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# 2019 SFMTA 20-Year Capital Needs

An overview of the agency's anticipated capital needs from Fiscal Year 2020 – Fiscal Year 2040.

Anticipated SFMTA Board of Directors Approval:  
**September 2019**



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## SFMTA Capital Planning Process

The San Francisco Municipal Transportation Agency (SFMTA) capital planning process is a multi-step process that identifies long-term needs for capital investment, matches funding to projects, and establishes specific near-term budgets for the agency.

### Long-Term Capital Planning: *The 20-Year Capital Plan*

The SFMTA 20-Year Capital Plan is the first step in the agency's capital planning process. It is a financially-unconstrained assessment of the SFMTA's anticipated capital needs for the next twenty years. In this document, funding is not committed to any specific project. Instead, the agency uses this planning effort as an opportunity to identify all capital investments necessary to reach its strategic goals and objectives and to provide an optimal level of service for the City of San Francisco. These investments include the replacement, renewal, improvement, expansion, or acquisition of capital assets. It does not include costs for ongoing operations related to those assets and infrastructure.

The capital needs outlined in this document are identified through the development of several agency strategies, plans, and programs, as well as staff-identified needs to address potential safety issues and comply with city mandates. Inclusion of a project or program in the 20-Year Capital Plan does not guarantee funding or approval of that capital investment. Gathering these capital needs into one document provides a clear and consistent starting point for projects to secure federal, state, regional, and local funding.

## Near-Term Capital Planning: *5-Year Capital Improvement Program (CIP) & 2-Year Capital Budget*

All projects seeking capital funding must be included in the 20-Year Capital Plan to be eligible for inclusion in the fiscally-constrained 5-year Capital Improvement Program (CIP). Whereas the 20-Year Capital Plan includes all potential capital investments, the 5-year CIP identifies which projects are planned in the next five years, along with projected funding sources, budgets, and timelines for those projects. Once included in the CIP, those investments will not be included in the next cycle of the 20-Year Capital Plan. Both the Capital Plan and 5-year CIP are dynamic documents that may be changed or adjusted as needs arise or conditions change.

The 2-year Capital Budget represents a list of capital projects that have been approved by the SFMTA Board for implementation. The 2-year Capital Budget is largely based on the first two years of the 5-year CIP and must have full funding plans. The 2-year Capital Budget must be approved by the SFMTA Board by April of each even year.

## Cross-Functional Coordination

Given the diverse functions of the SFMTA, the agency established ten capital programs to categorize the capital investments and ensure all needs are addressed. Representatives from each of the ten programs convene regularly at the Transportation Capital Committee to discuss ongoing capital projects and process improvements.

### *Transportation Capital Committee*

The Transportation Capital Committee (TCC) is an internal, cross-divisional, staff-led body responsible for approving, amending, and implementing the 20-Year Capital Plan, the 5-Year CIP, and the 2-year Capital Budget. Representatives of each of the SFMTA's ten capital program areas meet once a month to review and formally confirm the addition of new capital projects to the 20-Year Capital Plan or CIP, as well as discuss any changes to the scope, schedule, and budget of existing projects. Additionally, the TCC administers the agency-wide Project Integration Process to promote intra-agency collaboration between capital programs as capital projects are first defining their scope of work. Through the documentation of these discussions and updates, the TCC ensures transparency into the SFMTA's funding decisions.

### *SFMTA Capital Programs*

The ten capital programs allow for each area of the SFMTA to identify its capital needs, and better coordinate across the agency.

**Communications and Information Technology (IT)** - This program supports the planning, design and implementation of IT infrastructure projects across the city, from Wi-Fi and telephony systems at SFMTA worksites, to the fiber network that provides the internal communication backbone of the Muni Metro system.

**Facility** - This program supports the modernization and expansion of agency facilities to make them safer, more efficient, and able to accommodate both fleet expansion and the planned transition to an all battery-electric fleet.<sup>1</sup> The capital needs identified in this program will also ensure that all SFMTA employees experience a safe, comfortable and optimal working environment.

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<sup>1</sup> On May 15, 2018, the SFMTA Board of Directors approved a resolution supporting the commitment towards an all-electric bus fleet by 2035. This means that the SFMTA will only purchase all-electric buses starting in 2025 to meet the goal for 2035. <https://www.sfmta.com/press-releases/san-francisco-commits-all-electric-bus-fleet-2035>

**Fleet** – This program funds the rehabilitation or replacement of vehicles as they near the end of their useful life, avoiding costly repairs and service interruptions caused by vehicle failures. This program also includes the expansion of the fleet that helps alleviate overcrowding and expand service, as well as procure new vehicles to transition to an all battery-electric fleet.

**Parking** – This program supports the planning, design, rehabilitation, construction, and operation of public parking garages, as well as the street infrastructure and facilities related to public parking.

**Security** – This program identifies funds to plan, design, and implement security initiatives in case of a natural disaster, terrorist attack, or other emergency situation.

**Streets** – This program brings together pedestrian, bicycle, traffic calming, and school-related projects into an integrated list of investments to make city streets safe and enjoyable places to travel for all modes. It also includes investments in infrastructure for regulating the emerging mobility options in the city. The investments identified in this program are consistent with the Vision Zero SF Action Strategy to reach the city's goal of eliminating traffic deaths.

**Taxi** – This program provides funding to plan, design, and implement improvements to the taxi system and to provide a better customer experience for all taxi users.

**Traffic Signals and Signs** – This program provides funding for upgrading, replacing, and constructing new traffic signals and signal infrastructure to improve safety and manage traffic congestion. The investments identified in this program are consistent with the Vision Zero SF Action Strategy to reach the city's goal of eliminating traffic deaths.

