

Direction	Start	End	# of Trips		Average Travel Time (s)		Difference	% Improvement
			TSP Off	TSP On	TSP Off	TSP On		
14R Inbound	Mission & 11th	Mission & 6th	899	897	367	359	8	2%
14R Outbound	Mission & 6th	Mission & 11th	1155	1201	340	325	15	4%

However, when broken down by the hour of trip started, inbound trips show 5% - 10% saving in morning peak hours and outbound trips show 5% - 7% saving in afternoon peak hours, reflecting the times that TSP is enabled.

Table 5-2. Travel Time Improvement from Mission/11th St to Mission/6th St by hour

	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM
Inbound	6%	10%	6%	5%	0%	5%	2%	4%	0%	0%	-1%	7%	1%	
Outbound		9%	-1%	9%	1%	5%	4%	4%	5%	5%	4%	7%	-1%	3%

5.2 TSP Travel Time savings diluted by signals without TSP enabled

The segment comprising the stretch along Geary & Park Presidio and 33rd Avenue has a mix of TSP enabled and non-TSP enabled intersections. Travel time was analyzed from Park Presidio to 3 different points with increasing segment length to observe if there are gains that gets offset by non-TSP enabled intersections across the segment. This specific segment had 18 intersections with 11 TSP enabled and 7 non-TSP enabled. Greater travel time savings are observed in shorter TSP enabled segments. Longer segments show a diminished value for travel time percentage savings cumulatively because there is a greater number of non-TSP enabled intersections.

Figure 5-1 Three different size of segments start from Geary & Park Presidio

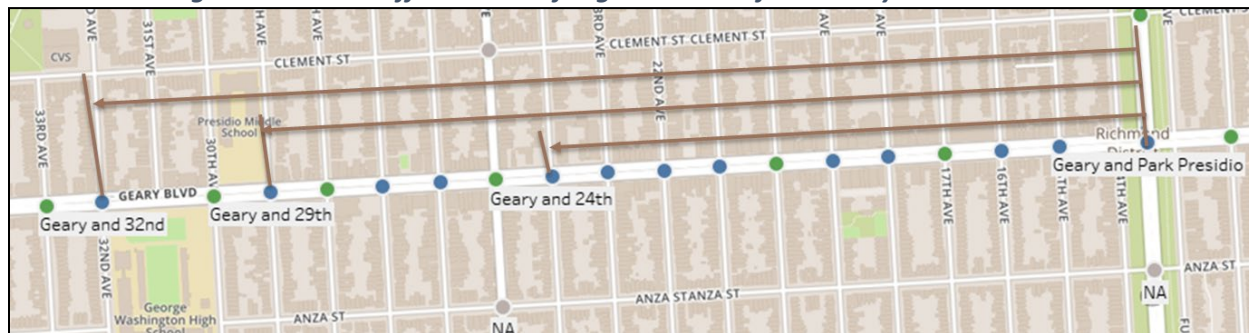


Table 5-3. The shortest segment demonstrates best % of Travel Time Improvement

Route	Direction	Segment Start	Segment End	# signals	% with TSP	Average Travel Time TSP-off (s)	Average Travel Time TSP-on (s)	% Travel Time Improvement
38	Outbound	Geary and Park Presidio	Geary and 24th	11	82%	326	318	3%
			Geary and 29th	16	69%	487	480	1%
			Geary and 32nd	17	67%	533	527	1%
38R	Outbound	Geary and Park Presidio	Geary and 24th	11	82%	327	315	4%
			Geary and 29th	16	69%	430	427	1%
			Geary and 32nd	18	67%	473	469	1%

5.3 Radio antenna mounted on one side of the road

The street view of intersection Geary and Scott inbound direction is pictured below (Figure 5-4), showing the radio antenna mounted on the south side of Geary. It captured more trips thus received more TSP requests from the inbound vehicles than the outbound ones (approximately 60% vs 40%.) For this segment from Geary/St. Joseph and Baker to Geary and Stiner, which contains 4 intersections, inbound trips travel time saving performed almost twice than outbound trips.

The existing mounting location was selected based on proximity to the traffic signal cabinet, conditions of existing conduits to pull wire through and line of sight to downstream and upstream intersections. Relocating the equipment may not be an option in this case due to tradeoffs in any of the above reasons.

Figure 5-2 Google Map street view of Intersection Geary and Scott inbound direction



Table 5-4. Calls by direction at 4 Geary intersections

Location Name	Route	% of Trips that are Inbound	% of Trips that are Outbound
Geary and Steiner	38	60%	40%
Geary and Steiner	38R	65%	35%
Geary and Scott	38	61%	39%
Geary and Scott	38R	65%	35%
Geary and Divisadero	38	61%	39%
Geary and Divisadero	38R	65%	35%
Geary/St. Joseph and Baker	38	61%	39%
Geary/St. Joseph and Baker	38R	65%	35%

Table 5-5. % of trips with travel time improvement by direction

Route	Direction	Total Signals	TSP Enabled Signals	Average Travel Time TSP Off (s)	Average Travel Time TSP On (s)	% Travel Time Improvement
38	inbound	4	3	203	191	6%
38	outbound	4	3	382	371	3%
38R	inbound	4	3	176	167	5%
38R	outbound	4	3	321	315	2%

5.4 TSP not consecutively enabled along intersections

Using the segment from Mission and Bosworth to Mission and Virginia for route 14R and 49 as an example, 4 signals have one channel enabled. These are represented as green dots in Figure 5-5. The inbound direction has 5 TSP-enabled signals and 4 of which are consecutively enabled. The outbound direction has 3 TSP enabled signals and 2 are consecutively enabled. Inbound trips demonstrated more significant improvement than outbound trips.

Figure 5-3 Example Mission segment

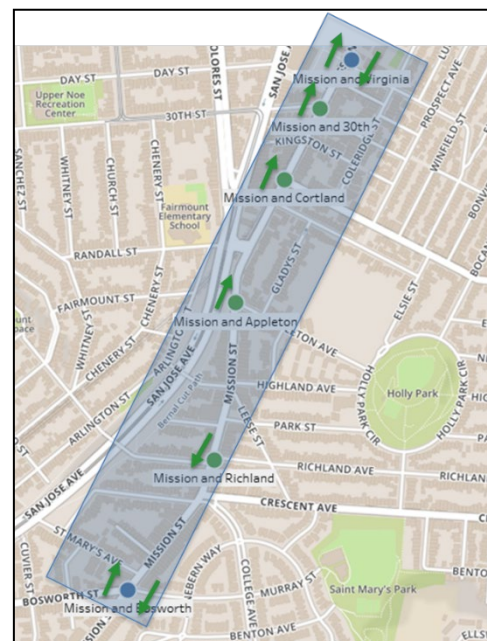


Table 5-6. TSP-enabled directions for six Mission signals

Signal	Enabled
Mission and Virginia	Both
Mission and 30th	Inbound
Mission and Cortland	Inbound
Mission and Appleton	Inbound
Mission and Richland	Outbound
Mission and Bosworth	Both

Table 5-7. % Travel time improvement by direction

Route	Direction	Total Signals	TSP Enabled Signals	Consecutively TSP Enabled Signals	Average Travel Time TSP Off (s)	Average Travel Time TSP On (s)	% Travel Time Improvement
14R	inbound	6	5	4	273	268	2%
	outbound	6	3	2	312	312	0%
49	inbound	6	5	4	357	353	1%
	outbound	6	3	2	371	370	0%

5.5 Traffic Controller green extension too short to effectively improve travel time

There are nine intersections programmed with less than 7 seconds (see section 2-3). GTT recommends the industry-standard 7 or greater to effect observable improvement in travel time performance. This is consistent with SFMTA's existing transit signal priority guidelines.

6 Travel Time Saving by Route

Routes are defined to include all intersections that have TSP installed and enabled. Signals without TSP enabled are excluded.

Figure 6-1 Segment included for route travel time study

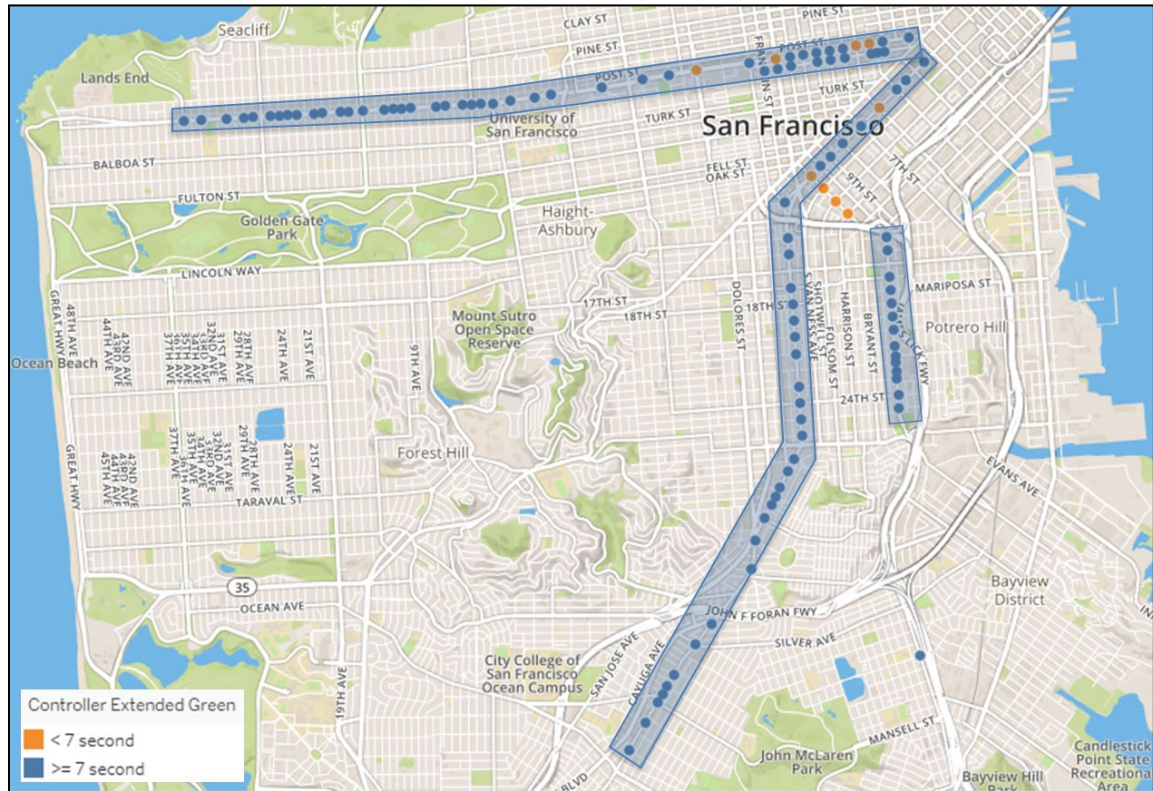
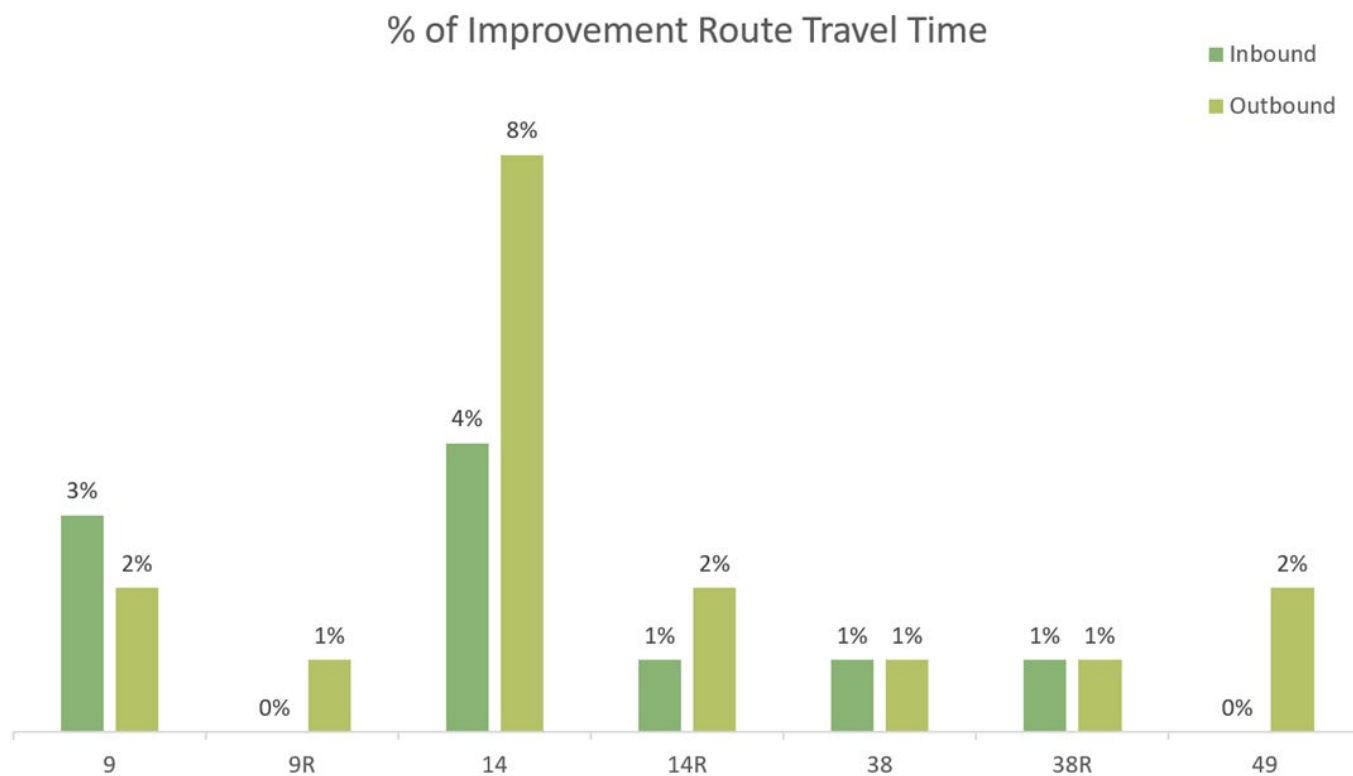


Table 6-1. Analyzed Route-segment Travel Time Improvement

Route	Direction	Average Travel Time(s) - TSP Off	Average Travel Time(s) - TSP On	Travel Time Difference (s)	# of trips	% of Improvement
9	inbound	684	665	18.7	1074	3%
9	outbound*	1148	1128	20.6	1573	2%
9R	inbound	697	699	-2.3	1628	0%
9R	outbound*	1026	1020	5.7	1630	1%
14	inbound	2474	2382	92.8	103	4%
14	outbound	2616	2414	202.3	158	8%
14R	inbound	1926	1899	27.1	1956	1%
14R	outbound	2069	2030	39.1	2135	2%
38	inbound	1988	1960	28.6	3398	1%
38	outbound	2122	2097	23.7	2760	1%
38R	inbound	1702	1687	14.7	3713	1%
38R	outbound	1757	1741	16.5	2814	1%
49	inbound	1618	1610	7.7	3773	0%
49	outbound	1484	1454	30.2	2410	2%

*See appendix E for route 9 and 9R inbound/outbound travel time difference explanation

Figure 6-2 % of Travel Time Improvement per full route (including ALL signals with or without TSP)



7 Opportunities for Improvement

Through the study, data was collected to demonstrate several opportunities for TSP-system travel-time improvements for San Francisco. GTT proposes the following action items that SFMTA may choose to employ to improve the travel times across intersections. However, we understand that there are many considerations (existing field conditions, conduit conditions, nearside bus stops, available signal time available for TSP, available funding) that may have limited SFMTA from implementing these at some locations.

1. Provide TripID information to GTT. This would increase the number of trips selected and provide additional population to study for more robust conclusions.
2. Install TSP in more intersections to increase travel times over a greater number of intersections across a greater area of the city.
3. Enable or install a greater number of consecutive TSP-enabled intersections. This improves travel time over larger segments.
4. Verify the antenna locations and orientation for optimal TSP reception at intersections. This will give the radio on the bus more direct and accurate TSP communication to the intersection phase selector.
5. Review and change the traffic controller timing settings to grant a minimum of 7 – 10 seconds at enabled intersections. This will allow enough time for the bus to take advantage of the green extension or early green.
6. Review and change the traffic controller timing settings to include all times of the day, where decreased travel times are desired. This will improve travel times during all hours of the day. Metrics including all hours for the whole system will be improved.
7. Review and change route schedule times to incorporate the TSP travel times savings. This will ensure that the savings observed using TSP are leveraged into the transit schedules.

8 Conclusion

From the study, GTT is confident that TSP makes a positive impact on the San Francisco bus transit system. When broken down to each intersection, TSP provides improved travel times and reduced stop rates through ~70% of the intersections with an average time savings of 3% for selected segments.