**Transit Fixed Guideway** – This program helps maintain, replace, and enhance Muni's fixed guideway systems, including light rail, trolley coach, historic streetcar, and cable car lines. This includes investments in track replacement, maintenance of Muni's overhead wires and substations, and the train control system.

**Transit Optimization and Expansion** – This program of projects improves the reliability and increase the safety and comfort of Muni transit service.

Embedded within these ten specific capital programs, are capital needs related to the SFMTA Accessible Services. Including these needs across existing capital programs allows for the agency to incorporate related investments in all projects as needed.

While the Central Subway is included in the current CIP as an eleventh capital program, it is not included in this update to the 20-Year Capital Plan, as it is fully funded.

# 2019 Update to the 20-Year Capital Plan

After an initial assessment of the 2017 20-Year Capital Plan, the SFMTA's Planning Division and Budget & Analysis staff determined that the purpose, goals, and needs of the capital planning process remains unchanged from the 2017 effort. Therefore, the agency focused staff resources on the assessment and improvement of the capital programs and the investments listed therein for this cycle, rather than a complete overhaul and development of a new capital plan document.

**This memo and capital needs table append the 2017 20-Year Capital Plan document and will inform the development of the 2019 5-Year Capital Improvement Program (CIP).**

## Assessment and Revisions to the 2017 Capital Needs

For this update to the 20-Year Capital Plan, the Capital Program Managers, project managers, and subject matter experts throughout the agency worked with the Planning Division staff to review the investments listed in the 2017 Capital Plan and identify updates as needed. The focus of this work was to improve the transparency and accuracy of the identified capital investments and ensure that they are in line with the agency's goals. Specifically, the capital program managers and their teams: removed capital needs that have been funded, completed or are no longer planned; updated the scope and cost estimates of the investments that have been identified; integrated contingency costs in the revised cost estimates; and added new investments based on agency plans and city mandates.

The list of capital needs by program is included in *2019 Capital Needs Table* at the end of this document. Organized alphabetically by capital program, the list includes a name for each capital investment as well as a description, justification, general implementation timeline, and cost estimate information.

## Community Outreach and Engagement

The capital planning team met with several stakeholders during this process to inform them that the agency was initiating the long-range capital planning effort and give them a broad overview of what to expect from the process. Through these meetings, staff also gained a better understanding of what the agency's stakeholders believed should be included in the 2019 update.

The key takeaways from this series of stakeholder meetings include the following suggestions:

- Proactive bike and pedestrian planning that really gets us to Vision Zero.
- The capital costs associated with agency mode shift goals and associated future necessary Muni service increases.
- Projects and programs that improve the holistic experience of how people walk, wait for, and ride transit in San Francisco.
- Infrastructure investments that allow people with disabilities full access to the city, including redundant elevator access, accessible pedestrian signals (APS), continuous daily paths of travel, paratransit and ramp taxis, universal accessible design, wayfinding, and passenger amenities.

# 2019 Capital Needs Summary

## Updates from the 2017 Capital Plan

The Capital Plan covers the agency's capital needs over the next 20 years based on what we currently know and can reasonably predict. After a comprehensive review of the 2017 20-Year Capital Plan, the capital program managers and subject matter experts across the agency have updated and expanded the list of capital needs.

Key updates include:

- Significantly expanded investments in the Streets Program to achieve our safety goals.
- Investments in the Fleet and Facility Programs to support the transition to an all-battery-electric fleet.
- Revisions to the cost estimates in the Transit Signals & Signs Program to better account for the total cost of the work in San Francisco's complex built environment.
- Investments in the Streets and Facility programs to better regulate emerging mobility.
- Expansion of the needs in the Transit Fixed Guideway Program to maintain the system in a state of good repair.
- Increased investments in the Transit Optimization & Expansion Program that build on current efforts to improve travel time and reliability.

## Summary of 2019 Capital Needs

PROGRAM	2017 Total Capital Needs <i>(constant 2017 dollars, rounded)</i>	Percent of 2017 Capital Needs	2019 Total Capital Needs <i>(constant 2019 dollars, rounded)</i>	Percent of 2019 Capital Needs	Percent Change from 2017
Communications & Information Technology	\$237 M	1.1 %	\$218 M	0.7 %	-8.1 %
Facility	\$3,490 M	15.9 %	\$4,599 M	14.9 %	31.8 %
Fleet	\$4,540 M	20.7 %	\$5,419 M	17.6 %	19.4 %
Parking	\$671 M	3.1 %	\$681 M	2.2 %	1.4 %
Security	\$545 M	2.5 %	\$557 M	1.8 %	2.2 %
Streets	\$2,456 M	11.2 %	\$4,936 M	16.0 %	101.0 %
Taxi	\$65 M	0.3 %	\$65 M	0.2 %	0.1 %
Traffic Signals & Signs	\$576 M	2.6 %	\$1,488 M	4.8 %	158.3 %
Transit Fixed Guideway	\$1,310 M	6.0 %	\$1,755 M	5.7 %	34.0 %
Transit Optimization & Expansion	\$8,046 M	36.7 %	\$11,068 M	36.0 %	37.6 %
<b>Total (all programs)</b>	<b>\$21,937 M</b>		<b>\$30,784 M</b>		

## Major Changes in Capital Needs from 2017 to 2019

Across all capital programs, inflationary growth has raised the cost estimates of most capital needs. In addition to this overall change, most programs saw updates to the scopes of work for specific capital needs and the inclusion of a contingency, which impacted the cost estimates. The major changes in the SFMTA's capital needs from 2017 to 2019 are identified below by Capital Program.

**Details on the specific needs identified for each program can be found in the *2019 20-Year Capital Needs Table*, starting on page 9 of this document.**

### *Communications & Information Technology Capital Program*

The addition of several near-term projects to modernize agency networks, software, and systems will help agency operations be more effective, efficient, and secure.

### *Facility Capital Program*

The scopes of the capital needs outlined in the Facility Program have been further refined since their inclusion in the 2017 Capital Plan. Furthermore, this update to the capital needs includes the investments needed to modernize the agency's facilities so the agency can effectively store, maintain, and charge the new battery-electric buses needed for transit service.

### *Fleet Capital Program*

The investments listed in the Fleet Program will account for planned service expansions and the transition to the all battery-electric bus fleet by 2035.

### *Parking Capital Program*

This update includes the reinstatement of the electric vehicle charging stations into the list of agency capital needs, and an identified investment in cameras to improve the security of off-street parking lots.

### *Security Capital Program*

The key investments in the Security Program remain unchanged from the 2017 Capital Plan, though the cost estimates have been updated.

### *Streets Capital Program*

The investments in the Streets Program have updated cost estimates that reflect the expanded scopes of work needed to meet the city's Vision Zero goals. Also, there has been a slight change to the structure of the program. The traffic calming and school-related capital investments are now combined into one line to better facilitate the funding and implementation of these closely-related street improvements. Additionally, the infrastructure changes related to the effective regulation of the emerging mobility sector have been added to this capital program.

### *Taxi Capital Program*

Several outdated investments were removed from the list of capital needs (e.g. bicycle racks for taxis), and the cost estimates have been updated.

### *Traffic Signals & Signs Capital Program*

While the key investments listed in this program remain generally the same from the 2017 Capital Plan, the cost estimates for each have been updated to more accurately express the total cost of maintaining, upgrading, and installing the traffic signals and signs in San Francisco's complex built environment.

### *Transit Fixed Guideway Capital Program*

This program has been updated to include infrastructure to support the transition to the all battery-electric fleet. It also includes a refined scope of work for the maintenance of rail infrastructure as well as the maintenance of the subway system, including subway trackwork, station infrastructure, investments in lighting, equipment, systems, and structural needs.

### *Transit Optimization & Expansion Capital Program*

The major updates to this program include revisions to the costs of known projects, including the addition of contingency funds if not already incorporated.

## Next Steps

As discussed earlier in the document, this document serves as an update to the 2017 Capital Plan. Over the next two years, the agency's planning staff will coordinate with agency leadership, subject matter experts, agency stakeholders, and the Transportation Capital Committee to assess the current capital planning process and identify any changes necessary to ensure that the agency is identifying and assigning funds to the most critical and effective projects.

Also, in advance of the next long-range capital planning effort, the SFMTA will be working with other city departments and community members to integrate recommendations from the major ongoing citywide planning efforts like Connect SF ([www.connectsf.org](http://www.connectsf.org)), the ongoing climate adaptation studies, and other initiatives that will identify significant, specific projects for inclusion in the next capital planning cycle.

## 2019 20-Year Capital Needs Table

These tables list the agency's capital needs as determined in summer 2019. Organized alphabetically by capital program, the list includes a name for each capital investment as well as a description, justification, implementation timeline, and cost estimate. The cost estimate included in the following tables are in constant 2019 dollars, rounded to the nearest \$100,000.

### Communications & Information Technology Capital Program

CN #	Name	Description	Justification	Timeline	Total Capital Need <i>(constant 2019 dollars, rounded)</i>	Cost Information & Calculation Methodology
CN-CI01	<b>State of Good Repair of Management Info Systems (MIS), Information Technology (IT), and Network Systems</b>	State of good repair of MIS/IT/Network Systems. Provides for the replacement of various existing Communications/Information Technology assets, including SCADA, Bus On-Board Video, and the Incident Management/Tracking system.	Providing for the timely replacement of these systems supports a safe and reliable transit system.	0-20 years	\$171,400,000	Based on a prior assessment of total agency assets and used a Consumer Price Index (CPI) calculator to estimate the total need in 2019.
CN-CI02	<b>On Board Clipper Reader Replacement and Upgrades</b>	Replacement of the existing Clipper readers (approx. 3500 units). Currently the readers are not able to integrate with Radio and only support Clipper. Replacing the existing readers with units that integrate with Radio, support NFC (open payment), QR/Barcodes and are field proven will address future compatibility issues and current equipment performance issues.	The Clipper system is due to be replaced, however the existing equipment was installed in 2007 and has an operating life of 5 years. The current equipment needs to be replaced to address its ongoing performance reliability issues. Replacing the equipment at this juncture will allow for integration with the new Radio system providing single sign on for operators and enable the agency to leverage newer technology as an adjunct to the Clipper system.	0-5 years	\$10,200,000	Based on 2015 assessment of program cost and used a Consumer Price Index (CPI) calculator to estimate the total need in 2019.
CN-CI03	<b>Disaster Recovery/Continuity Plan</b>	Planning and implementation of an IT server site to provide operations in the event of a disaster. This would be approached in two phases, implement and test key systems, then expand the site to support all systems. High Availability is not covered by this site and is already addressed with the agency's existing infrastructure.	The SFMTA currently uses contracted cloud-based services for disaster recovery purposes. SFMTA plans to use specialized consultant to develop Disaster recovery plan in the event of a disaster that renders both of its primary data centers inoperable it would not be able to operate any of its IT systems in any capacity. A Disaster Recovery site is required to enable the operation of key systems in the event of a disaster.	0-5 years	\$2,900,000	Based on approximate estimate of current technology costs.
CN-CI04	<b>Transportation On-Demand Platform / Internet of Things (IoT) Mesh Network Infrastructure</b>	This Capital Need includes a Transportation On-Demand Platform to build transportation applications and services on such as sensor technology, Internet of Things (IoT), and integration with "Smart City" services, as well as a mesh network system to organize and prioritize networking technologies for IoT including Sigfox, WIFI, CAD/AVL, fiber and future standards and protocols.	Without a platform, applications and services are developed in a silo which reduces compatibility and increases ongoing support costs. IoT and intelligent transportation technologies will require a robust network of networking technologies to manage their communications.	5-20 years	\$4,200,000	Based on approximate estimates from vendors and conversations with peer organizations.
CN-CI05	<b>High Volume Cloud-Based Data Integration, Analytics, Reporting and Monitoring Platform</b>	Create a high-volume cloud-based data platform for storing a wide range of high-volume data, applying analytics to this data for use in recommendation engines and reports, managing and monitoring this incoming data in real-time, and migrating this to government cloud services when appropriate.	The SFMTA is managing and receiving large volumes of data. A platform capable of storing, analyzing, reporting, monitoring and delivering data in a speedy manner with minimal maintenance and effort would assist the agency in detecting and fixing issues in expediently to deliver quality service.	0-5 years	\$2,500,000	Estimates based on current hardware costs and approximate labor costs.
CN-CI06	<b>Phase 2 Radio Project – platform consolidation</b>	The first phase of the computer-aided dispatch/automatic vehicle location (CAD/AVL) system, commonly known as the radio system, was completed in Spring 2019. A second phase is needed to consolidate additional vehicle networks. This would utilize the new CAD/AVL system as a unifying technology platform to provide a single network and technology interface on all vehicles. This is important to ensure future technologies onboard vehicles are compatible with one-another, reduce overall network communications costs and deploy future technologies that would utilize communications and networking through the CAD/AVL.	There are currently 11 networks and antennas on vehicles, which limits compatibility and expansion of systems. This will enable to consolidation of systems resulting in cost savings and expansion of future systems will be more cost effective with a single network on vehicles.	0-5 years	\$1,500,000	Estimate based on past similar work.