There are many variables affecting results that cannot be eliminated. For this reason, GTT recommends using shorter segments along each route to determine TSP effectiveness and optimization efforts. The percentage of travel time improvement is diluted by the many variables when evaluating the entire route.

GTT is committed to providing SFMTA with a TSP system to achieve its goals. We will continue discussions about the above recommendations, future capabilities and continuing collaboration.

Appendices

Appendix A Data Preparation Process and Methodology

Travel time is determined using the data from the GTT's Opticom Connected Vehicle Platform (CVP) software outputs. Since, route information was not readily available, GTT created software to predict trips. Trips executed by CVP software determination are considered for this travel time study. GTT created software to predict which trip the bus executes based on GPS and time of day from the Block ID data. This was necessary because we lack the deterministic TripID information. Since this is not a 100% deterministic approach, it results in errors and "trip aborts" which results in less data on some routes (e.g. route 14) to utilize for the study. For example, the current method may incorrectly assign a bus traveling along Mission Street the 14R route when it is actually the 14 route – when a bus then stops at a bus stop only for the 14 the onboard vehicle computer will flag this as an error and then abort the trip. This trip abort occurs because the software will only make one attempt to discern the route, make predictions on where it should be at specific times, then abort its prediction if one or more of various criteria are not met. The behavior of the TSP system will then revert to "always on" at SFMTA request. This will result in no collection of data for that bus for the rest of the trip. A new trip begins when the bus leaves the terminal.

There will be improvements in the route assignment method above once TripID is acquired from a separate bus radio through a software change. TripID will provide the correct assigned route and will no longer require the non-deterministic prediction method above, which will lead to accurate data. TripID is currently in the works to be implemented and will require a third party outside of GTT and SFMTA to implement.

Trips were broken into segments to analyze the trips more effectively. Segments were defined by SFMTA in previous studies. More detailed explanations of the segments are provided for each condition in the sections following.

GTT utilized data from its on-board GPS units to measure travel time by the total time use to pass through the identified segment that includes:

- moving time
- stop time at stops
- stop time at intersections.
- Travel times include when it moved and when it stopped

Appendix A.1 Data Pipeline Architecture

The data pipeline is established by extracting data from the mongo database installed on the SFMTA VEH server. The data is stored in in the cloud on Amazon S3. Athena databases are layered on top of the data for querying purposes. The program written for travel time calculation uses the data stored in S3 as part of daily job executions that ingest individual data inputs for all applicable data fields such as: triplogs, tripdatas, cvp settings.

Appendix A.2 Travel Time Estimator Algorithm

- Load the tripdatas/triplogs.
- Get the GPS points denoting the segments for each route/direction.
- Join tripdatas and triplogs to obtain route, direction and TSP mode for tripdatas
- Group the GPS points based on the route, direction and TSP mode
- Get the GPS point closest to the start of the segment and end of the segment while looking for the closest within 100 feet radius of the GPS points marking the start and end of segment.
- Calculate the difference from timestamp of the nearest GPS point to the start to timestamp of the nearest GPS point to the end.

Appendix A.3 Validation

- Travel time calculation application was validated by plotting GPS breadcrumbs in maps with timestamps and manually verifying the travel times.
- Programmatically, the results were cross-verified with travel times calculated using stop arrive/depart timings wherever possible.

Appendix B Methodology for Travel Time per Intersection Matrix

- SFMTA provided ranges to GTT for the definition of beginning and endpoint of intersections. GTT used these ranges for intersections with TSP installed, TSP enabled and no nearside stops
- Apply appropriate filters: excluded 5 buses didn't accept setting changes, negative travel times, and travel times greater than 10 standard deviations
- Calculate average travel time for passing through intersection range for TSP On and TSP Off respectively
- Calculate % of improvement:

(Average Travel Time for TSP Off – Average Travel Time for TSP On)

Average Travel Time for TSP Off

Example

Use the Geary and 8th Street intersection on route 38 outbound as an example (Figure 8-1). There were 1076 trips made by TSP-Off vehicles during the time of the TSP study. The average time to pass through Geary & 8th Street's 190 feet range was 7.8 seconds. While the average time to pass the same range for the TSP-ON group of vehicles was 7.4 seconds. The difference divided by 7.8 seconds rounded to 5%. This demonstrates with TSP-ON, there was 5% travel time saving for intersection Geary and 8th Street.

Figure 8-1 Example of four consecutive intersections on Geary

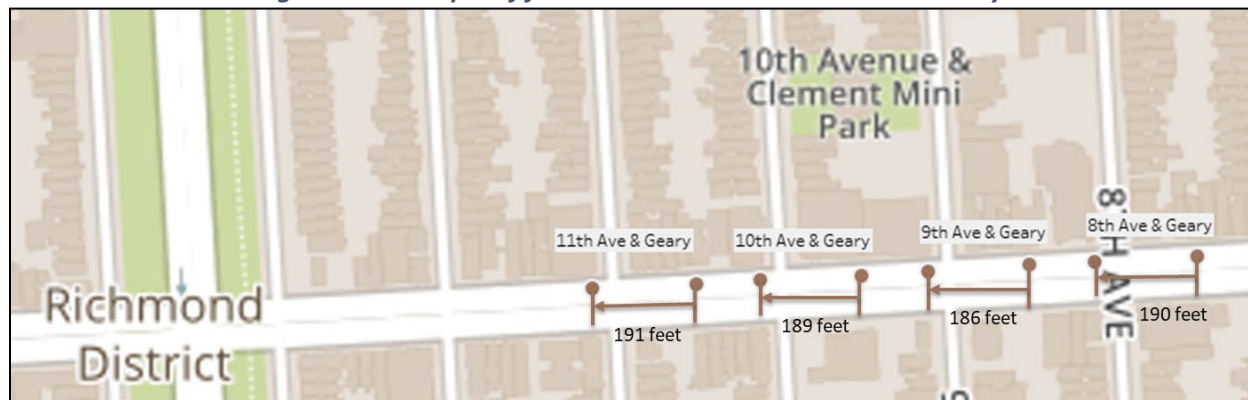


Table 8-1 Data used to calculate % of Travel Time Improvement for 4 intersections listed above

Location Name	Number of TSP-Off Trips	Average Travel Time TSP-Off (s)	Number of TSP-ON Trips	Average Travel Time TSP On (s)	% Travel Time Improvement
Geary and 8th	1,076	7.8	1,086	7.4	5%
Geary and 9th	1,090	9.6	1,095	9.0	7%
Geary and 10th	1,098	23.4	1,095	23.7	-1%
Geary and 11th	1,086	10.5	1,083	9.5	10%

Appendix C Methodology for Stop Rate per Intersection Matrix

- SFMTA provided ranges to GTT for the definition of beginning and endpoint of intersections. GTT used these ranges for intersections with TSP installed, enabled with no nearside stop
- Apply appropriate filters: excluded 5 buses didn't accept setting changes, negative travel times, and travel times greater than 10 standard deviations
- Calculate average speed passing through intersection range for TSP-ON and TSP Off respectively:

$$\text{Average Speed} = \frac{\text{Distance (ft)}}{\text{Average Travel Time}}$$

- If average speed < 5mph, consider as stopped
- Calculate % of improvement:

$$\text{Stop Rate for TSP-OFF group} - \text{Stop Rate for TSP-ON Group}$$

Example

Again, use the Geary and 8th Street intersection on route 38 outbound as an example (Figure 8-1). There were 1076 trips made by TSP-Off vehicles during time of the study. 65 (6.0%) of them had average speed slower than 5mph. The average speed of 60 out of 1086 (5.5%) trips with TSP On group was slower than

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5mph. This demonstrates with TSP On, there was a 1% stop rate improvement for the Geary and 8th Street intersection.

Table 8-2 Data used to calculate % of Stop Rate Improvement for 4 intersections listed above

Location Name	Distance (ft)	TSP Off Trips	TSP Off Stopped Trips	TSP Off Stop Rate	TSP On Trips	TSP On Stopped Trips	TSP On Stop Rate	% Stop Rate Improvement
Geary and 8 th	190	1,076	65	6.0%	1,086	60	5.5%	1%
Geary and 9 th	186	1,090	100	9.2%	1,095	83	7.6%	2%
Geary and 10 th	189	1,098	501	45.6%	1,095	493	45.0%	1%
Geary and 11 th	191	1,086	130	12.0%	1,083	103	9.5%	2%

Limitation of the Method

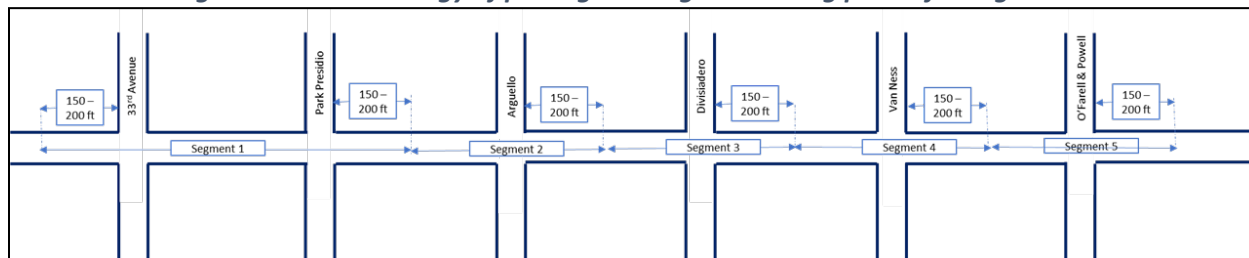
- May predict false stop or may miss actual stop since calculated speed is averaged across the range
- Due to different intersection signal timing and geometric characteristics; when applying 5mph threshold, some intersections have almost 0% stop rate while some have almost 100%

Appendix D Methodology for Segments Travel Time Analysis

Appendix D.1 Pick segment starting and ending points

- Route 38 as an example:
- First segment starts 150~200 ft before Geary and 33rd and ends 150-200 feet after Park Presidio
- Last segment ends 150~200 ft after Powell
- Middle segments are chosen such that there is no overlap. Starts where the previous ends and goes 150-200 feet after each segment

Figure 8-2 Methodology of picking starting and ending points for segments



Appendix D.2 Calculate % of travel time improvement

- Selected segments were provided by SFMTA
- Apply appropriate filters: excluded 5 buses didn't accept setting changes, negative travel times, and travel times greater than 10 standard deviations
- Calculate average travel time for passing segments for TSP-ON and TSP Off respectively
- Calculate % of improvement:

(Average Travel Time for TSP Off – Average Travel Time for TSP On)

Average Travel Time for TSP Off

Appendix E Route 9 Inbound Explanation

There is a significant difference in travel time when looking at the entire selected route between the 9 inbound and 9 outbound trips. This is due to the trip-picking algorithm that the vehicle software uses to select a trip. The software requires 2-3 bus stops to pick a trip. The first stop on the 9 inbound is at San Bruno avenue (Figure 8-3, stop 1). The next 2 stops are near Potrero and 25th (Figure 8-3, stop 2). It is near this second location that the software will pick the trip. The time difference between the two stops is approximately 12 minutes (Figure 8-4). In contrast, the outbound trips are selected in significantly less time because the stops are closer together (Figure 8-3, 3). Therefore, the outbound trips contain approximately 12 more minutes than the inbound trips.

Figure 8-3 9 and 9R map

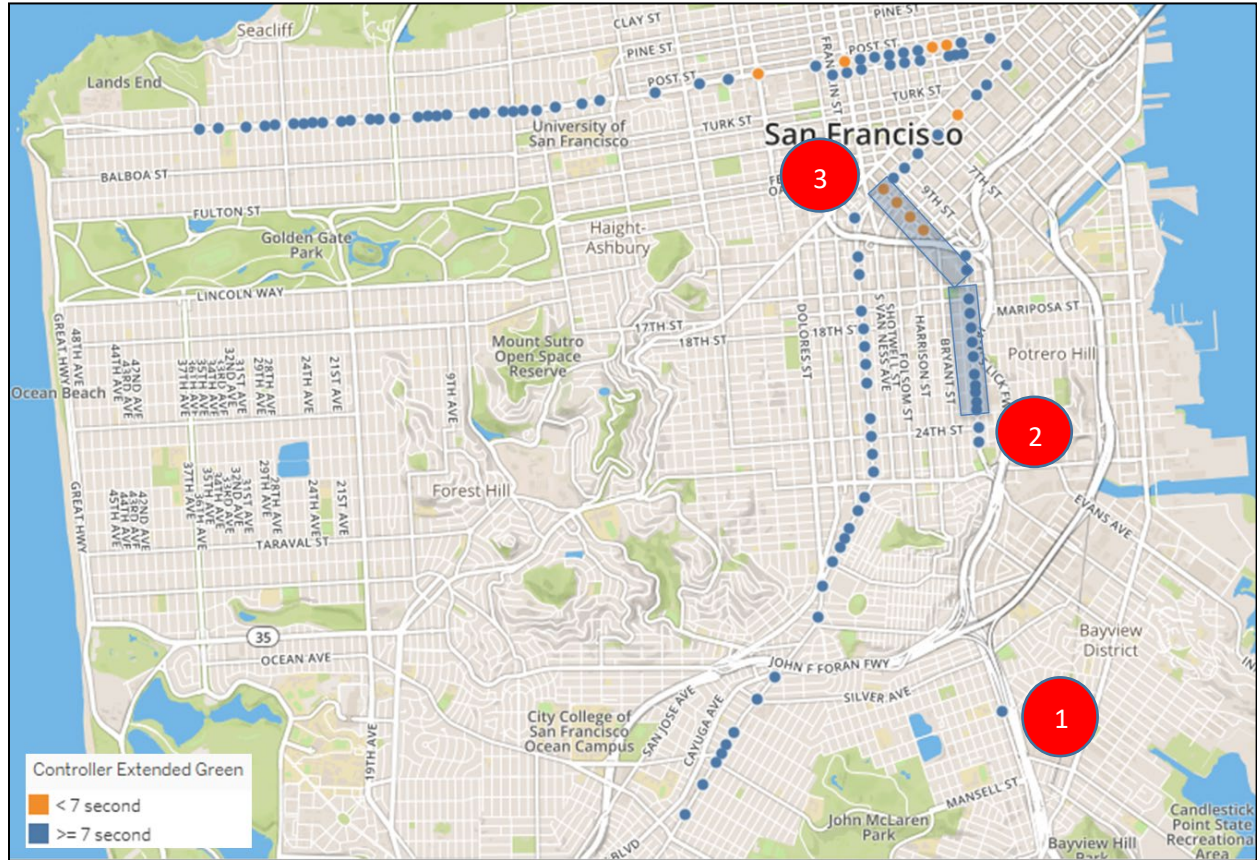
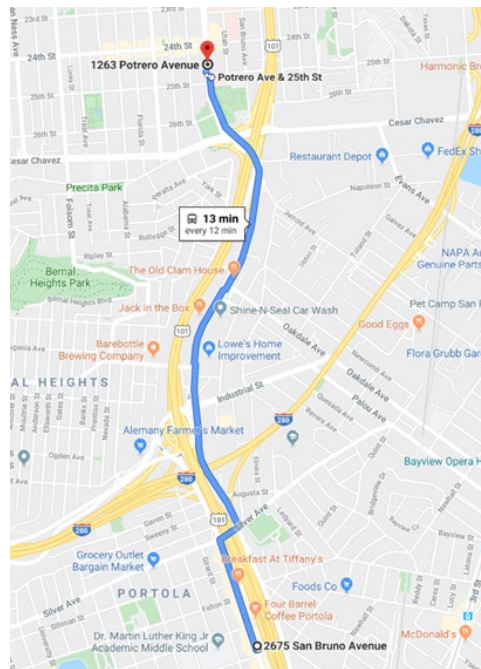


Figure 8-4 Map and time of the segment between the first and second stops on the 9/9R inbound



San Francisco County Transportation Authority

Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Mission and Geneva Pavement Reconstruction
Grant Recipient:	Department of Public Works

EXPENDITURE PLAN INFORMATION

PROP K Expenditure Plans	Street Resurfacing, Rehab, & Maintenance
Current PROP K Request:	\$1,093,827
PROP AA Expenditure Plans	Prop AA Streets Projects
Current PROP AA Request:	\$4,794,258
Supervisory Districts	District 08, District 09, District 11

REQUEST

Brief Project Description

In coordination with SFMTA's Mission/Geneva Safety Project. Demolition, pavement renovation of 55 blocks, new sidewalk construction, curb ramp construction and retrofit, traffic control, and all related and incidental work along Geneva Ave from Mission St to Prague St and Mission St from I-280 to Geneva Ave. The average Pavement Condition Index (PCI) score within the project limits is mid 40's.

Detailed Scope, Project Benefits and Community Outreach

San Francisco Public Works' Street Resurfacing Program is joining SFMTA's Mission / Geneva Safety project and SFPUC's sewer replacement project to deliver infrastructure upgrades, pedestrian safety, and Muni reliability improvements along Geneva Ave and Mission St in the Excelsior neighborhood.

The overall project goals are to improve safety along the project corridor for people walking and bicycling, eliminate pedestrian and vehicle conflicts, support Vision Zero goals, improve reliability and travel time to the 14, 14R/14X, and 49 bus routes, and improve access via MUNI for local residents to get to work, school, appointments, or shopping.

The requested Prop K and Prop AA grants will fund the paving scope of the project. The scope includes demolition, pavement renovation of 55 blocks, new sidewalk construction, curb ramp construction and retrofit, traffic control, and all related and incidental work along Geneva Ave from Mission St to Prague St and Mission St from Ney St to Geneva Ave. The average Pavement Condition Index (PCI) score within the project limits is mid 40's. Streets with a PCI between 20 and 49 are considered "poor condition" and are quickly deteriorating and would require larger scale repair work if they are not treated soon. The overall project limits along Mission St extend to I-280 as there is non-paving scope between Ney St and I-280.

All candidates shown are subject to substitution and schedule changes pending visual confirmation, utility clearances, and coordination with other agencies.

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San Francisco Public Works (SFPW) surveys each of the City's blocks and assigns a PCI score every two years. The PCI score ranges from a low of 0 to a high of 100. These scores assist SFPW with implementing the pavement management strategy of aiming to preserve streets by applying the right treatment to the right roadway at the right time. Streets are selected based on PCI scores as well as the presence of transit and bicycle routes, street clearance (i.e., coordination with utilities) and geographic equity.

Project Location

On Geneva Ave from Mission St to Prague St. On Mission St from I-280 to Geneva Ave.

Project Phase(s)

Construction (CON)

5YPP/STRATEGIC PLAN INFORMATION

Type of Project in the Prop K 5YPP/Prop AA Strategic Plan?	New Project
Is requested amount greater than the amount programmed in the relevant 5YPP or Strategic Plan?	Greater than Programmed Amount
Prop K 5YPP Amount:	\$1,093,827
Prop AA Strategic Plan Amount:	\$4,794,258

Justification for Necessary Amendment

The recommended allocation is contingent upon approval of the 2021 Prop K Strategic Plan Update and corresponding 5YPP amendments, which is the subject of a prior item on this meeting agenda.

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Mission and Geneva Pavement Reconstruction
Grant Recipient:	Department of Public Works

ENVIRONMENTAL CLEARANCE

Environmental Type:	Categorically Exempt
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PROJECT DELIVERY MILESTONES

Phase	Start		End	
	Quarter	Calendar Year	Quarter	Calendar Year
Planning/Conceptual Engineering (PLAN)			Jul-Aug-Sep	2020
Environmental Studies (PA&ED)				
Right of Way				
Design Engineering (PS&E)	Jan-Feb-Mar	2018	Oct-Nov-Dec	2021
Advertise Construction	Jan-Feb-Mar	2022		
Start Construction (e.g. Award Contract)	Apr-May-Jun	2022		
Operations (OP)				
Open for Use			Jul-Aug-Sep	2025
Project Completion (means last eligible expenditure)			Jul-Aug-Sep	2026

SCHEDULE DETAILS

This project is coordinated with SFMTA's transit and safety improvements (Mission / Geneva Safety Project) and SFPUC sewer rehabilitation and replacement project in the same project area. All 3 scopes are coordinated and will be delivered through the same construction contract.

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San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Mission and Geneva Pavement Reconstruction
Grant Recipient:	Department of Public Works

FUNDING PLAN - FOR CURRENT REQUEST

Fund Source	Planned	Programmed	Allocated	Project Total
EP-134: Street Resurfacing, Rehab, & Maintenance	\$1,093,827	\$0	\$0	\$1,093,827
EP-701: Prop AA Streets Projects	\$2,397,129	\$2,397,129	\$0	\$4,794,258
Gas Tax	\$0	\$1,988,717	\$0	\$1,988,717
Phases In Current Request Total:	\$3,490,956	\$4,385,846	\$0	\$7,876,802

FUNDING PLAN - ENTIRE PROJECT (ALL PHASES)

Fund Source	Planned	Programmed	Allocated	Project Total
PROP AA	\$2,397,129	\$2,397,129	\$0	\$4,794,258
PROP K	\$1,093,827	\$0	\$0	\$1,093,827
Gas Tax	\$0	\$1,988,717	\$0	\$1,988,717
General Fund	\$0	\$0	\$960,000	\$960,000
Funding Plan for Entire Project Total:	\$3,490,956	\$4,385,846	\$960,000	\$8,836,802

COST SUMMARY

Phase	Total Cost	PROP AA - Current Request	PROP K - Current Request	Source of Cost Estimate
Planning/Conceptual Engineering	\$0			
Environmental Studies	\$0			
Right of Way	\$0			
Design Engineering	\$960,000			Actuals and cost to complete
Construction	\$7,876,802	\$4,794,258	\$1,093,827	95% engineer's estimate
Operations	\$0			
Total:	\$8,836,802	\$4,794,258	\$1,093,827	

% Complete of Design:	95.0%
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As of Date:	09/30/2021
Expected Useful Life:	15 Years

E6-58**San Francisco County Transportation Authority****Prop K/Prop AA Allocation Request Form****MAJOR LINE ITEM BUDGET**

SUMMARY BY MAJOR LINE ITEM (BY AGENCY LABOR BY TASK)					
Budget Line Item	Totals	% of contract	SFPW	SFMTA	Contractor
1. Construction Contract					
General Work Items (WI)	\$ 452,792				\$ 452,792
Roadway WI	\$ 4,987,473				\$ 4,987,473
Contaminated Soil And Materials WI	\$ 99,808				\$ 99,808
Subtotal	\$ 5,540,073				
2. Construction Management	\$ 805,916	15%	\$ 805,916		
3. Construction Support	\$ 699,802	13%	\$ 538,869	\$ 160,933	
4. Contingency	\$ 831,011	15%	\$ 831,011		
TOTAL CONSTRUCTION PHASE	\$ 7,876,802		\$ 2,175,795	\$ 160,933	\$ 5,540,073

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Mission and Geneva Pavement Reconstruction
Grant Recipient:	Department of Public Works

SFCTA RECOMMENDATION

Resolution Number:		Resolution Date:	
Total PROP K Requested:	\$1,093,827	Total PROP K Recommended	\$1,093,827
Total PROP AA Requested:	\$4,794,258	Total PROP AA Recommended	\$4,794,258

SGA Project Number:		Name:	Mission and Geneva Pavement Reconstruction
Sponsor:	Department of Public Works	Expiration Date:	09/30/2026
Phase:	Construction	Fundshare:	48.49%

Cash Flow Distribution Schedule by Fiscal Year

Fund Source	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	Total
PROP AA EP-701	\$0	\$883,214	\$2,060,829	\$1,850,215	\$0	\$4,794,258

Deliverables

1. Quarterly progress reports (QPRs) shall include % complete to date, photos of work being performed, improvements completed at each location to date, upcoming project milestones (e.g. ground-breaking, ribbon-cutting), and delivery updates including work performed in the prior quarter, work anticipated to be performed in the upcoming quarter, and any issues that may impact delivery, in addition to all other requirements described in the Standard Grant Agreement.

2. With the first QPR (due January 2022) SFPW shall provide 2-3 photos of typical before conditions; with the first quarterly report following initiation of fieldwork Sponsor shall provide a photo documenting compliance with the Prop K attribution requirements as described in the SGA; and on completion of the project Sponsor shall provide 2-3 photos of completed work.

Special Conditions

1. The recommended allocation is contingent upon approval of the 2021 Prop K Strategic Plan Update and corresponding 5YPP amendments, which is the subject of a prior item on this meeting agenda.

2. The Transportation Authority will not reimburse SFPW for the construction phase until Transportation Authority staff releases the funds (\$4,794,258) pending receipt of evidence of completion of design (e.g. copy of certifications page).

SGA Project Number:		Name:	Mission and Geneva Pavement Reconstruction
Sponsor:	Department of Public Works	Expiration Date:	09/30/2026
Phase:	Construction	Fundshare:	11.06%

Cash Flow Distribution Schedule by Fiscal Year

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Fund Source	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	Total
PROP K EP-134	\$0	\$0	\$0	\$210,615	\$883,212	\$1,093,827

Deliverables

1. Quarterly progress reports (QPRs) shall include % complete to date, photos of work being performed, improvements completed at each location to date, upcoming project milestones (e.g. ground-breaking, ribbon-cutting), and delivery updates including work performed in the prior quarter, work anticipated to be performed in the upcoming quarter, and any issues that may impact delivery, in addition to all other requirements described in the Standard Grant Agreement.

2. With the first QPR (due January 2022) SFPW shall provide 2-3 photos of typical before conditions; with the first quarterly report following initiation of fieldwork Sponsor shall provide a photo documenting compliance with the Prop K attribution requirements as described in the SGA; and on completion of the project Sponsor shall provide 2-3 photos of completed work.

Special Conditions

1. The recommended allocation is contingent upon approval of the 2021 Prop K Strategic Plan Update and corresponding 5YPP amendments, which is the subject of a prior item on this meeting agenda.

2. The Transportation Authority will not reimburse SFPW for the construction phase until Transportation Authority staff releases the funds (\$1,093,827) pending receipt of evidence of completion of design (e.g. copy of certifications page).

Metric	PROP K	TNC TAX	PROP AA
Actual Leveraging - Current Request	86.11%	No TNC TAX	39.13%
Actual Leveraging - This Project	87.62%	No TNC TAX	45.75%

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Mission and Geneva Pavement Reconstruction
Grant Recipient:	Department of Public Works

EXPENDITURE PLAN SUMMARY

Current PROP K Request:	\$1,093,827
Current PROP AA Request:	\$4,794,258

- 1) The requested sales tax and/or vehicle registration fee revenues will be used to supplement and under no circumstance replace existing local revenues used for transportation purposes.

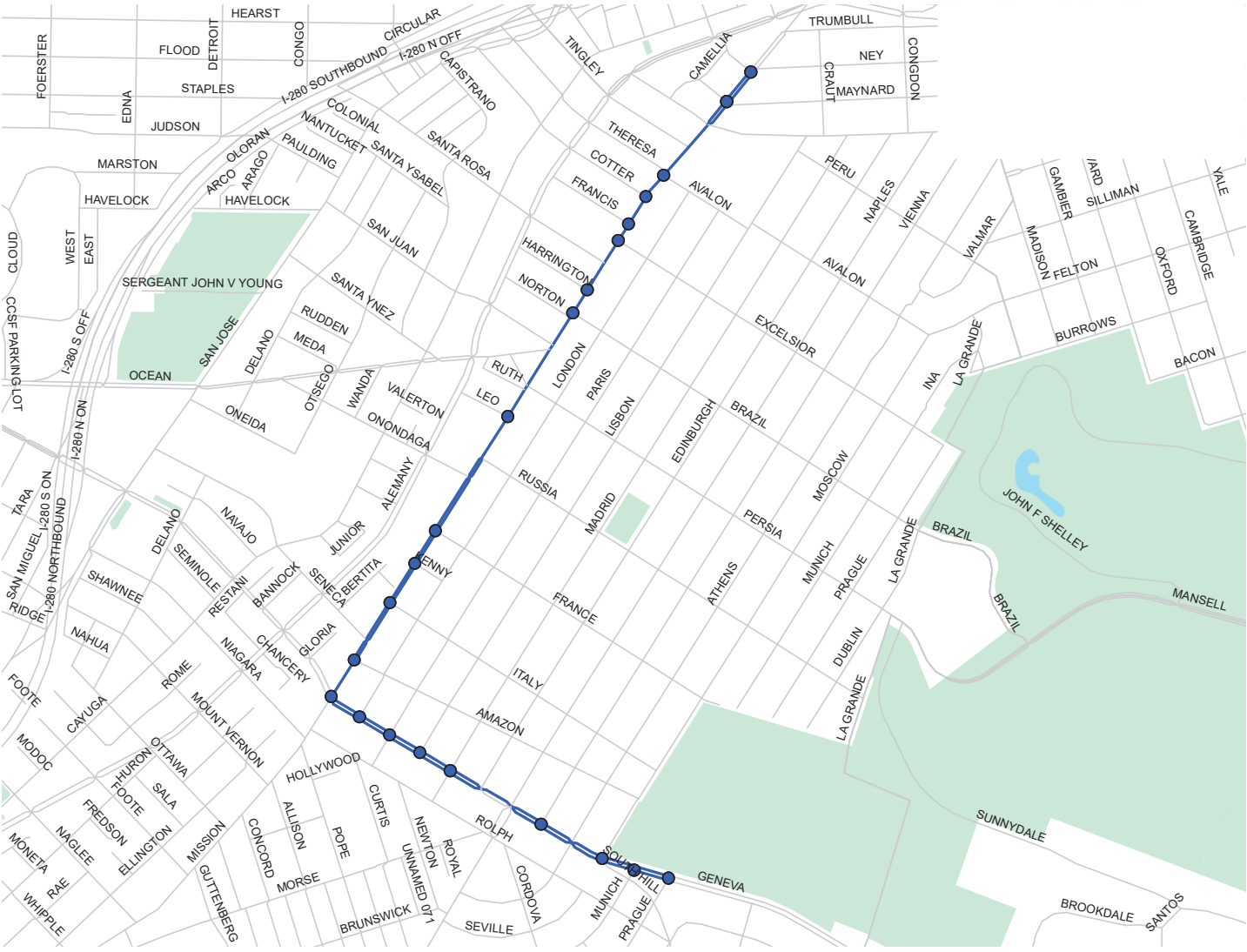
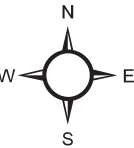
Initials of sponsor staff member verifying the above statement:

OQ

CONTACT INFORMATION

	Project Manager	Grants Manager
Name:	Paul Barradas	Oscar Quintanilla
Title:	Project Manager	Capital Budget Analyst
Phone:	(415) 554-8249	(415) 860-2054
Email:	paul.barradas@sfdpw.org	oscar.quintanilla@sfdpw.org

Mission St and Geneva Ave Improvement Project



Legend

- Blocks
- Intersection

INFORMATION AS OF SEPT 2021

NOTES:
- All Public Works Street Resurfacing Program candidates are subject to substitution and schedule changes pending available funding, visual confirmation, utility clearances, and coordination with other agencies and are NOT guaranteed to be moved forward to construction. Unforeseen challenges such as increased work scope, changing priorities, cost increases or declining revenue may arise causing the Public Works Street Resurfacing Program candidates to be postponed or dropped from consideration.



San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Mission / Geneva Safety Project
Grant Recipient:	San Francisco Municipal Transportation Agency

EXPENDITURE PLAN INFORMATION

PROP K Expenditure Plans	Pedestrian Circulation/Safety
Current PROP K Request:	\$1,391,000
Supervisory District	District 11

REQUEST

Brief Project Description

Pedestrian safety, transit reliability, and loading improvements on Mission Street between Geneva Avenue and the I-280 freeway overpass and on Geneva Avenue between Mission and Prague Streets. The project will 1) provide safer, more comfortable walking and biking environments on Mission and Geneva; 2) provide a safer, more predictable driving environment on Mission and Geneva; and 3) improve transit reliability on Mission and Geneva. Scope includes bulb-outs, traffic signals, new pedestrian crossings, transit bulbs, transit stop improvements and changes, and loading and color curb management.

Detailed Scope, Project Benefits and Community Outreach

Mission Street and Geneva Avenue are part of San Francisco's Vision Zero High Injury Network – the 13% of city streets where 75% of the severe and fatal collisions occur. Over the last seven years, five community members were killed and at least 323 people were injured in collisions in the project area. Additionally, on some blocks of the project corridor, the eight Muni lines that serve the area have average speeds below 5 mph, pre-COVID. The project will seek to address these issues while making loading improvements to support the over 300 existing storefronts along Mission and Geneva streets.

The project's goals are to:

- Increase safety for all users of the corridor, especially people who walk, bike, and take transit
- Improve transit reliability on the most used bus routes in the neighborhood
- Enhance the business district with loading improvements

From late 2017 to 2018, the project team conducted outreach to better understand the issues and problems that the community faces when using Mission Street and Geneva Avenue, including one-on-one meetings, door-to-door loading surveys, participation in four Excelsior and Outer Mission Neighborhood Strategy meetings, and neighborhood walk-throughs. In late 2018 and early 2019, SFMTA hosted a series of workshops with project stakeholders to refine the conceptual plan to better reflect the community's needs. In April 2019, the project team hosted two open houses to present the refined designs to the wider community and collected feedback that was used to create the final proposal. The project proposal was revised and approved by the SFMTA Board of Directors in

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September 2019.

'Quick-build' improvements – including 'painted safety zones' to improve visibility at corners, curb management enhancements, and transit stop changes – were constructed in summer 2020.