CN #	Name	Description	Justification	Timeline	Total Capital Need <i>(constant 2019 dollars, rounded)</i>	Cost Information & Calculation Methodology
CN-CI07	<b>Customer Service Platform Project</b>	Integrate all customer touchpoints and support all mobility permits, fare media, etc. ii. Create supporting business flows and digital transactions to support customer service in parking, taxi, commuter shuttle, traffic, transit, bike and pedestrian requests.	This integration is needed to consolidate systems and applications currently supported in multiple platforms and streamline system management.	0-5 years	\$3,000,000	Estimate based on past similar work.
CN-CI08	<b>Citation and Parking Permits Program</b>	Replace current permit system contracted out to Conduent. Three projects include payment plans for citations, residential and other permit parking, and administrative review.	Customization and cost saving from contracting out the system support	0-5 years	\$2,500,000	Estimate based on past similar work.
CN-CI09	<b>Trapeze Program</b>	Implement new Trapeze modules. - Trapeze Timekeeping rules: Construct Improvement to timekeeping rules to comply with new MOU agreement and automate existing Manual activities. -Absence management and workers comp reporting: Develop an interface between worker's comp management and Transit operating management systems to assist department to obtain latest information of actual worker's comp claims. -Sign-in terminal: Install and design Trapeze Ops Sign in terminal allowing Transit to streamline communication to each operator at start of their shift. - Yard management: Improve daily maintenance and operations of transit revenue vehicles.	Application Enhancement based on Transit needs to improve daily operations for transit operators and revenue vehicle management	0-5 years	\$8,000,000	Estimate based on past similar work.
CN-CI10	<b>On-Premise SharePoint Upgrade</b>	Migration from SharePoint 2010 and 2013 to SharePoint 2019	Support for 2010 and 2013 will no longer be supported.	0-5 years	\$1,200,000	Estimate based on past similar work.
CN-CI11	<b>Digital Street Infrastructure Project</b>	Digitize street and right-of-way infrastructure, regulations and assets in a geographic information / infrastructure design system that supports planning, public outreach and implementation of right-of-way improvements. Re-engineer existing planning and change process to allow greater community insight and collaboration. Create data models to facilitate capturing assets and events. Create analytic data models supporting analysis and reporting.	To update existing outdated and insufficient system and support new and ongoing projects in the City's right-of-way.	0-5 years	\$6,000,000	Estimate based on past similar work.
CN-CI12	<b>Project and Fund Management System Replacement</b>	Replace existing CPCS applications with new system that meets the agency's need to support project delivery	Replace current applications with ones that better meet the needs of client and integrate with Peoplesoft	0-5 years	\$500,000	Estimate based on past similar work.
CN-CI13	<b>Network Infrastructure Replacement</b>	Update and replacement of core networking infrastructure to ensure we can deliver the performance and redundancy this agency needs.	Network connectivity is a critical IT service that is essential to SFMTA operations. Our Network core has not been refreshed in many years and a lot of the equipment is approaching end of life. We also need to redesign our network to handle the new demands and to deliver the resiliency this agency must have to support our operations.	0-5 years	\$2,000,000	<ul style="list-style-type: none"> <li>• Phase 1 (Consulting and Design review): \$500,000</li> <li>• Phase 2 (Setup Core switches and validate design): \$1,000,000</li> <li>• Phase 3 (Connect Remote Sites) \$500,000</li> </ul>
CN-CI14	<b>Video Camera Refresh</b>	Replace outdated surveillance infrastructure at various MTA facilities. Over the years various purchases were made to buy security cameras and much of this equipment is past its useful life. This project will be focused on upgrading the oldest equipment in around 15 locations and about 500 cameras.	During our video modernization project, we have identified a list of sites that have very old surveillance equipment. These sites are using predominantly analog cameras and we want to switch them over to modern IP based cameras for better integration and in most cases higher resolution.	0-5 years	\$1,500,000	Estimate based on past similar work.
CN-CI15	<b>Cybersecurity Modernization</b>	Modernization of cybersecurity infrastructure. Cybersecurity threats keep evolving and there is a need to update key infrastructure like our firewalls to keep current.	Cybersecurity threats keep evolving and we need to update key infrastructure like our firewalls to keep current. Part of this project will also include a detailed risk assessment, so we make sure we are investing in the right places to secure critical infrastructure.	0-5 years	\$500,000	Estimate based on past similar work.

**Facility Capital Program**

CN #	Name	Description	Justification	Timeline	Total Capital Need <i>(constant 2019 dollars, rounded)</i>	Cost Information & Calculation Methodology
CN-FC01	<b>SFMTA Facility Safety Improvement Campaign</b>	A series of facility safety improvement projects at all SFMTA facilities, as appropriate. Projects include work like recurring pigeon abatement, safety enhancements, emergency lighting, etc.	These projects improve the safety of the work environment. Investments in safety infrastructure also assist in promoting a culture of safety.	0-20 years	\$200,000,000	Costs of the projects based on the information gathered in the Facilities Condition Assessment.
CN-FC02	<b>SFMTA Facility Fire Life Safety System Improvement Campaign</b>	Implement Fire Safety Improvements at SFMTA Facilities, including new and additional fire protection (sprinklers, alarms, strobes, etc.) to bring buildings into compliance with fire safety regulations.	Remain in compliance with safety regulations.	0-10 years	\$20,000,000	Estimate based on past similar work.
CN-FC03	<b>1201 Mason (Cable Car Barn) Rehabilitation</b>	Rehabilitate core and shell and major building systems and complete full tenant improvement of the Cable Car Barn, including full overhaul of the electrical system. This historic building houses the full cable car maintenance and operations function, including running repair of vehicles, cable and winding machines, and the Cable Car Museum, which is open to the public.	Maintaining existing cable car facility and fixed equipment in a state of good repair will help ensure safe and reliable transit service.	10-20 years	\$182,200,000	Based on needs identified by the agency's State of Good Repair database and staff assessment.
CN-FC04	<b>Operator Convenience Stations Renewal Campaign</b>	Includes major rehabilitation, preservation, and improvement of 25 existing restroom facilities at 6 locations, including Operations Central Control (OCC), subway stations, etc. and construction of new operator restrooms. Most were built between the 1980s and early 2000s. Some are nearing the end of their estimated 33-year lifespan. A few are historic - with very old outside facades and newer interiors (Taraval and Judah are two examples)	This project will improve and enhance employee facilities, leading to healthier working environments.	0-20 years	\$12,500,000	Average cost of each Convenience Station (\$500,000), multiplied by 25 units needed.
CN-FC05	<b>601 25th Street (Muni Metro East) Expansion Project Phase I and Phase II</b>	Expand the Muni Metro Rail Facility into the currently undeveloped 4 acres to the east of the existing yard, for future light rail vehicle storage, and interim bus maintenance and storage use prior to delivery of the expanded light rail vehicle fleet. Project includes site prep, powered gates and fencing, site lighting, public address system, and traction power/overhead catenary systems.	Facilities for transit operations, paratransit, SSD shops, etc. are located on short-term leased property and it is in the strategic interest of SFMTA to secure long-term or permanent locations for these activities. The continued growth of transit results in a similar challenge as SFMTA has a need for long-term or permanent locations for transit operations facilities.	Phase I: 0-5 years Phase II: 10-20 years	\$120,000,000	Based on estimate included in the 2017 Facilities Framework.
CN-FC06	<b>Real Property Acquisition for SFMTA Facilities</b>	Acquisition of real estate property (purchase or long-term lease) for needed Facilities expansion / relocation. This would include using funds to acquire real estate on existing leases where SFMTA holds a "right of first refusal" if the property is to be sold, or a "purchase option" as part of a lease, or other similar contract language.	Facilities for transit operations, paratransit, SSD shops, etc. are located on short-term leased property and it is in the strategic interest of SFMTA to secure long-term or permanent locations for these activities. The continued growth of transit results in a similar challenge as SFMTA has a need for long-term or permanent locations for transit operations facilities.	5-20 years	\$95,000,000	Based on estimate included in the 2017 Facilities Framework.
CN-FC07	<b>SFMTA Real Estate Capital (Joint-Use Development)</b>	The SFMTA has numerous sites in San Francisco that would be appropriate for joint-use development for housing or commercial purposes; however up-front capital is sometimes needed for predevelopment and site preparation, or for a capital contribution for concurrent SFMTA operations on-site.	Fully utilizing existing SFMTA properties provides resources to operate and maintain the Muni fleet.	5-20 years	\$20,000,000	Estimate based on past similar work.
CN-FC08	<b>2301 Stockton (Kirkland) Facility Modernization</b>	Complete rebuild of the Kirkland Division, including addition of full maintenance capacity at the division and improvements to accommodate the change of the bus fleet to battery-electric vehicles.	The division facility is over 60 years old and is obsolete and needs to be replaced. It is too small and is located among non-conforming interests. The resulting improvements will provide safer and healthier working conditions and will ensure that the transportation system is more efficient. Efficient and properly designed facilities are key to maintaining the Muni Fleet in a state of good repair.	10-20 years	\$98,000,000	Based on estimate included in the addendum to the 2017 Facilities Framework.
CN-FC09	<b>2500 Mariposa (Potrero) Facility Modernization</b>	Complete rebuild Potrero Division - fleet moves to pivot facility to remain in service while rebuild is underway. Cost estimate reflects Option 2 of the Facilities Framework, which consists of construction of a more intense development with a multi-level facility. Also includes renovations to accommodate the change of the bus fleet to all battery-electric vehicles.	The division facility is over 100 years old and is obsolete and needs to be replaced. The resulting improvements will provide safer and healthier working conditions and will ensure that the transportation system is more efficient. Efficient and properly designed facilities are key to maintaining the Muni Fleet in a state of good repair.	0-10 years	\$400,000,000	Based on estimate included in the addendum to the 2017 Facilities Framework.