The detailed design phase of the project is nearing 100% completion (expected Nov 2021). The Board approved \$1 million in Prop K funds for design in April 2020 and subsequently added \$351,126 in Prop K funds to fully fund the design phase in February 2021.

This allocation request is for \$1,391,000 in Prop K funds for the construction phase of the project. The project was awarded a 2020 SB1 Local Partnership Program grant of \$8.7 million for construction by the California Transportation Commission, to be matched dollar-for-dollar with local funds.

Project scope

- 6 new traffic signals
- 4 signal modifications and timing changes along the corridor
- Up to 35 corner bulb-outs, 4 transit bulbs, and 1 transit island
- Visibility daylighting along the corridor
- 3 raised crosswalks
- Adjusted transit stops
- Curb management to support businesses
- Bikeway improvements (on Geneva Ave)

Please see attached design drawings for locations of each of the project scope elements.

Deliverables

1. Implementation of new and modified traffic signals
2. Implementation of bulb-outs, islands, raised crosswalks, and other safety changes
3. Implementation of revised roadway striping and curb management

Project Location

Mission Street between Geneva Avenue and the I-280 freeway overpass; Geneva Avenue between Mission and Prague Streets

Project Phase(s)

Construction (CON)

5YPP/STRATEGIC PLAN INFORMATION

Type of Project in the Prop K 5YPP/Prop AA Strategic Plan?	Named Project
Is requested amount greater than the amount programmed in the relevant 5YPP or Strategic Plan?	Less than or Equal to Programmed Amount
Prop K 5YPP Amount:	\$1,391,000

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Mission / Geneva Safety Project
Grant Recipient:	San Francisco Municipal Transportation Agency

ENVIRONMENTAL CLEARANCE

Environmental Type:	EIR/EIS
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PROJECT DELIVERY MILESTONES

Phase	Start		End	
	Quarter	Calendar Year	Quarter	Calendar Year
Planning/Conceptual Engineering (PLAN)	Jan-Feb-Mar	2017	Jul-Aug-Sep	2019
Environmental Studies (PA&ED)	Jan-Feb-Mar	2017	Jul-Aug-Sep	2019
Right of Way				
Design Engineering (PS&E)	Oct-Nov-Dec	2019	Oct-Nov-Dec	2021
Advertise Construction	Jan-Feb-Mar	2022		
Start Construction (e.g. Award Contract)	Apr-May-Jun	2022		
Operations (OP)				
Open for Use			Jul-Aug-Sep	2025
Project Completion (means last eligible expenditure)			Jul-Aug-Sep	2026

SCHEDULE DETAILS

All improvements (safety, transit, signal upgrades) will be jointly delivered with a repaving contract by Public Works and SFPUC sewer work starting in mid-2022. It is now expected that the full scope of all project elements will be constructed with this contract.

Environmental clearance for SFMTA's Mission / Geneva Safety Project (previously: Mission Street Excelsior Safety Project) was received in Aug 2019 via an abbreviated CEQA checklist for Muni Forward (previously: Transit Effectiveness Project) Improvements (2011-0558E). Environmental clearance for the complete project, including resurfacing by Public Works and utility work by the SFPUC, was subsequently received in Jul 2021 (2021-003066ENV).

E6-66

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Mission / Geneva Safety Project
Grant Recipient:	San Francisco Municipal Transportation Agency

FUNDING PLAN - FOR CURRENT REQUEST

Fund Source	Planned	Programmed	Allocated	Project Total
EP-140: Pedestrian Circulation/Safety	\$0	\$1,391,000	\$0	\$1,391,000
AHSC FY21	\$0	\$0	\$582,903	\$582,903
General Fund Pop Base Streets	\$0	\$5,792,886	\$1,000,000	\$6,792,886
SB1 LPP Competitive Funds	\$0	\$8,700,000	\$0	\$8,700,000
Phases In Current Request Total:	\$0	\$15,883,886	\$1,582,903	\$17,466,789

FUNDING PLAN - ENTIRE PROJECT (ALL PHASES)

Fund Source	Planned	Programmed	Allocated	Project Total
PROP K	\$0	\$1,391,000	\$1,351,126	\$2,742,126
AHSC FY21	\$0	\$0	\$582,903	\$582,903
General Fund Pop Base Streets	\$0	\$5,792,886	\$2,650,000	\$8,442,886
IPIC Balboa Park FY17	\$0	\$0	\$84,000	\$84,000
SB1 LPP Competitive Funds	\$0	\$8,700,000	\$0	\$8,700,000
TSIP FY15	\$0	\$0	\$109,000	\$109,000
Funding Plan for Entire Project Total:	\$0	\$15,883,886	\$4,777,029	\$20,660,915

COST SUMMARY

Phase	Total Cost	PROP K - Current Request	Source of Cost Estimate
Planning/Conceptual Engineering	\$347,000		SFMTA - actuals
Environmental Studies	\$0		
Right of Way	\$0		
Design Engineering	\$2,847,126		SFMTA - expected to completion
Construction	\$17,466,789	\$1,391,000	SFMTA/Public Works current estimate at 95% design
Operations	\$0		

Phase	Total Cost	PROP K - Current Request	Source of Cost Estimate
Total:	\$20,660,915	\$1,391,000	

% Complete of Design:	95.0%
As of Date:	09/09/2021
Expected Useful Life:	20 Years

E6-68

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Mission / Geneva Safety Project
Grant Recipient:	San Francisco Municipal Transportation Agency

SFCTA RECOMMENDATION

Resolution Number:		Resolution Date:	
Total PROP K Requested:	\$1,391,000	Total PROP K Recommended	\$1,391,000

SGA Project Number:		Name:	Mission / Geneva Safety Project
Sponsor:	San Francisco Municipal Transportation Agency	Expiration Date:	06/30/2026
Phase:	Construction	Fundshare:	7.96%

Cash Flow Distribution Schedule by Fiscal Year

Fund Source	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	Total
PROP K EP-140	\$0	\$0	\$0	\$1,391,000	\$0	\$1,391,000

Deliverables

- Quarterly progress reports (QPRs) shall include % complete to date, photos of work being performed, upcoming project milestones (e.g. ground-breaking, signal activations, ribbon-cutting), and delivery updates including work performed in the prior quarter, work anticipated to be performed in the upcoming quarter, and any issues that may impact delivery, in addition to all other requirements described in the Standard Grant Agreement.
- With the first QPR, SFMTA shall provide 2-3 photos of typical before conditions; with the first quarterly report following initiation of fieldwork Sponsor shall provide a photo documenting compliance with the Prop K attribution requirements as described in the SGA; and upon completion, SFMTA shall provide 2-3 photos of completed work.

Special Conditions

- The Transportation Authority will not reimburse expenses for the construction phase activities until Transportation Authority staff has received evidence of completion of design (e.g. copy of certifications page).

Metric	PROP K	TNC TAX	PROP AA
Actual Leveraging - Current Request	92.04%	No TNC TAX	No PROP AA
Actual Leveraging - This Project	86.73%	No TNC TAX	No PROP AA

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Mission / Geneva Safety Project
Grant Recipient:	San Francisco Municipal Transportation Agency

EXPENDITURE PLAN SUMMARY

Current PROP K Request:	\$1,391,000
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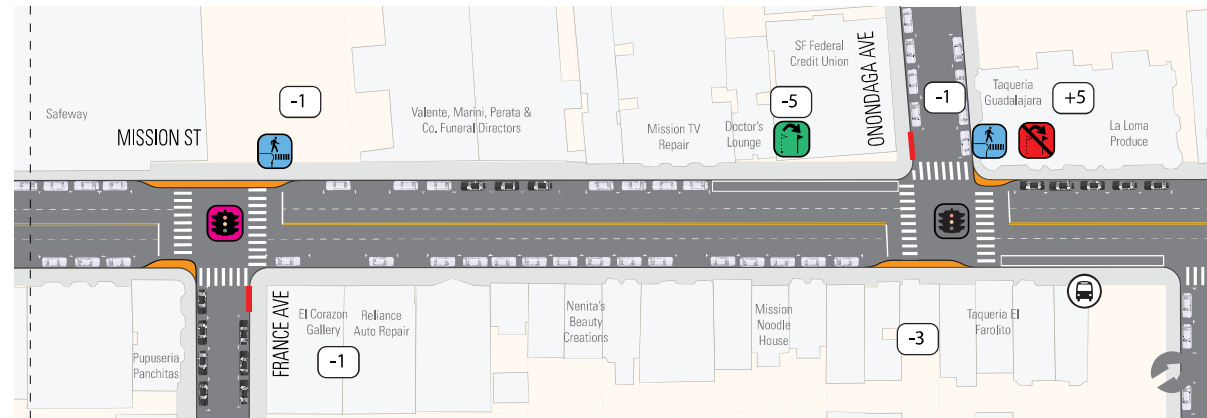
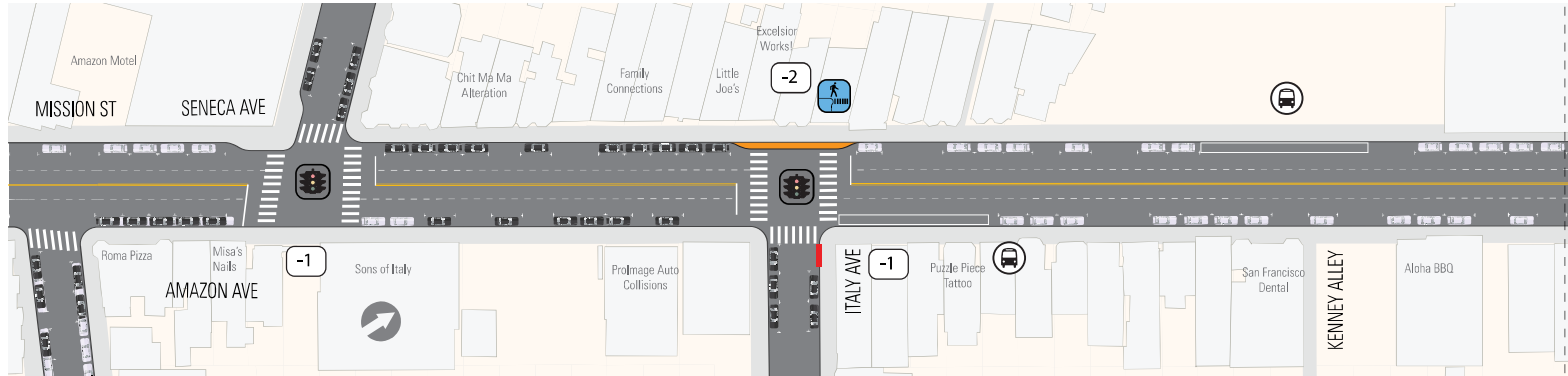
- 1) The requested sales tax and/or vehicle registration fee revenues will be used to supplement and under no circumstance replace existing local revenues used for transportation purposes.

Initials of sponsor staff member verifying the above statement:

MD

CONTACT INFORMATION

	Project Manager	Grants Manager
Name:	Mark Dreger	Joel C Goldberg
Title:	Planner	Grants Procurement Manager
Phone:	(415) 646-2719	(415) 646-2520
Email:	mark.dreger@sfmta.com	joel.goldberg@sfmta.com



Existing Traffic Signals
at Seneca Ave, Italy Ave, and
Onondaga Ave



Existing Stop
at Italy Ave and Onondaga Ave



Daylighting
at Italy Ave, France Ave and
Onondaga Ave



New Traffic Signals
at France (Flashing Beacon
during interim)



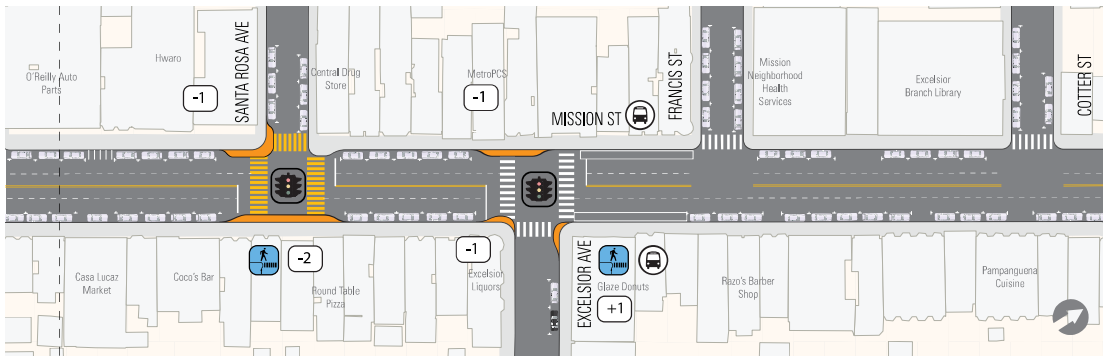
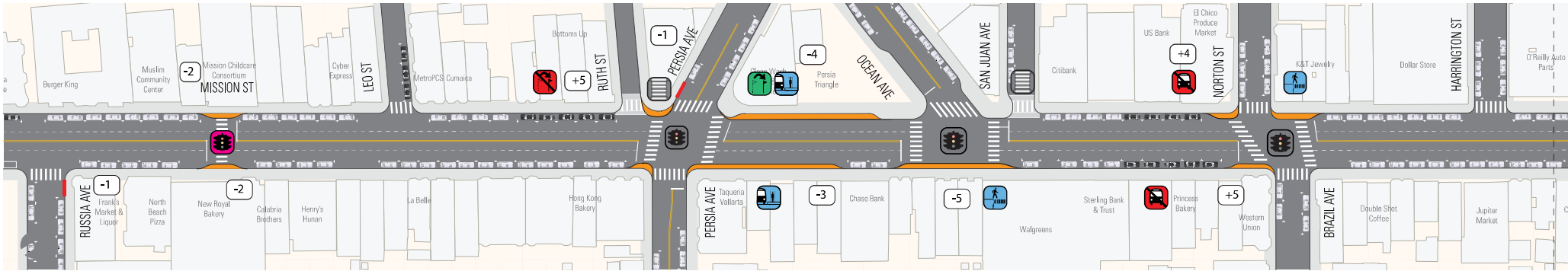
Relocate Stop
at Onondaga Ave



New Pedestrian Bulbs
at Italy St, France Ave, Amazon Ave, and
Onondaga Ave



New Parking Meters



Existing Traffic Signals
at Persia Ave, Ocean Ave, Brazil Ave,
Santa Rosa Ave and Excelsior Ave



New Signalized Crossing
midblock between Russia and Leo



New Pedestrian Bulbs
at Persia Ave, Ocean Ave, Brazil St,
Santa Rosa Ave and Excelsior Ave



Daylighting
at Russia Ave and
Persia Ave



Existing Stop
at Ruth St and Francis St



Remove Outbound Stop
at Norton St & Brazil St (*Option 2*)



New Raised Crosswalk
at Ruth St and San Juan Ave



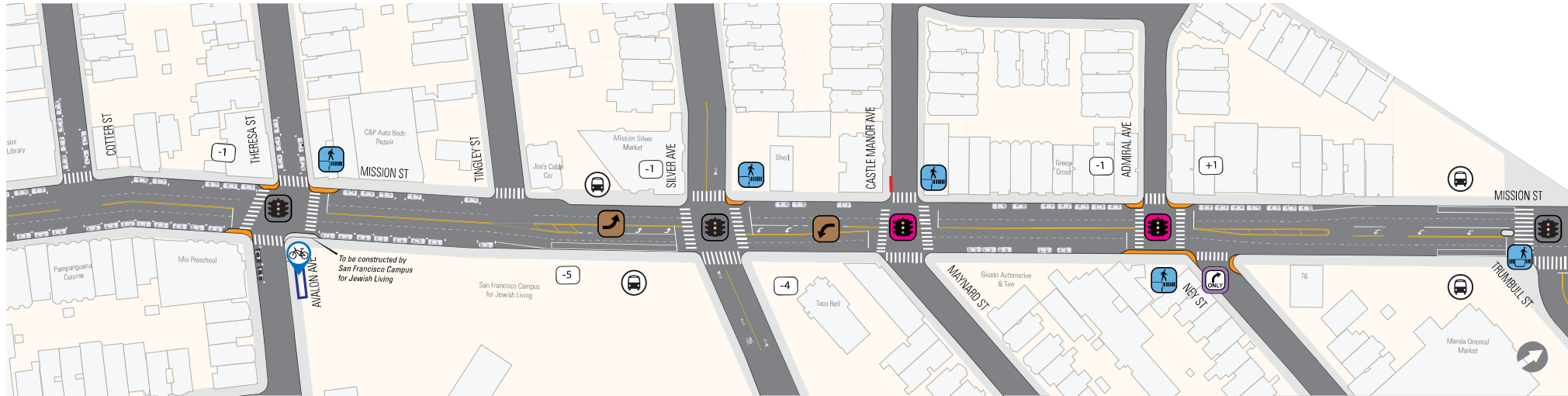
Relocate Stop
at Persia Ave (inbound and
outbound)



New Bus Bulbs
at Ocean Ave and Persia Ave



New Parking Meters



Existing Traffic Signals
at Theresa St, Silver Ave, and
Trumbull St



New Traffic Signals
at Admiral Ave and Castle
Manor Ave/Maynard St



New Parking Meters



Existing Stop
at Silver Ave and Trumbull St



New Left Turn Pocket
on Mission St at Silver Ave



New Median Island at
Trumbull St



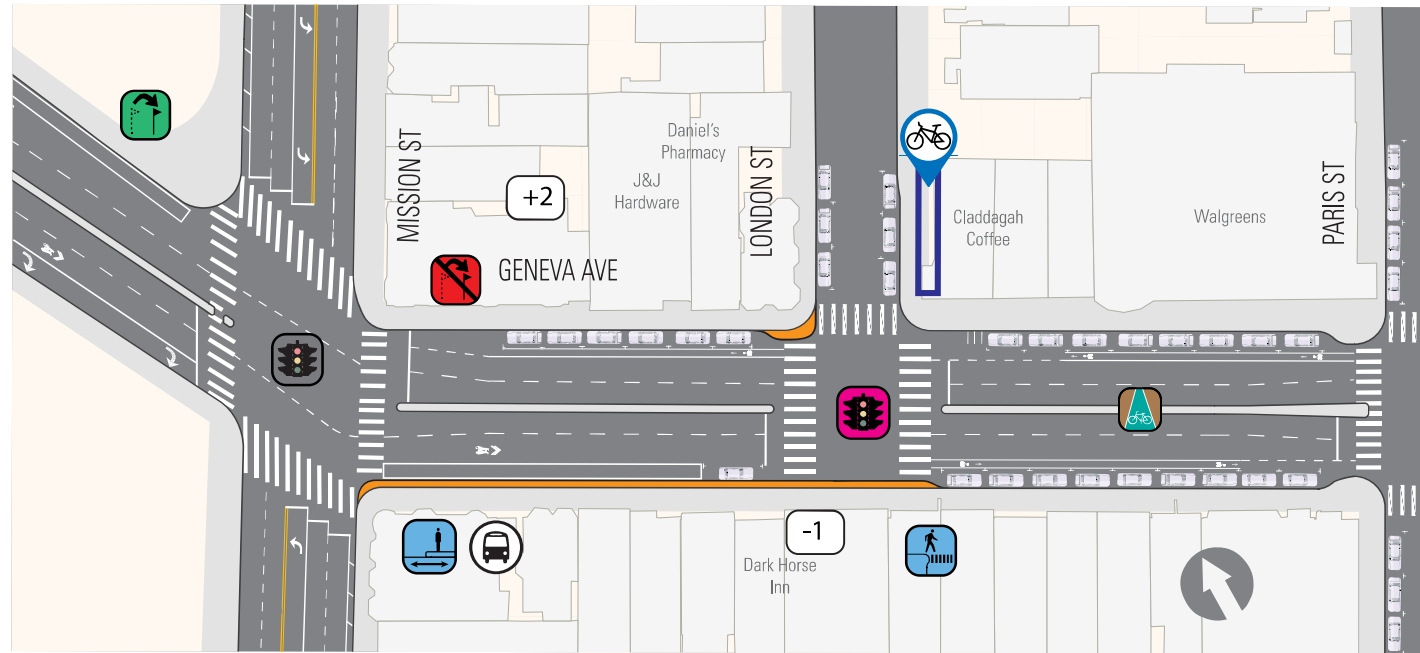
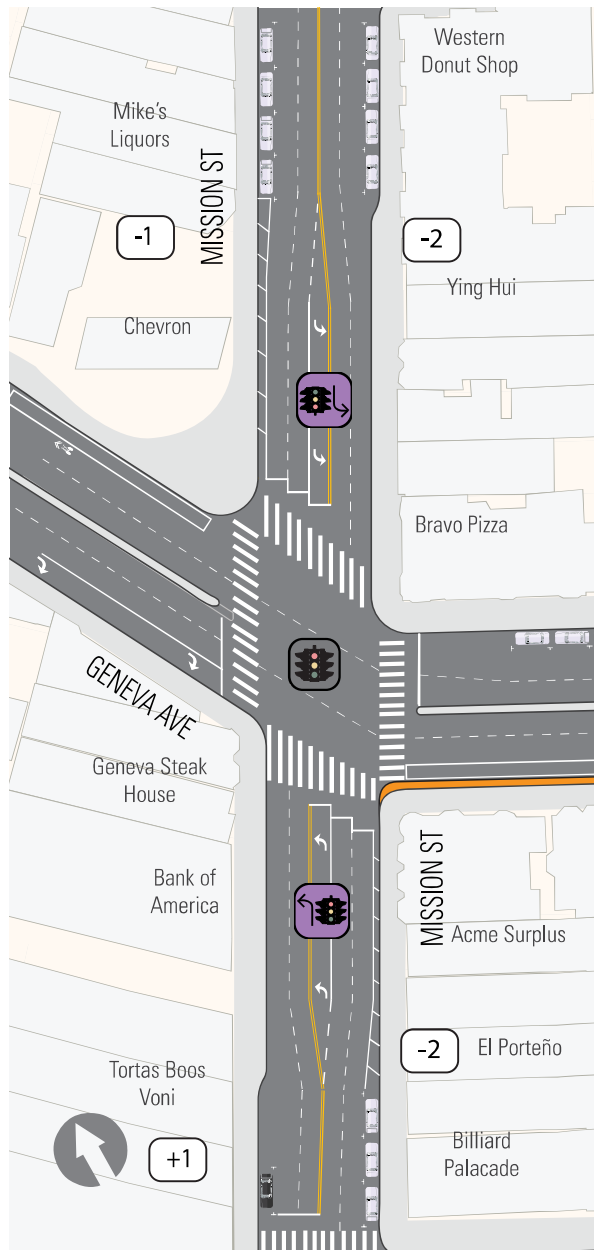
New Pedestrian Bulbs
at Theresa St, Silver Ave, Castle
Manor Ave, and Admiral Ave



Right Turn Only
at Ney Street



Daylighting
at Castle Manor Ave



Existing Traffic Signal
at Mission St



New Traffic Signal at
London St (and remove existing
right-turn only restriction)



Existing Stop
at Mission St



Widen sidewalk (4')
between Mission St and
London St



New Parking Meters



New Left Turn Signals
on north and southbound
Mission St at Geneva Ave



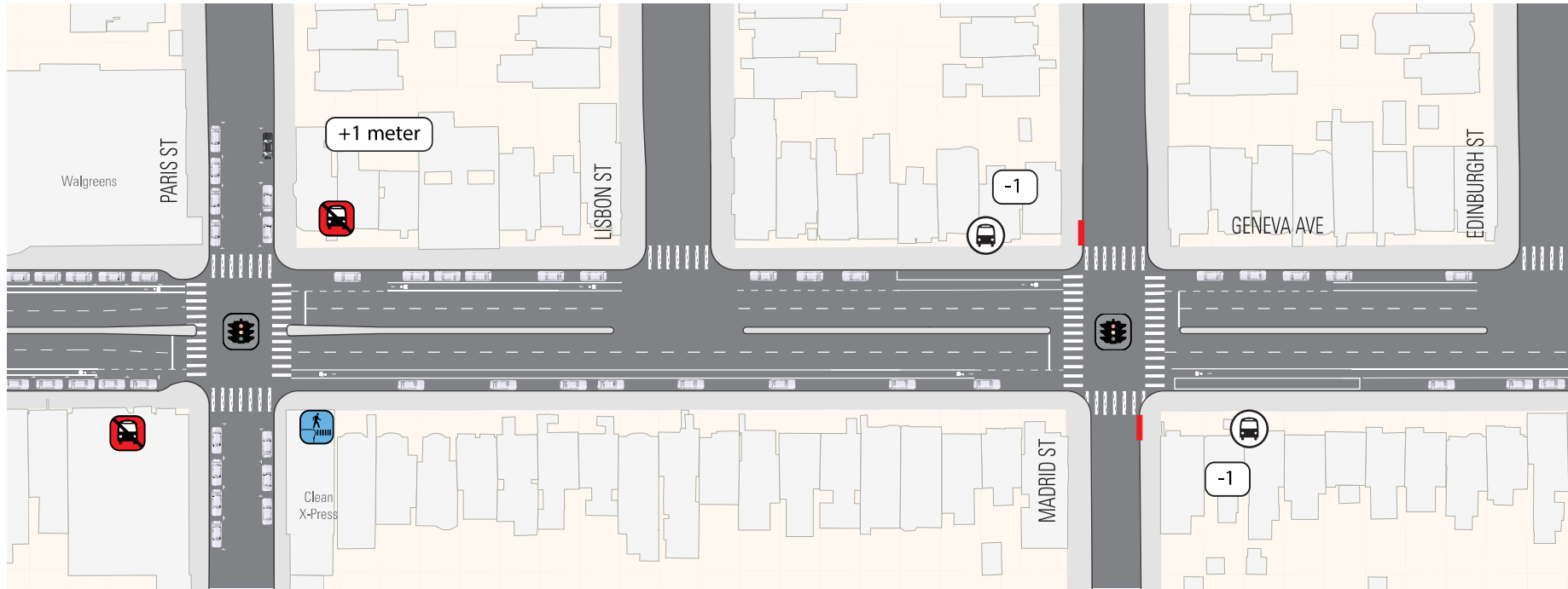
New Bike Lanes
on Geneva Ave from Mission St
to Paris St



Relocate Stop
at Mission Street, westbound



**New Pedestrian
Bulbs** at London St



Existing Traffic Signals
at Paris St and Madrid St



Remove Inbound Stop
at Paris St



Existing Stop
at Madrid St



New Pedestrian Bulbs
at Paris St



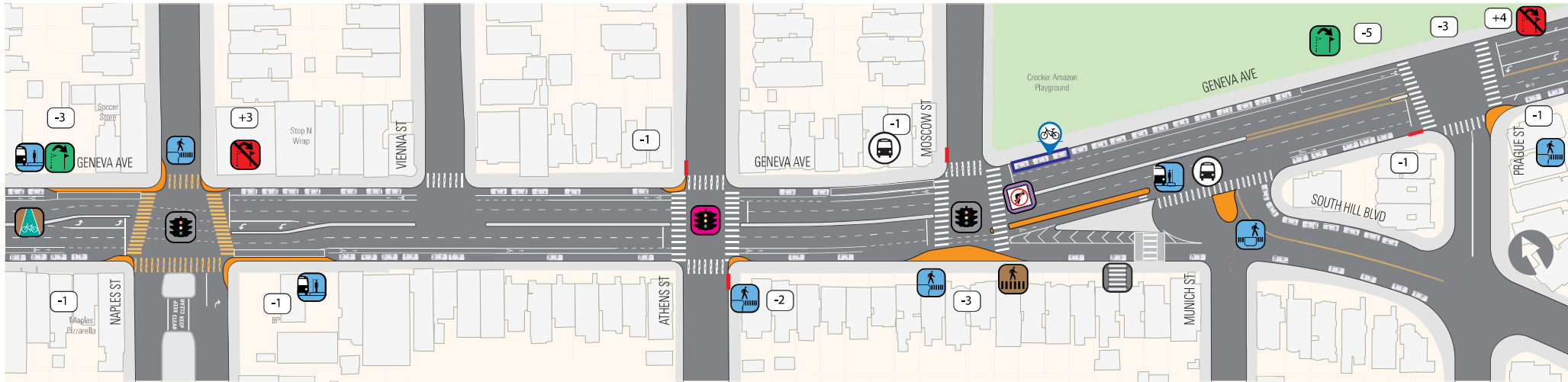
Remove Outbound Stop
at Paris St



New Parking Meters



Daylighting
at Madrid St



Existing Traffic Signals
at Naples St, Moscow St and
Prague St



New Traffic Signal
at Athens St



Daylighting
at Athens St, Moscow St, and Prague St



Relocate Stop
at Naples St and Prague St



New Bus Bulbs
at Naples St



New Bike Lanes
on Geneva Ave from Edinburgh to Vienna St



Existing Stop
at Naples St and South Hill Blvd



New Crosswalk
at Moscow St, east side



New Raised Crosswalk
at Munich St



New Pedestrian Bulbs
at Naples St, Athens St,
Moscow St and Prague St



New Left Turn Restriction
on Geneva Ave at Moscow Street



New Median Island on
South Hill Blvd at Geneva Ave

E6-76

95% PRELIMINARY Engineers Estimate Costshare R1
Mission St Geneva Avenue Improvements

Prepared By: I.LIANG
Date: 09/13/2021

* Note: LS = Lump Sum, EA= Each, LF = Linear Feet, CY= Cubic Yards, SF = Square Feet, AL = Allowance, LBS = Pounds

** Item can vary by more than 25% and/ or deleted in its entirety and no adjustments to the Bid Prices will be made.

*** TBD ITEMS. SUBJECT TO CHANGE

GENERAL ITEMS***					
Bid Item	Bid Item Description	Estimated Quantity	Unit*	Unit Price	Extension
G-1	Temporary Traffic Striping Tape***	10,000	LF	\$ 2.00	\$ 20,000.00
G-2	Mobilization for Paving Work (Maximum 3% of the Sum of Bid Items G-1, R-1 through R-23, Excluding All Allowances)	---	LS	---	\$ 326,202.30
G-3	Demobilization for Paving Work (Maximum 2% of the Sum of Bid Items G-1, R-1 through R-23 Excluding All Allowances)	---	LS	---	\$ 217,468.20
G-4	Allowance for City's Share for Partnering Facilitation and Related Costs***	---	AL	---	\$ 20,000.00
G-5	Allowance for As-Needed Transit Support provided by contractor***	---	AL	---	\$ 300,000.00
G-6	Allowance for As-Needed Overhead Contact System (OCS) Isolation Support provided by the contractor***	---	AL	---	\$ 300,000.00
Sub-total for General Items:					\$1,183,670.50

CONTAMINATED SOILS AND MATERIALS***					
Bid Item	Bid Item Description	Estimated Quantity	Unit*	Unit Price	Extension
CS-1	Transportation Of Surplus California Class I (Non-RCRA) Hazardous Waste (Soils) To A Class I Disposal Facility	450	US SHORT TON	\$ 80.00	\$ 36,000.00
CS-2	Disposal Of Surplus California Class I (Non-RCRA) Hazardous Waste (Soils) To A Class I Disposal Facility	450	US SHORT TON	\$ 80.00	\$ 36,000.00
CS-3	Transportation Of Surplus Non-Hazardous Soils (Class II & III) California Designated Waste (Soils) To A Class II & III Disposal Facility	450	US SHORT TON	\$ 40.00	\$ 18,000.00
CS-4	Disposal Of Surplus Non-Hazardous Soils (Class II & III) California Designated Waste (Soils) To A Class II & III Disposal Facility	450	US SHORT TON	\$ 40.00	\$ 18,000.00
CS-5	Allowance For Unforeseen Environmental Work	---	AL	---	\$ 150,000.00
CS-6	Contingency Allowance For Hazardous Materials Abatement	---	AL	---	\$ 80,000.00
Sub-total for General Items:					\$338,000.00

SFPW		MTA		PUC	
29.53%	\$ 5,905.82	57.89%	\$ 11,577.52	12.58%	\$ 2,516.67
48.52%	\$ 158,283.46	49.23%	\$ 160,601.66	2.24%	\$ 7,317.18
48.52%	\$ 105,522.31	49.23%	\$ 107,067.77	2.24%	\$ 4,878.12
29.53%	\$ 5,905.82	57.89%	\$ 11,577.52	12.58%	\$ 2,516.67
29.53%	\$ 88,587.23	57.89%	\$ 173,662.76	12.58%	\$ 37,750.00
29.53%	\$ 88,587.23	57.89%	\$ 173,662.76	12.58%	\$ 37,750.00
\$452,791.86		\$638,149.99		\$92,728.65	

SFPW		MTA		PUC	
29.53%	\$ 10,630.47	57.89%	\$ 20,839.53	12.58%	\$ 4,530.00
29.53%	\$ 10,630.47	57.89%	\$ 20,839.53	12.58%	\$ 4,530.00
29.53%	\$ 5,315.23	57.89%	\$ 10,419.77	12.58%	\$ 2,265.00
29.53%	\$ 5,315.23	57.89%	\$ 10,419.77	12.58%	\$ 2,265.00
29.53%	\$ 44,293.62	57.89%	\$ 86,831.38	12.58%	\$ 18,875.00
29.53%	\$ 23,623.26	57.89%	\$ 46,310.07	12.58%	\$ 10,066.67
\$99,808.28		\$195,660.05		\$42,531.67	

95% PRELIMINARY Engineers Estimate Costshare R1
Mission St Geneva Avenue Improvements