CN #	Name	Description	Justification	Timeline	Total Capital Need <i>(constant 2019 dollars, rounded)</i>	Cost Information & Calculation Methodology
CN-FC10	<b>949 Presidio (Presidio) Facility Modernization</b>	Complete rebuild Presidio Division - fleet moves to interim facility while rebuild is underway. Cost estimate reflects Option 2 of the Facilities Framework, which consists of construction of a more intense development with a multi-level facility. Also includes improvements to accommodate the change of the bus fleet to all battery-electric vehicles.	The division facility is over 100 years old and is obsolete and needs to be replaced. The resulting improvements will provide safer and healthier working conditions and will ensure that the transportation system is more efficient. Efficient and properly designed facilities are key to maintaining the Muni Fleet in a state of good repair.	5-10 years	\$366,000,000	Based on estimate included in the addendum to the 2017 Facilities Framework.
CN-FC11	<b>1940 Harrison Street (Flynn) Modernization</b>	The scope of the proposed Flynn Bus Maintenance Facility Renovation project includes: lift upgrades for all in-ground lifts and hoists, roof improvements, exhaust fan upgrades, mechanical and HVAC replacement, air and diesel equipment replacement including air compressors, generators and fire pumps. Also includes improvements to accommodate the change of the bus fleet to all battery-electric vehicles.	Other than the new Islais Creek Bus Maintenance Facility, the Flynn Facility is the only location that the SFMTA can store and maintain 60 ft. motor coaches. The fleet is currently growing, and this facility needs to be modernized to maintain the new and growing fleet.	5-10 years	\$24,000,000	Based on the information included in the Facilities Condition Assessment.
CN-FC12	<b>Rubber Tire Division Wash Rack Replacement (Sustainability - Water)</b>	Provides new updated wash racks for two Rubber Tire Transit Divisions. Wash racks will be able to handle standard and/or articulated motor coaches depending on the division in which they are installed. Project includes water reclamation system and paving.	This project will result in cleaner buses, with the potential of improving customer satisfaction. It will also improve the working environment by providing more effective and modernized equipment that reduces water resource consumption and efficiently utilizes necessary cleaning chemicals.	5-10 years	\$20,000,000	Based on estimate of similar work; approximate costs are \$10M per facility
CN-FC13	<b>Enforcement Headquarters Construction</b>	Makes necessary improvements to a new headquarters for the Sustainable Streets Enforcement Sub-Division.	Improves coordination for the Security, Investigations and Enforcement (SIE) Group, and ends the short-term lease of their current facilities. Provides adequate space for SIE group job functions.	0-5 years	\$32,000,000	Based on estimate included in the addendum to the 2017 Facilities Framework.
CN-FC14	<b>Subway Station Rehabilitation Campaign</b>	Provides for ongoing rehabilitation and improvement projects in the Metro Subway stations. It includes rehabilitation of substructure, superstructure, Heating, Ventilating, and Air Conditioning (HVAC) systems, electrical systems, plumbing systems, restrooms, as well as painting and platform edge detection tile replacement.	Well-maintained subway station facilities will reduce the risk of safety hazards due to deteriorating systems. Timely replacement of assets allows for consistent and efficient station operations, i.e., replaces old systems with energy-efficient ones.	10-20 years	\$1,567,700,000	Based on needs identified by the agency's State of Good Repair database and staff assessment.
CN-FC15	<b>Solar Panel Installation at Multiple SFMTA Facilities (Sustainability - Power)</b>	Installation of solar panels at the MME and Green, Facilities. Each facility has open, clear roof space where solar panels could be installed. The resulting electrical generation could be used to power each facility and excess energy could be returned to the power grid.	This project will improve energy efficiency and would result in cost savings. It would also support the agency's sustainability goals by reducing SFMTA's use of non-renewable resources.	10-20 years	\$15,300,000	Approximately \$20 per square foot for the base installation (No seismic upgrades required as part of additional weight loads on roof), plus and escalation of 5% per year for 20 years.
CN-FC16	<b>1095 Indiana (Woods) Facility Modernization</b>	Replace paint booth, improve maintenance areas, modify some maintenance bays to accept 60' buses, upgrade existing equipment throughout the facility. Also includes renovations to accommodate the change of the bus fleet to all battery-electric vehicles.	Upgrade Woods to achieve better performance in maintenance areas, and to have facilities that can accommodate 60' buses.	10-20 years	\$400,000,000	Based on estimate of similar work and staff assessment of needs.
CN-FC17	<b>SFMTA Facility Elevator Rehabilitation Program</b>	This need focuses on elevators within SFMTA operations and maintenance facilities and supporting shops and includes replacement of several components that are most prone to failure, including door operators, landing doors, cab doors, door tracks, sills and sill angles, thus extending their useful life and improving reliability. These upgrades are especially necessary for ensuring accessibility concerns for seniors and people with disabilities.	The Capital Need will improve the reliability of station elevators and ensure consistent and safe access to stations for persons with disabilities.	0-20 years	\$21,800,000	Based on needs identified by the agency's State of Good Repair database and staff assessment.
CN-FC18	<b>Muni Metro Station Escalator Rehabilitation Program</b>	This need focuses on escalators within SFMTA Muni Metro transit stations, which will be rehabilitated or replaced to conform with current building codes and incorporate modern safety features. Capital Need includes the escalators that have not been completed or funded.	The project will improve the reliability of station escalators and ensure consistent and safe access to stations for persons with disabilities.	0-5 years	\$77,400,000	Based on needs identified by the agency's State of Good Repair database and staff assessment.



CN #	Name	Description	Justification	Timeline	Total Capital Need (constant 2019 dollars, rounded)	Cost Information & Calculation Methodology
CN-FC19	<b>Muni Metro Elevator Expansion</b>	This need focuses on elevators within SFMTA Muni Metro stations. Install new ADA compliant street and platform elevators at Muni Metro stations with level changes, including shared BART/Metro stations. Initially, elevators would be installed at stations that currently only provide one elevator, or where a fully ADA compliant elevator is not available. The full build-out would provide at least one ADA-compliant elevator at every Muni Metro access point.	The new elevators will ensure consistent and fully ADA compliant access to the underground Metro stations for people with mobility impairments and others needing the elevator for access to the stations.	0-20 years	\$40,000,000	Estimate based on past similar work.
CN-FC20	<b>Paratransit Facility</b>	Build a paratransit facility on property owned or long-term leased by City of S.F. The current cost estimate assumes the facility would share a location with a separately operated new or renovated SFMTA transit division.	Build a paratransit facility that would be leased to a paratransit service provider. The purpose behind building a facility of this type is to ensure paratransit service is met in SF, which may be problem if available spaces for leasing are not present at a future time.	5-10 years	\$135,000,000	Based on estimate from our partner service provider.
CN-FC21	<b>1 South Van Ness (SFMTA Headquarters)</b>	Perform tenant improvements at 1 SVN replacing carpets and workstations to increase capacity and space use within existing square footage. Includes modernization of conference and meeting room technology, minor improvements to shared spaces, and possible updates to the data server room.	The SFMTA has increased staff at 1 SVN (SFMTA Headquarters), however the agency is working to optimize existing square footage, rather than purchase or lease additional space in the downtown area.	0-5 years	\$6,700,000	Based on a cost estimate from the San Francisco Department of Public Works to complete the scope of work to a city-owned building.
CN-FC22	<b>eBus Facilities Conversion</b>	Convert all SFMTA rubber tire maintenance and operations facilities from existing fleet propulsion technology to battery electric buses. This conversion need includes Woods, Islais Creek, and Flynn, and short-term improvements to Kirkland prior to its full rebuild. This conversion need also includes off-site improvements to the SFMTA power supply to accommodate this transition. Presidio and Potrero are excluded because conversion of these facilities is included in complete rebuild projects (otherwise listed in this Capital Plan).	In May 2018, the SFMTA Board adopted a Zero Emission Vehicle Policy Resolution. Per the ZEV Policy, the SFMTA will begin procuring zero emission buses starting in 2025, with a goal of achieving a 100% battery electric vehicle fleet by 2035. The SFMTA is also mandated to pursue conversion to Zero Emissions buses by California Air Resources Board.	0-15 years	\$700,000,000	The cost estimate based on the current costs of the eBus Pilot Program, plus a contingency: <ul style="list-style-type: none"> <li>\$100 million for each of the major facilities (Woods, Islais Creek, and Flynn)</li> <li>\$50 million for Kirkland</li> <li>\$350 million for electrical upgrades, trenching, off-site improvements and cost of internal operational changes.</li> </ul>
CN-FC23	<b>Interim Trolley Coach Facility</b>	Improve the existing bus acceptance facility and storage yard at 1399 Marin to serve as an interim trolley maintenance facility to accommodate fleets from Potrero and Presidio during major facility rebuild.	To enable rebuild of obsolete and deficient facilities but maintain SFMTA's Muni service, the SFMTA needs to complete interim improvements at other sites to accommodate displaced fleets.	5-10 years	\$35,000,000	Based on a cost estimate from the San Francisco Department of Public Works to complete the scope of work.
CN-FC24	<b>Regulated Mobility Inspection Facility</b>	Setup and establish an inspection facility for Taxi, Commuter Shuttle, Private Transit Vehicle, Shared Mobility, Regulated Mobility Vehicles or Devices.	Improve public safety by inspecting each vehicle and shared mobility device introduced, involved in an incident, in response to complaints, and on a regular basis. This will require space, infrastructure, and equipment to handle such inspections.	10-20 years	\$10,000,000	Estimate based on past similar work.