ROADWAY WORK AND RELATED ITEMS					
Bid Item	Bid Item Description	Estimated Quantity	Unit*	Unit Price	Extension
R-1	Traffic Routing for Paving Work***	--	LS	--	\$ 300,000.00
R-2	Full Depth Planing Per 2-Inch Depth Of Cut	557,000	SF	\$ 1.00	\$ 557,000.00
R-3	Hot Mix Asphalt (Type A, ½-Inch Maximum With Medium Grading)	8,800	TON	\$ 160.00	\$ 1,408,000.00
R-4	10-Inch Thick Concrete Pavement	1,300	SF	\$ 30.00	\$ 39,000.00
R-5	10-Inch Thick Concrete Base	153,500	SF	\$ 30.00	\$ 4,605,000.00
R-6	10-Inch Thick Concrete Parking Strip or Gutter	7,400	SF	\$ 30.00	\$ 222,000.00
R-7	10-Inch Thick Concrete Pavement For Raised Crosswalks	900	SF	\$ 22.00	\$ 19,800.00
R-8	10-Inch Thick Concrete Bus Pad (6,000 PSI)	18,600	SF	\$ 40.00	\$ 744,000.00
R-9	Aggregate Base Class II For Bus Pad	600	CY	\$ 130.00	\$ 78,000.00
R-10	3-1/2-Inch Thick Concrete Sidewalk	56,000	SF	\$ 20.00	\$ 1,120,000.00
R-11	Combined 6-Inch Wide Concrete Curb & 2-Foot Wide Concrete Gutter	2,700	LF	\$ 70.00	\$ 189,000.00
R-12	4 or 6-Inch Wide Concrete Curb	3,800	LF	\$ 100.00	\$ 380,000.00
R-13	Reset Granite Curb (Contingency Bid Item)	325	LF	\$ 90.00	\$ 29,250.00
R-14	Concrete Curb Ramp w/ Concrete Detectable Surface Tiles	85	EA	\$ 3,560.00	\$ 302,600.00
R-15	Concrete Cast-in-Place Detectable Surface Tiles	200	SF	\$ 70.00	\$ 14,000.00
R-16	Brick Cistern Identification Ring Type II (Per SFDPW Standard Plan 87,179)	2	EA	\$ 15,000.00	\$ 30,000.00
R-17	Pull Box Replacement Type I With Fiberlyte Lid And Bolt Down Screw (Contingency Bid Item)***	84	EA	\$ 440.00	\$ 36,960.00
R-18	Pull Box Replacement Type III With Fiberlyte Lid And Bolt Down Screw (Contingency Bid Item)***	207	EA	\$ 560.00	\$ 115,920.00
R-19	Adjust City-Owned Manhole and Catchbasin Frame And Casting To Grade (Contingency Bid Item)***	74	EA	\$ 300.00	\$ 22,200.00
R-20	Adjust City-Owned Hydrant and Watermain Valve Box Casting Cover To Grade (Contingency Bid Item)*	148	EA	\$ 160.00	\$ 23,680.00
R-21	Temporary Tree Protection	20	EA	\$ 250.00	\$ 5,000.00
R-22	F&I Changeable Message Signs***	2	EA	\$ 6,000.00	\$ 12,000.00
R-23	EXCAVATION AND BACKFILL SUPPORT FOR SAN FRANCISCO WATER DEPARTMENT (SFPD)	1,500	CY	\$ 400.00	\$ 600,000.00
R-24	Allowance To Perform Necessary Work Due To Unforeseen Conditions Related To Roadway Work	--	AL	\$ 20,000.00	\$ 20,000.00
R-25	Allowance For Uniformed Off-Duty San Francisco Police Officers, As Required By The City Representative, Related to Roadway Work*	--	AL	\$ 5,145.00	\$ 5,145.00
					\$10,878,555.00

SFPW		MTA		PUC	
48.52%	\$ 145,569.29	49.23%	\$ 147,701.28	2.24%	\$ 6,729.43
502,300	\$ 502,300.00	48,700	\$ 48,700.00	6,000	\$ 6,000.00
7,900	\$ 1,264,000.00	800	\$ 128,000.00	100	\$ 16,000.00
0	\$ -	1,300	\$ 39,000.00	0	\$ -
91,935	\$ 2,758,050.00	54,865	\$ 1,645,950.00	6,700	\$ 201,000.00
1,900	\$ 57,000.00	5,500	\$ 165,000.00	0	\$ -
0	\$ -	900	\$ 19,800.00	0	\$ -
\$ -	\$ -	18,600	\$ 744,000.00	0	\$ -
0	\$ -	600	\$ 78,000.00	0	\$ -
3,600	\$ 72,000.00	52,400	\$ 1,048,000.00	0	\$ -
400	\$ 28,000.00	2,300	\$ 161,000.00	0	\$ -
500	\$ 50,000.00	3,300	\$ 330,000.00	0	\$ -
45	\$ 4,050.00	280	\$ 25,200.00	\$ -	\$ -
11	\$ 39,160.00	74	\$ 263,440.00	0	\$ -
0	\$ -	200	\$ 14,000.00	0	\$ -
2	\$ 30,000.00	\$ -	\$ -	\$ -	\$ -
3	\$ 1,320.00	81	\$ 35,640.00	0	\$ -
10	\$ 5,600.00	197	\$ 110,320.00	0	\$ -
20	\$ 6,000.00	54	\$ 16,200.00		
40	\$ 6,400.00	108	\$ 17,280.00		
		20	\$ 5,000.00		
48.52%	\$ 5,822.77	49.23%	\$ 5,908.05	2.24%	\$ 269.18
		100.00%	\$ 600,000.00		
48.52%	\$ 9,704.62	49.23%	\$ 9,846.75	2.24%	\$ 448.63
48.52%	\$ 2,496.51	49.23%	\$ 2,533.08	2.24%	\$ 115.41
\$4,987,473.19		\$5,660,519.16		\$230,562.64	

SEWER WORK AND RELATED ITEMS					
Bid Item	Bid Item Description	Estimated Quantity	Unit*	Unit Price	Extension
SW-1	Traffic Routing For Sewer and Drainage Work***	---	LS	---	\$ 125,000.00
SW-2	Trench And Excavation Support Work for Sewer Work and Drainage Work	---	LS	---	\$ 84,510.00
SW-3	Standard Concrete Manhole For 12-Inch To 24-Inch Diameter Sewers With Frame And Cover (Per SFDPW Standard Plan 87,181)	15	EA	\$ 7,000.00	\$ 105,000.00
SW-4	Clean And Mortar Existing Brick or Concrete Manhole	5	EA	\$ 4,000.00	\$ 20,000.00
SW-5	Clean And Televis Existing Main Sewers Prior To Lining Work	---	LS	---	\$ 6,000.00
SW-6	Remove Obstruction Requiring Internal Reaming From Existing Sewer Prior to Lining Work	3	EA	\$ 600.00	\$ 1,800.00
SW-7	Bypassing Main Sewer Flow Related to Lining Work and Mortaring Work	---	LS	---	\$ 16,000.00
SW-8	Bypassing Side Sewer And Culvert Flow Related to Mortaring Work (Contingency Bid Item)*	10	EA	\$ 1,250.00	\$ 12,500.00
SW-9	Bypassing Side Sewer And Culvert Flow Related to Lining Work (Contingency Bid Item)*	18	EA	\$ 500.00	\$ 9,000.00
SW-10	Line Existing 18-Inch Inside Diameter VCP Sewer With Cured-In-Place-Liner (CIPL)	224	LF	\$ 275.00	\$ 61,600.00
SW-11	Internally Reinstate Connections in Newly Lined Main Sewers (Contingency Bid Item)*	13	EA	\$ 450.00	\$ 5,850.00
SW-12	Minimum 1-Inch Thick Layer of CAC Coating System for Existing 3'x4'-6" RC Sewer OR 2'-6"x3'-9" RC Sewer	75	LF	\$ 300.00	\$ 22,500.00
SW-13	8-Inch Diameter VCP Sewer on Crushed Rock Bedding Wrapped in Geotextile Fabric	20	LF	\$ 350.00	\$ 7,000.00
SW-14	12-Inch Diameter VCP Sewer On Crushed Rock Bedding Wrapped in Geotextile Fabric	1,566	LF	\$ 375.00	\$ 587,250.00
SW-15	15-Inch Diameter VCP Sewer On Crushed Rock Bedding Wrapped in Geotextile Fabric	235	LF	\$ 400.00	\$ 94,000.00
SW-16	18-Inch Diameter VCP Sewer On Crushed Rock Bedding Wrapped in Geotextile Fabric	70	LF	\$ 450.00	\$ 31,500.00
SW-17	10-Inch Diameter VCP Culvert (Contingency Bid Item)*	709	LF	\$ 300.00	\$ 212,700.00
SW-18	Plug and Fill Existing Sewer with Slurry Grout (Contingency Bid Item)*	5	CY	\$ 5,000.00	\$ 25,000.00
SW-19	4-Inch or 6-Inch CJP Side Sewer Extension (Contingency Bid Item)*	212	LF	\$ 200.00	\$ 42,400.00
SW-20	Standard Side Sewer Air Vent and Trap Assembly (Per SFDPW Standard Plan 87,196) Including Permits from DBI	34	EA	\$ 3,000.00	\$ 102,000.00
SW-21	Concrete Catch Basin Without Curb Inlet and with New Frame and Grating Per SFDPW Standard Plan 87,188	26	EA	\$ 6,500.00	\$ 169,000.00
SW-22	Concrete Catch Basin With Curb Inlet and with New Frame and Grating Per SFDPW Standard Plan 87,187, And with Horizontal Protection Bar	1	EA	\$ 7,500.00	\$ 7,500.00
SW-23	6-Inch Or 8-Inch Diameter Side Sewer Connection to VCP Main Sewer (Contingency Bid Item)*	49	EA	\$ 350.00	\$ 17,150.00
SW-24	6-Inch Or 8-Inch Diameter VCP Side Sewer Connection to RCP Main Sewer (Contingency Bid Item)*	4	EA	\$ 350.00	\$ 1,400.00
SW-25	Construction Or Replacement of 6-Inch or 8-Inch Diameter Side Sewer Located Within Limits of Main Sewer Work	719	LF	\$ 220.00	\$ 158,180.00

SFPW	MTA	PUC

		\$ 125,000.00

		\$ 84,510.00

		\$ 91,000.00
		\$ 20,000.00
		\$ 6,000.00

		\$ 1,800.00

		\$ 16,000.00

		\$ 12,500.00

		\$ 9,000.00

		\$ 61,600.00

		\$ 5,850.00

		\$ 22,500.00

		\$ 7,000.00

		\$ 582,000.00

		\$ 94,000.00

		\$ 31,500.00
		\$ 67,500.00

		\$ 25,000.00

		\$ 42,400.00

		\$ 102,000.00

		\$ 169,000.00

		\$ 7,500.00

		\$ 17,150.00

		\$ 1,400.00

		\$ 158,180.00

95% PRELIMINARY Engineers Estimate Costshare R1
Mission St Geneva Avenue Improvements

SW-26	Construction Or Replacement of 6-Inch or 8-Inch diameter Side Sewer Located Outside the Limits of Main Sewer Work but Within Contract Limits (Contingency Bid Item)	50	LF	\$ 220.00	\$ 11,000.00
SW-27	Television Inspection of Existing 6-Inch or 8-Inch Diameter Side Sewer and 10-Inch Diameter Culvert Located Within Limits of Main Sewer Work(Contingency Bid Item)*	62	EA	\$ 100.00	\$ 6,200.00
SW-28	Television Inspection of Existing 6-Inch or 8-Inch Diameter Side Sewer and 10-Inch Diameter Culvert Located Outside the Limits of Main Sewer Work but Within Contract Limits (Contingency Bid Item)*	5	EA	\$ 100.00	\$ 500.00
SW-29	Post-Construction Television Inspection Of Newly Constructed And Rehabilitated Main Sewers	2,159	LF	\$ 2.67	\$ 5,764.53
SW-30	Post-Construction Television Inspection of Newly Constructed Side Sewers and Culverts (Contingency Bid Item)	66	EA	\$ 100.00	\$ 6,600.00
SW-31	Cast Iron Water Trap For Existing Catch Basin Including Cleanout Cap Per SFDPW Standard Plan 87.194 (Contingency Bid Item)*	16	EA	\$ 400.00	\$ 6,400.00
SW-32	Reconstruct Pavement Outside Of Sewer T-Trench Limit And Outside of Concrete Base Work Under R-Drawing With 10-Inch Thick Concrete Base Per Excavation Code As Directed by the City Representative (Contingency Bid Item)*	6,638	SF	\$ 20.00	\$ 132,760.00
SW-33	Controlled Density Fill Bedding Material For Water Main and AWSS Facilities Encountered Within The Sewer Trench Prior To Backfill (Contingency Bid Item)*	20	CY	\$ 300.00	\$ 6,000.00
SW-34	Design Of Structural Support For SFWD Facilities Encountered Within Sewer Trench	---	LS	---	\$ 10,000.00
SW-35	AWSS And Water Department Facilities Settlement Reference And Monitoring Points, And Structural Support	---	LS	---	\$ 50,000.00
SW-36	Exploratory Holes or Potholes (Contingency Bid Item)*	30	CY	\$ 500.00	\$ 15,000.00
SW-37	Air Monitoring During CIPL Installation	---	LS	---	\$ 5,000.00
SW-38	Mobilization For Sewer and Drainage Work (Maximum 3% of Sum of Bid Items SW-1 Through SW-37 Above)***	---	LS	---	\$ 65,401.94
SW-39	Demobilization For Sewer and Drainage Work (Maximum 2% of Sum of Bid Items SW-1 Through SW-37 Above)***	---	LS	---	\$ 43,601.29
SW-40	Contingency Allowance To Perform Necessary Work Due To Unforeseen Conditions Related to Sewer Work and Drainage Work	---	AL	---	\$ 60,000.00
Sub-total for Sewer Work:				\$2,349,067.76	

				50	\$ 11,000.00
		36	\$ 3,600.00	26	\$ 2,600.00
				5	\$ 500.00
				2,159	\$ 5,764.53
		25	\$ 2,500.00	41	\$ 4,100.00
				16	\$ 6,400.00
				6,638	\$ 132,760.00
				20	\$ 6,000.00
				---	\$ 10,000.00
				---	\$ 50,000.00
				30	\$ 15,000.00
				---	\$ 5,000.00
				---	\$ 65,401.94
				---	\$ 43,601.29
				---	\$ 60,000.00
		\$0.00	\$516,450.00	\$1,832,617.76	

STRUCTURAL WORK AND RELATED ITEMS					
Bid Item	Bid Item Description	Estimated Quantity	Unit*	Unit Price	Extension
S-1	CAST-IN-DRILLED-HOLE (CIDH) CONCRETE DRILLED PIER CITY STANDARD LIGHT POLE FOUNDATION OUTSIDE OF SUB-SIDEWALK BASEMENT REQUIRING 10 FT DEEP PIER PER 1/ST-2.01	8	EA	\$ 18,333.00	\$ 146,664.00
S-2	CAST-IN-DRILLED-HOLE (CIDH) CONCRETE DRILLED PIER CUSTOM TRAFFIC SIGNAL MAST ARM POLE FOUNDATION OUTSIDE OF SUB-SIDEWALK BASEMENT REQUIRING 16 FT DEEP PIER PER 1/ST-3.03	2	EA	\$ 41,067.00	\$ 82,134.00
S-3	BUS SHELTER MAT SLAB FOUNDATION PER ST-5.01	20	CY	\$ 2,500.00	\$ 50,000.00
Sub-total for Structural Work:				\$ 278,798.00	

SFPW		MTA		PUC	
		100%	\$ 146,664.00		
		100%	\$ 82,134.00		
		100%	\$ 50,000.00		
		\$0.00	\$278,798.00	\$0.00	

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95% PRELIMINARY Engineers Estimate Costshare R1
Mission St Geneva Avenue Improvements

TRAFFIC SIGNAL WORK AND RELATED ITEMS					
Bid Item	Bid Item Description	Estimated Quantity	Unit*	Unit Price	Extension
Vehicle Signal Mountings					
E-1	(3S12") 3-Section, 12-inch Vehicle Signal Face with Type 1 LED Red, Yellow, and Green	102	EA	\$ 1,250.00	\$ 127,500.00
E-2	(3S12"LA) 3-Section, 12-inch Vehicle Signal Face with Type 1 LED Red Left Arrow, Yellow Left Arrow, and Green Left Arrow	4	EA	\$ 1,300.00	\$ 5,200.00
Vehicle Signal Mountings					
E-3	(TV-1-T) One-Way Post Top-Mounted Vehicle Signal Mounting with Terminal Compartment	5	EA	\$ 1,200.00	\$ 6,000.00
E-4	(SV-1-T) One-Way Post Side-Mounted Vehicle Signal Mounting with Terminal Compartment	18	EA	\$ 1,200.00	\$ 21,600.00
E-5	(TV-2-T) Two-Way Post Top-Mounted Vehicle Signal Mounting with Terminal Compartment	3	EA	\$ 1,300.00	\$ 3,900.00
E-6	(SV-2-TA) Two-Way Side-Mounted Vehicle Signal Mounting with Terminal Compartment in Configuration A	27	EA	\$ 1,300.00	\$ 35,100.00
E-7	Signal Back Plate	23	EA	\$ 250.00	\$ 5,750.00
Pedestrian Signals					
E-8	(1S-COUNT Housing) One Section LED Pedestrian Countdown Signal Housing	52	EA	\$ 1,100.00	\$ 57,200.00
E-9	Labor Cost Only to Install City Furnished (1S-COUNT Module) One Section LED Pedestrian Countdown Signal Module	52	EA	\$ 500.00	\$ 26,000.00
Pedestrian Signal Mountings					
E-10	(SP-1) One-Way Post Side-Mounted Pedestrian Signal Mounting	47	EA	\$ 800.00	\$ 37,600.00
E-11	(SP-1)(22"; OR 26"; OR 12"-SF; OR 22"-SF) One-Way Post Side-Mounted Pedestrian Signal Mounting with 22-inch Nipples; or 12-inch Nipples, San Francisco Standard; or 22-inch Nipples, San Francisco Standard	4	EA	\$ 800.00	\$ 3,200.00
E-12	(TP-1) One-Way Post Top-Mounted Pedestrian Signal Mounting	1	EA	\$ 800.00	\$ 800.00
Poles					
E-13	Type 1-A Pole (7 Feet) with Concrete Foundation	1	EA	\$ 3,000.00	\$ 3,000.00
E-14	Type 1-A Pole (10 Feet) with Concrete Foundation	15	EA	\$ 3,000.00	\$ 45,000.00
E-15	Type 1-A Pole (13 Feet) with Concrete Foundation	1	EA	\$ 3,100.00	\$ 3,100.00
E-16	Type 1-A Pole (15 Feet) with Concrete Foundation	1	EA	\$ 3,200.00	\$ 3,200.00
E-17	City Standard Street Light Pole (28.5') with 6' Luminaire Arm, LED Luminaire (See Bid Item S-1 for foundation)	12	EA	\$ 10,000.00	\$ 120,000.00
E-18	Type 16-2-100 Pole with 8-foot Signal Mast Arm, MAC Mounting, and Concrete Foundation	8	EA	\$ 17,000.00	\$ 136,000.00
E-19	Type 17-2-100 Pole with 8-foot Signal Mast Arm, MAC Mounting, 6-foot Luminaire Arm, LED Luminaire, and Concrete Foundation	6	EA	\$ 18,000.00	\$ 108,000.00
E-20	Type 17-3-100 Pole with 20-foot Signal Mast Arm, MAC Mounting, 6-foot Luminaire Arm, LED Luminaire, and Concrete Foundation	1	EA	\$ 18,000.00	\$ 18,000.00
E-21	Type 18-4-100 Pole with Custom 30-foot Signal Mast Arm, MAC Mountings, and Concrete Foundation (See Bid Item S-2 for mast arm)	1	EA	\$ 20,000.00	\$ 20,000.00
E-22	Type 19-4-100 Pole with Custom 30-foot Signal Mast Arm, MAC Mounting, 6-foot Luminaire Arm, LED Luminaire, and Concrete Foundation (See Bid Item S-3 for mast arm)	1	EA	\$ 20,000.00	\$ 20,000.00
E-23	Type 23-3-100 Pole with 35-foot Signal Mast Arm, MAC Mounting(s), and Concrete Foundation	2	EA	\$ 24,000.00	\$ 48,000.00
E-24	Pedestrian Push Button (PPB) Pole, and Concrete Foundation	3	EA	\$ 1,200.00	\$ 3,600.00

SFPW		MTA		PUC	
		100%	\$ 127,500.00		
		100%	\$ 5,200.00		
		100%	\$ 6,000.00		
		100%	\$ 21,600.00		
		100%	\$ 3,900.00		
		100%	\$ 35,100.00		
		100%	\$ 5,750.00		
		100%	\$ 57,200.00		
		100%	\$ 26,000.00		
		100%	\$ 37,600.00		
		100%	\$ 3,200.00		
		100%	\$ 800.00		
		100%	\$ 3,000.00		
		100%	\$ 45,000.00		
		100%	\$ 3,100.00		
		100%	\$ 3,200.00		
		100%	\$ 120,000.00		
		100%	\$ 136,000.00		
		100%	\$ 108,000.00		
		100%	\$ 18,000.00		
		100%	\$ 20,000.00		
		100%	\$ 20,000.00		
		100%	\$ 48,000.00		
		100%	\$ 3,600.00		

95% PRELIMINARY Engineers Estimate Costshare R1
Mission St Geneva Avenue Improvements

E-25	Guard Posts (Bollards)	4	EA	\$ 2,000.00	\$ 8,000.00
E-26	Replace Existing Streetlight Fixture With New Streetlight Fixture	2	EA	\$ 1,000.00	\$ 2,000.00
Pull Boxes					
E-27	Pull Box Type I (Streetlighting)	32	EA	\$ 850.00	\$ 27,200.00
E-28	Pull Box Type III	62	EA	\$ 1,100.00	\$ 68,200.00
E-29	Pull Box Type 36X	11	EA	\$ 1,400.00	\$ 15,400.00
E-30	Pull Box Type 48X	5	EA	\$ 2,750.00	\$ 13,750.00
Conduits					
E-31	1-1" PVC Schedule 80 Conduit (Underground) in Sidewalk	58	LF	\$ 100.00	\$ 5,760.00
E-32	1-2" PVC Schedule 80 Conduit (Underground) in Sidewalk	1,192	LF	\$ 125.00	\$ 149,025.00
E-33	2-2" PVC Schedule 80 Conduit (Underground) in Same Sidewalk Trench	727	LF	\$ 180.00	\$ 130,878.00
E-34	1-3" PVC Schedule 80 Conduit (Underground) in Sidewalk	119	LF	\$ 130.00	\$ 15,431.00
E-35	1-3" and 1-2" PVC Schedule 80 Conduit (Underground) in Same Sidewalk Trench	139	LF	\$ 135.00	\$ 18,805.50
E-36	1-3" and 2-2" PVC Schedule 80 Conduit (Underground) in Sidewalk	50	LF	\$ 140.00	\$ 7,000.00
E-37	1-2" GRS Conduit (Underground) in Sidewalk	960	LF	\$ 150.00	\$ 144,045.00
E-38	1-2" GRS and 2-2" PVC Schedule 80 Conduit (Underground) in Roadway "T" Trench	855	LF	\$ 190.00	\$ 162,374.00
E-39	1-2" GRS Conduit and 3-2" PVC Schedule 80 Conduit (Underground) in Same Roadway "T" Trench	127	LF	\$ 210.00	\$ 26,565.00
E-40	1-2" GRS and 4-2" PVC Schedule 80 Conduit (Underground) in Roadway "T" Trench	70	LF	\$ 221.00	\$ 15,470.00
E-41	4-2" HDPE Schedule 80 Conduit (Underground) in Same Sidewalk Trench	329	LF	\$ 270.00	\$ 88,830.00
E-42	4-2" HDPE Schedule 80 Conduit (Underground) in Same Roadway "T" Trench	574	LF	\$ 280.00	\$ 160,832.00
E-43	1-1.5" GRS Conduit (External on Pole) Including Condulet, Connectors, And Straps	25	LF	\$ 100.00	\$ 2,500.00
Intersection Controller, Cabinet, and Network					
E-44	Construct Standard "352i-ATC" Traffic Signal Controller Concrete Foundation.	9	EA	\$ 2,500.00	\$ 22,500.00
E-45	Labor Cost Only to Install City-Furnished 2070 Intersection Controller "352i-ATC" Cabinet Assembly	9	EA	\$ 1,875.00	\$ 16,875.00
E-46	12-Conductor Cable	130	LF	\$ 5.00	\$ 650.00
Miscellaneous					
M-1	All wiring work, all miscellaneous electrical work including work to furnish and install ground rods, fuses, pull tape, pole caps, knockout seals, junction boxes, relocatable and adjustable pull boxes, and PG&E distribution boxes	-	LS	\$ 325,000.00	\$ 325,000.00
M-2	Remove and Salvage as City's Property Specified Existing Signal Poles, Streetlight Poles, and Controller Cabinets	-	LS	\$ 71,000.00	\$ 71,000.00
M-3	Remove as Contractor's Property Certain Existing Street Light Poles and Pole Foundations, Pull Boxes, Wires, and Conduits	-	LS	\$ 89,500.00	\$ 89,500.00
M-4	Exploratory Holes or Potholes (Contingency Bid Item)	11	EA	\$ 3,000.00	\$ 33,000.00
M-X	Traffic Routing Work for Traffic Signal Work***	-	LS	-	\$ 450,000.00
M-5	Mobilization (Maximum 5% of the Total Sum of the Bid Items 1 Through M-5)	-	LS	-	\$ 146,417.03
A-1	Allowance for Partnering Requirements	-	AL	-	\$ 8,000.00
A-2	Allowance for Two Uniformed San Francisco Police Officers (SFPD) for Traffic Control, as Required by the Engineer	-	AL	-	\$ 14,000.00
A-3	Allowance for transportation, handling, and disposal of surplus excavated material and unforeseen environmental work	-	AL	-	\$ 70,000.00
Sub-total for Traffic Signal Work:				\$	3,166,757.53

SUB TOTAL CONSTRUCTION COST	\$18,194,848.78
15% Contingency	\$2,729,227.32
Total Construction	\$20,924,076.10

	100%	\$ 8,000.00		
	100%	\$ 2,000.00		
	100%	\$ 27,200.00		
	100%	\$ 68,200.00		
	100%	\$ 15,400.00		
	100%	\$ 13,750.00		
	100%	\$ 5,760.00		
	100%	\$ 149,025.00		
	100%	\$ 130,878.00		
	100%	\$ 15,431.00		
	100%	\$ 18,805.50		
	100%	\$ 7,000.00		
	100%	\$ 144,045.00		
	100%	\$ 162,374.00		
	100%	\$ 26,565.00		
	100%	\$ 15,470.00		
	100%	\$ 88,830.00		
	100%	\$ 160,832.00		
	100%	\$ 2,500.00		
	100%	\$ 22,500.00		
	100%	\$ 16,875.00		
	100%	\$ 650.00		
	100%	\$ 325,000.00		
	100%	\$ 71,000.00		
	100%	\$ 89,500.00		
	100%	\$ 33,000.00		
	100%	\$ 450,000.00		
	100%	\$ 146,417.03		
	100%	\$ 8,000.00		
	100%	\$ 14,000.00		
	100%	\$ 70,000.00		
\$0.00		\$3,166,757.53		\$0.00

\$5,540,073.34	\$10,456,334.72	\$2,198,440.72
\$831,011.00	\$1,568,450.21	\$329,766.11
\$6,371,084.34	\$12,024,784.93	\$2,528,206.83

95% PRELIMINARY Engineers Estimate Costshare R1
Mission St Geneva Avenue Improvements

CITY SOFT COSTS		
DESIGN		
Project Management (AE2)	\$	712,000.00
0-10% Level - ESH Paving (AE2)	\$	\$66,000.00
35-100% Level - Paving (AE2)	\$	993,000.00
Hydraulics - Mission Street (AE2)	\$	138,700.00
Electrical (AE2)	\$	55,293.48
Structural (AE2)	\$	60,713.00
Geotech (AE2)	\$	8,480.00
Regulatory Affairs	\$	4,899.00
Public Affairs - ABE Letters (PA)	\$	698.00
DAC - Mission Street (AEX)	\$	26,000.00
BSM Survey - Mission Street	\$	112,100.00
Contract Prep (ECP/ MCP-CPS)***	\$	14,000.00
SAR***	\$	6,400.00
ESH Bulbout Designs - Geneva Ave (AE2)		\$220,000.00
Hydraulics - Geneva Ave (AE2)	\$	64,700.00
DAC - Geneva Avenue (AEX)	\$	7,500.00
BSM Survey - Geneva Avenue	\$	63,500.00
Design Fee - Total	\$	2,553,983.48
CONSTRUCTION		
Construction Support @ 5% - Paving (AE3)***	\$	909,742.44
Construction Management Support @ 65%, 95%, DRB review	\$	46,427.42
Construction Management Support @ 15% (ECM-AE3)***	\$	2,729,227.32
Hydraulics - Mission Street (AE3)	\$	10,900.00
Hydraulics - Geneva Ave (AE3)	\$	5,400.00
Public Affairs (PA)***	\$	50,000.00
Materials Testing Lab (MTL)***	\$	30,000.00
MTA-Traffic Routing Construction Support (MTA)***	\$	150,000.00
MTA-Traffic Signal Sign Shop Support***	\$	15,000.00
MTA-Permanent Striping (MTA)***	\$	80,000.00
MUNI OCS Support Services (MUNI)***	\$	300,000.00
Survey Monuments (BSM) (\$3,943 ea)***	\$	78,860.00
BSM Sidewalk Legislation Fee (\$3,021 ea)***	\$	96,672.00
General Plan Referral Fee (\$1,798)***	\$	1,798.00
SAR (SAR)	\$	8,200.00
CDD Support & Work Around (CDD)	\$	622,790.88
Construction Support Fee - Total	\$	5,135,018.06
TOTAL		\$28,613,077.64

DPW		MTA		PUC	
\$	192,000.00	\$	520,000.00		
\$	22,000.00	\$	44,000.00		
		\$	993,000.00		
\$	28,000.00	\$	110,700.00		
		\$	55,293.48		
		\$	60,713.00		
\$	4,240.00	\$	4,240.00		
\$	2,449.50	\$	2,449.50		
		\$	698.00		
\$	9,000.00	\$	17,000.00		
\$	23,000.00	\$	89,100.00		
29.53%	\$ 4,134.07	57.89%	\$ 8,104.26	12.58%	\$ 1,761.67
29.53%	\$ 1,889.86	57.89%	\$ 3,704.81	12.58%	\$ 805.33
			\$ 220,000.00		
\$	21,000.00	\$	43,700.00		
		\$	7,500.00		
		\$	63,500.00		
\$	307,713.43	\$	2,243,703.05	\$	2,567.00

DPW		MTA		PUC	
50.00%	\$ 454,871.22	50.00%	\$ 454,871.22		\$ -
29.53%	\$ 13,709.59	57.89%	\$ 26,875.71	12.58%	\$ 5,842.12
29.53%	\$ 805,915.66	57.89%	\$ 1,579,883.85	12.58%	\$ 343,427.81
29.53%	\$ 3,218.67	57.89%	\$ 6,309.75	12.58%	\$ 1,371.58
29.53%	\$ 1,594.57	57.89%	\$ 3,125.93	12.58%	\$ 679.50
29.53%	\$ 14,764.54	57.89%	\$ 28,943.79	12.58%	\$ 6,291.67
29.53%	\$ 8,858.72	57.89%	\$ 17,366.28	12.58%	\$ 3,775.00
29.53%	\$ 44,293.62	57.89%	\$ 86,831.38	12.58%	\$ 18,875.00
29.53%	\$ 4,429.36	57.89%	\$ 8,683.14	12.58%	\$ 1,887.50
29.53%	\$ 23,623.26	57.89%	\$ 46,310.07	12.58%	\$ 10,066.67
29.53%	\$ 88,587.23	57.89%	\$ 173,662.76	12.58%	\$ 37,750.00
50%	\$ 39,430.00	50.00%	\$ 39,430.00		
		100%	\$ 96,672.00		
		100%	\$ 1,798.00		
29.53%	\$ 2,421.38	57.89%	\$ 4,746.78	12.58%	\$ 1,031.83
		100.00%	\$ 622,790.88		
\$	1,505,717.83	\$	3,198,301.54	\$	430,998.69
DPW		MTA		PUC	
\$	\$8,184,515.60	\$	\$17,466,789.52	\$	\$2,961,772.51

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Ocean Avenue Mobility Action Plan [NTIP Planning]
Grant Recipient:	San Francisco County Transportation Authority

EXPENDITURE PLAN INFORMATION

PROP K Expenditure Plans	Transportation/Land Use Coordination
Current PROP K Request:	\$275,000
Supervisory District	District 07

REQUEST

Brief Project Description

At the request of District 7 Commissioner Myrna Melgar, the Transportation Authority is developing the Ocean Avenue Mobility Action Plan to prioritize and identify funding for previously identified transportation improvements, as well as new ideas to address the corridor's key mobility issues. The Action Plan will build on ideas for the Ocean Avenue corridor that have arisen through various past planning processes, but have not advanced to implementation, resulting in frustration stakeholders on the lack of action to improve mobility in the corridor.

Detailed Scope, Project Benefits and Community Outreach

Geographic Bounds

The Task Force will focus on creating an action plan for transportation improvements to the Ocean Avenue Corridor between Junipero Serra Boulevard and San Jose Avenue. This may include ideas within the vicinity of the corridor from Judson Avenue and Havelock Street to the north and Holloway Avenue to the south.

Study Objectives

1. Convene a community-based task force to help advise the Transportation Authority on developing an Action Plan to improve transportation, street safety, and access around the Balboa Station, City College Ocean Campus, and Ocean Avenue corridor in a comprehensive, multi-modal manner.
2. Develop an action plan for multimodal improvements to Ocean Avenue from San Jose Avenue to Junipero Serra Blvd that is built upon plans, designs, and ideas from prior efforts (e.g. Balboa Reservoir CAC, Balboa Station Area Plan CAC).

Task 1 - Project Management

The Transportation Authority will conduct ongoing management of the project, coordination with internal and MTA staff, consultant procurement, and coordination with District 7 Office.

Task 2 - Develop and Manage Task Force

The Transportation Authority will assemble a task force with community representatives of the corridor and develop a task force charter with key objectives and milestones. Staff with the support of a consultant facilitator will conduct five (5) task force meetings (Table 1). A sixth task force meeting has

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been budgeted as optional if consensus on the final Action Plan is not achieved by Meeting #5.

Proposed Task Force Meeting Structure

- Meeting #1: Needs/Study Scoping
 - Review initial scope for task force and study
 - Review existing transportation improvement concepts and past studies
 - Start identifying corridor needs
- Meeting #2: Goals & Objectives
 - Confirm action plan goals & objectives
 - Share draft screening and evaluation framework
 - Continue to co-create additional concepts
- Meeting #3: Project Concepts
 - Review feedback from Round 1 general outreach and how it informed narrowed list
 - Review narrowed draft project concepts list (5-7 concepts) to go to full evaluation
- Meeting # 4: Project Evaluation
 - Review evaluation results
 - Identify 4-5 draft priorities
- Meeting #5: Draft action plan, including funding opportunities
 - Review Round 2 general outreach feedback and refine action plan
 - Review and refine action plan and funding strategy

Deliverables:

- Final task force list
- Task force charter detailing overall objectives, meetings, meeting protocol, and roles of District 7 Office staff, SFCTA staff and consultant(s)
- Meeting materials for each meeting
- Summary meeting notes and action items

Task 3 - Develop Goals, Objectives and Evaluation Framework

The action plan development will be guided by a set of goals and objectives. Transportation Authority staff will develop a draft set of transportation goals and objectives based on past studies. Draft will be shared with the working group and refined to develop a final set of goals and objectives for the action plan.

Based on the draft goals and objectives, SFCTA staff will develop an evaluation framework for the study that will be used to help the task force prioritize investments in the corridor. This framework will include specific metrics or evaluation criteria (both qualitative and quantitative) for each of the goals identified for the study. A draft of the evaluation framework will be presented at Task Force Meeting #2.

It will also include a proposed approach to the evaluation process, which we anticipate will focus on identifying the tradeoffs across the major improvement choices of the action plan. Because of the space constraints and multiple needs in the corridor, we anticipate that the evaluation framework value will help the Task Force and decision makers to narrow down ideas and identify priorities for the action plan.

Deliverables:

- Draft goals and objectives
- Final goals and objectives
- Draft evaluation framework
- Final evaluation framework

Task 4 - Compile and Develop Concepts

Task 4a. Assemble Existing Concept

Transportation Authority staff will assemble transportation improvement concepts identified in past project or current work, including efforts such as:

- SF Planning Ocean and Geneva Corridor Design Plan (2015)
- SFMTA Balboa Park Station Area and Plaza Improvements (2017)
- SFMTA Frida Kahlo/Ocean/Geneva Intersection project (in progress)
- SFCTA Balboa Park Station Area Circulation Improvements (in progress)

The Transportation Authority will document and organize concepts by both corridor location (intersection or extent) and mode. This will also include a summary of key findings, constraints and costs of potential improvements from past efforts.

Transportation Authority staff will review existing concepts to identify potential concept gaps. The task force will identify help confirm gaps and identify potential additional concepts at the Task Force Meeting #1.

Deliverables

- Summary of findings and projects from prior studies
- Graphics and memo summarizing gaps and existing concepts and additional needs

Task 4b. New Concept Development

Transportation Authority staff, with support from consultants and agency partner SFMTA, will develop up to four (4) new concepts, including capital and operating cost estimates. Drafts of concepts will be workshopped with task force members at Task Force Meeting #2.

Deliverables

- Up to 4 additional corridor concepts beyond those identified in current studies, including associated graphics and summary information including estimates of capital and operation costs (or savings) from specific concepts

Task 4c. Compile and Narrow Concept List

Combining the previous and new additional concepts, The Transportation will inventory and categorize the universe of concepts considered for the Action Plan. Transportation Authority will then conduct an initial screening and narrow down the concept list and present this at Task Force Meeting #3.

Deliverables:

- Inventory of full universe of projects considered for Action Plan
- Narrowed down draft concept list (5-7 concepts)

Task 5 - Concept Evaluation and Tradeoff Identification

Using the evaluation framework developed in Task 3, the Transportation Authority will conduct an evaluation of the remaining concepts as well as identify key tradeoffs between concepts of different modes. The draft evaluation will be presented at Task Force Meeting #4.

Deliverables:

- Draft evaluation of concepts
- Final evaluation of concepts including recommendation of 4-5 concept priorities
 - 2 large-scale improvements (e.g. multi-block and/or capital-intensive projects - protected-bike lane on corridor, major change to Ocean/Geneva/Frida Kahlo intersection)
 - 2-3 small-scale improvements (e.g. targeted intersection changes - restriping without curb reconstruction)

Task 6 - Outreach

The Transportation Authority will conduct two rounds of general public outreach to get feedback on the Action Plan. Activities include

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- Round 1 (identify community priorities feedback on existing ideas, & solicit initial ideas)
 - Survey
 - CBO partner to connect with Chinese community
 - Virtual town halls (English, Chinese, merchants)
 - 5 community group meetings
 - in-person walking tour
- Project newsletter updates in between rounds of outreach to report on study progress and Task Force activities.
- Round 2 (report back on draft Action Plan priorities and take remaining feedback)
 - Virtual town halls (English, Chinese, merchants)
 - 5 community group meetings

Both rounds include promotion of activities (e.g. flyering, social media, Chinese media)

Deliverables:

- Public outreach materials
- Public outreach summary

Task 7 - Develop Action Plan

Based on the concept evaluation and initial feedback from the task force, the Transportation Authority will develop a draft action plan. The Transportation Authority will then conduct general public outreach on the draft plan.

Transportation Authority will finalize the action plan based on outreach feedback and include a funding strategy for priority transportation improvement concepts. The final action plan and funding strategy will be presented to at Task Force Meeting #5.

Deliverables:

- Draft action plan
- Final action plan and funding strategy
- Presentation of the final action plan to the CAC and Board for approval.

The Transportation Authority's NTIP is intended to strengthen project pipelines and advance the delivery of community supported neighborhood-scale projects, especially in Communities of Concern and other neighborhoods with high unmet needs.

Project Location

District 7

Project Phase(s)

Planning/Conceptual Engineering (PLAN)

5YPP/STRATEGIC PLAN INFORMATION

Type of Project in the Prop K 5YPP/Prop AA Strategic Plan?	Project Drawn from Placeholder
Is requested amount greater than the amount programmed in the relevant 5YPP or Strategic Plan?	Less than or Equal to Programmed Amount
Prop K 5YPP Amount:	\$598,000

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Ocean Avenue Mobility Action Plan [NTIP Planning]
Grant Recipient:	San Francisco County Transportation Authority

ENVIRONMENTAL CLEARANCE

Environmental Type:	N/A
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PROJECT DELIVERY MILESTONES

Phase	Start		End	
	Quarter	Calendar Year	Quarter	Calendar Year
Planning/Conceptual Engineering (PLAN)	Oct-Nov-Dec	2021	Jan-Feb-Mar	2023
Environmental Studies (PA&ED)				
Right of Way				
Design Engineering (PS&E)				
Advertise Construction				
Start Construction (e.g. Award Contract)				
Operations (OP)				
Open for Use				
Project Completion (means last eligible expenditure)				

SCHEDULE DETAILS

ACTION PLAN TASK FORCE - five (5) meetings planned, tentatively scheduled for

- 1) October 2021
- 2) January 2022
- 3) June 2022
- 4) September 2022
- 5) December 2023

GENERAL PUBLIC OUTREACH will occur in two rounds

Round 1 - February to March 2022 - get feedback on goals/objectives and solicit initial transportation improvement ideas.

Round 2 - September to October 2022 - get feedback on the draft priorities of the action plan.

START/END DATES BY TASK

Task 1 (Project Management) - Ongoing

Task 2 (Task Force Management) - Ongoing - potential task force meetings identified above

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Task 3 (Goals, Objectives and Evaluation Framework) - November 2021 to March 2022

Task 4 (Compile and Develop Concepts)

- Task 4a - November to December 2021

- Task 4b - January to April 2021

- Task 4c - May to June 2022

Task 5 (Concept Evaluation and Tradeoff Identification) - June to September 2022

Task 6 (Outreach) - See above

Task 7 (Develop Action Plan) - September 2022 to January 2023

Present Action Plan to Board for adoption by February 2023

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Ocean Avenue Mobility Action Plan [NTIP Planning]
Grant Recipient:	San Francisco County Transportation Authority

FUNDING PLAN - FOR CURRENT REQUEST

Fund Source	Planned	Programmed	Allocated	Project Total
EP-144: Transportation/Land Use Coordination	\$275,000	\$0	\$0	\$275,000
Phases In Current Request Total:	\$275,000	\$0	\$0	\$275,000

FUNDING PLAN - ENTIRE PROJECT (ALL PHASES)

Fund Source	Planned	Programmed	Allocated	Project Total
PROP K	\$275,000	\$0	\$0	\$275,000
	\$0	\$0	\$0	\$0
SFMTA Community Response Team Fund	\$25,000	\$0	\$0	\$25,000
Funding Plan for Entire Project Total:	\$300,000	\$0	\$0	\$300,000

COST SUMMARY

Phase	Total Cost	PROP K - Current Request	Source of Cost Estimate
Planning/Conceptual Engineering	\$300,000	\$275,000	Similar prior projects
Environmental Studies	\$0		
Right of Way	\$0		
Design Engineering	\$0		
Construction	\$0		
Operations	\$0		
Total:	\$300,000	\$275,000	

% Complete of Design:	N/A
As of Date:	N/A
Expected Useful Life:	N/A

San Francisco County Transportation Authority

Prop K/Prop AA Allocation Request Form

MAJOR LINE ITEM BUDGET

BUDGET SUMMARY

Agency	Task 1 - Project Management	Task 2 - Task Force	Task 3 - Goals, Objectives, Eval Framework	Task 4 - Concept Development	Task 5 - Concept Evaluation	Task 6 - Outreach	Task 7 - Action Plan	Total
SFMTA	\$ -	\$ -	\$ -	\$ 25,000	\$ -	\$ -	\$ -	\$ 25,000
SFCTA	\$ 24,859	\$ 15,646	\$ 19,858	\$ 18,107	\$ 22,043	\$ 42,936	\$ 23,612	\$ 167,061
Consultants	\$ -	\$ 6,000	\$ -	\$ 20,000	\$ -	\$ 32,000	\$ -	\$ 58,000
Contingency	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 49,939
Total	\$ 24,859	\$ 21,646	\$ 19,858	\$ 63,107	\$ 22,043	\$ 74,936		\$ 300,000

* Direct Costs include mailing, reproduction costs room rental fees.

DETAILED LABOR COST ESTIMATE - BY AGENCY

SFMTA	Hours	Base Hourly Rate	Overhead Multiplier	Fully Burdened Hourly Cost	FTE			Total
Engineer/Architect/ Landscape Architect Sr	14	\$ 96.27	2.56	\$ 246.45	0.01			\$ 3,450
Manager III	10	\$ 76.50	2.65	\$ 202.73	0.00			\$ 2,027
Engineer	40	\$ 83.19	2.58	\$ 214.63	0.02			\$ 8,585
Transit Planner III	25	\$ 69.91	2.63	\$ 183.86	0.01			\$ 4,597
Transportation Planner IV	25	\$ 75.76	3.35	\$ 253.80	0.01			\$ 6,345
Total	114.00				0.04			\$ 25,004

SFCTA	Hours	Base Hourly Rate	Overhead Multiplier	Fully Burdened Hourly Cost	FTE			Total
Deputy Director (Planning)	145	\$ 102.47	2.62	\$ 268.47	0			\$ 38,928.35
Senior Transportation Planner (Planning)	365	\$ 61.58	2.62	\$ 161.34	0			\$ 58,888.95
Senior Transportation Planner (Programming)	95	\$ 61.58	2.62	\$ 161.34	0			\$ 15,327.26
Administrative Engineer	15	\$ 60.45	2.62	\$ 158.38	0			\$ 2,375.69
Deputy Director (Comms)	29	\$ 79.53	2.62	\$ 208.37				\$ 6,042.69
Communications Coordinator	154	\$ 49.69	2.62	\$ 130.19				\$ 20,048.92
Principal Transportation Modeler	40	\$ 83.17	2.62	\$ 217.91	0			\$ 8,716.22
Senior Graphic Designer	56	\$ 49.05	2.62	\$ 128.51	0			\$ 7,196.62
Intern	130	\$ 28.00	2.62	\$ 73.36	0			\$ 9,536.80
Total	1029.00				0.00			\$ 167,061

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Ocean Avenue Mobility Action Plan [NTIP Planning]
Grant Recipient:	San Francisco County Transportation Authority

SFCTA RECOMMENDATION

Resolution Number:		Resolution Date:	
Total PROP K Requested:	\$275,000	Total PROP K Recommended	\$275,000

SGA Project Number:		Name:	Ocean Avenue Action Plan [NTIP Planning]
Sponsor:	San Francisco County Transportation Authority	Expiration Date:	09/30/2023
Phase:	Planning/Conceptual Engineering	Fundshare:	100.0%

Cash Flow Distribution Schedule by Fiscal Year

Fund Source	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	Total
PROP K EP-144	\$150,000	\$125,000	\$0	\$0	\$0	\$275,000

Deliverables

1. Monthly progress reports shall include % complete of the funded phase, % complete by task, work performed in the prior quarter, work anticipated to be performed in the upcoming quarter, and any issues that may impact schedule, in addition to all other requirements described in the Standard Grant Agreement.
2. Task 2: Prior to conducting Task Force meetings, provide Final task force list and Task force charter. (Anticipated November 2021)
3. Task 3: Upon completion, provide Final Goals and Objectives, and Final Evaluation Framework. (Anticipated March 2022)
4. Task 4a: Upon completion, provide summary of findings from prior studies and memo summarizing gaps in existing concepts and additional needs (Anticipated December 2021)
5. Task 4b: Upon completion, provide draft corridor concepts, as presented at Task Force Meeting #2, as well as a summary of feedback from the Task Force. (Anticipated January 2022)
6. Task 4c: Upon completion, provide narrowed down list of concepts. (Anticipated June 2022)
7. Task 5: Upon completion, provide Final evaluation of concepts including recommendation of 4-5 concept priorities (September 2022)
8. Task 6: Prior to conducting general public outreach, provide draft Action Plan. (Anticipated September 2022)
9. Task 6: Upon completion of Round 1 Outreach, provide summary of outreach activities and findings. (Anticipated March 2022)
10. Task 6: Upon completion of Round 2 Outreach, provide summary of outreach activities and findings. (Anticipated October 2022)

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11. Task 7: Upon completion of Action Plan, project team shall provide a final report, including photos of existing conditions, task force and public feedback, evaluation results, and study recommendations. Project team shall present the final report to the CAC and Board for approval. (Anticipated January 2023)

Special Conditions

1. This appropriation requires a waiver of Prop K policy to allow retroactive expenditures starting 7/1/2021.

Notes

1. Progress reports will be shared with the Transportation Authority Board.

Metric	PROP K	TNC TAX	PROP AA
Actual Leveraging - Current Request	0.0%	No TNC TAX	No PROP AA
Actual Leveraging - This Project	8.33%	No TNC TAX	No PROP AA

San Francisco County Transportation Authority Allocation Request Form

FY of Allocation Action:	FY2021/22
Project Name:	Ocean Avenue Mobility Action Plan [NTIP Planning]
Grant Recipient:	San Francisco County Transportation Authority

EXPENDITURE PLAN SUMMARY

Current PROP K Request:	\$275,000
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- 1) The requested sales tax and/or vehicle registration fee revenues will be used to supplement and under no circumstance replace existing local revenues used for transportation purposes.

Initials of sponsor staff member verifying the above statement:

CG

CONTACT INFORMATION

	Project Manager	Grants Manager
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