**Fleet Capital Program**

CN #	Name	Description	Justification	Timeline	Total Capital Need <i>(constant 2019 dollars, rounded)</i>	Cost Information & Calculation Methodology
CN-FT01	<b>Cable Car Vehicle Rehabilitation (Program)</b>	This program consists of the accelerated, phased overhaul and reconstruction of the 40 vehicle Cable Car fleet. Given the cultural significance and historical importance of the Cable Car system and Fleet, it is a priority to ensure that the Cable Cars' condition is consistent with the City's pride in our fleet. The expected life of a rebuilt Cable Car is approximately 20 years, with a minor rehabilitation every 5-7 years. This program includes major rehabilitation of 17 Powell Cars and 11 California Cars to like-new condition, and mid-life rehabilitation of 10 Powell Cars and 2 California Cars. This program will ensure the availability of funding for staff and materials to complete needed rehabilitation on a rolling 5-7-year basis.	This program will maintain a high level of system reliability, safety, and productivity, providing quality service to this top tourist attraction.	0-20 years	\$41,600,000	Based on the staff assessments and updated service projections included in the 2018 Fleet Plan.
CN-FT02	<b>Historic Vehicle Rehabilitation (Program)</b>	The program consists of the systematic rehabilitation of 45 historic streetcar vehicles, featuring an end of life rehab (to like-new condition). A rehab is needed every 15 to 20 years. It includes rehab or replacement of the brake interlock system, backup master controller, electrical system, propulsion, and other systems as well as complete body repair, fare box and radio replacement, and ADA updates.	This program will maintain a high level of system reliability, safety, and productivity, providing quality service to patrons. It is necessary to keep the cars in operation since they are not replaced.	0-20 years	\$113,000,000	Based on the staff assessments and updated service projections included in the 2018 Fleet Plan.
CN-FT03	<b>Light Rail Vehicle Midlife Overhauls</b>	Includes the systematic midlife rehabilitation and overhaul of all 264 Siemens light-rail vehicles. This program includes heating ventilating and air conditioning (HVAC), brakes, couplers, pantograph, propulsion, doors, car body, seats, and cab. These figures include cars from the 45-car expansion.	Mid-life overhauls are required to ensure that the vehicles can operate for their full useful lives of 25 years.	10-20 years	\$528,000,000	Based on the projected mid-life timeline for the Siemens cars, using the per-vehicle overhaul cost.
CN-FT04	<b>Light Rail Vehicle Replacement (Program)</b>	Includes replacement of the entire fleet of Breda light rail vehicles when they reach the end of their useful life, with 151 new light rail vehicles (LRVs) that meet the operational and capacity needs of the Metro light rail system. Replacement every 25 years.	This project will provide for the modernization of the existing light rail vehicle (LRV) fleet and will also allow for greater speed, reliability, and comfort.	0-10 years	\$741,000,000	Based on costs from the LRV4 procurement.
CN-FT05	<b>Light Rail Vehicle Fleet Expansion</b>	Includes the purchase of 45 expansion light rail vehicles to meet anticipated population growth and increased service demand.	This project will provide for increased service along existing and under construction light rail lines. Expansion of the light rail fleet with modern vehicles should allow for greater speed, reliability and comfort.	0-10 years	\$204,300,000	Based on costs from the LRV4 Phase II procurement.
CN-FT06	<b>Motor and Trolley Coach Midlife Overhaul (Program)</b>	Provides for the systematic mid-life overhaul of all 894 vehicles in the motor and trolley coach fleets and new vehicles from confirmed future expansion. The program includes rehabilitation and replacement of engines; transmissions; differentials; suspension systems; wheelchair lifts; passenger and driver seats; glass; and body repair and paint.	The primary focus of this program is to maintain the motor and trolley coach fleet in a state of good repair by replacing key components midway through the vehicle's useful life. Mid-life rehabilitation of the fleets ensure that the vehicles operate in a safe and secure manner, reducing safety hazards and vandalism. In addition, this rehabilitation program will allow each vehicle to reach its full useful life before needing to be replaced. Timely rehabilitation of the motor coach and trolley fleet reduces the number of breakdowns and improves service reliability. Trolley- 368 overhauls; Motor Coach- 1,389 overhauls	0-20 years	\$906,700,000	Based on the projected mid-life timeline for the trolley and motor coaches, using the per-vehicle overhaul cost.
CN-FT07	<b>Motor Coach Replacement (Program)</b>	Entails the replacement of 564 (616) standard and articulated motor coaches with hybrid motor coaches before 2025 and BEB in and after 2025. This program seeks to replace the existing fleet and future confirmed expansion vehicles to a state of good repair, replacing old equipment with the latest and most advanced zero-emissions technology available. Replacement every 12 years. Potential further expansion of 110 additional coaches would also require one replacement cycle.	The new coaches will offer greater reliability and safety with enhanced transmission-based brake retarders, composite materials, slip resistant flooring, and better mirrors. As a result, this project will improve agency safety and security, as well as improved transit reliability, on-time efficiency, and customer satisfaction. Replacement vehicles purchased: 66 30-foot vehicles; 657 40-foot vehicles; and 436 60-foot vehicles.	0-20 years	\$1,868,100,000	Based on the per vehicle cost of the all battery-electric coaches.



CN #	Name	Description	Justification	Timeline	Total Capital Need (constant 2019 dollars, rounded)	Cost Information & Calculation Methodology
CN-FT08	<b>Motor Coach Expansion (Program)</b>	Expansion of the motor coach fleet, both in number of vehicles and vehicle capacity, to accommodate projected growth. Expansion after 2018 may include up to 110 additional motor coaches to a total of 674. These expansion vehicles would include those needed to provide expanded service to planned major developments (Parkmerced, Treasure Island, Hunters Point/Candlestick Point Shipyard).	The expansion of the motor coach fleet is needed to meet projected ridership demand. In addition, new fleet procurements will help meet operational needs for larger capacity vehicles and help meet zero emissions targets. Expansion vehicles purchased: 53 40-foot vehicles and 106 60-foot vehicles.	0-5 years	\$230,200,000	Based on costs from prior motor coach procurement.
CN-FT09	<b>Trolley Coach Replacement (Program)</b>	All trolley coaches will be replaced with battery-electric buses (BEBs).	Timely replacement of trolley coach vehicles reduces the number of incidents and breakdowns from vehicle deterioration and age, contributing to greater reliability and a cleaner and more comfortable experience for the customer and employee. Replacement vehicles purchased: 204 40-foot vehicles and 102 60-foot vehicles.	0-20 years	\$489,400,000	Based on the per vehicle cost of the all battery-electric coaches.
CN-FT10	<b>Paratransit Fleet Replacement (Program)</b>	The routine, scheduled replacement of large Type B cutaway vans with Type A vans every five years. The capacity of the new Type A cutaway vans will be the same as the Type B vans, at two wheelchair users and twelve seated passengers.	This project will replace the current fleet of vehicles used to deliver ADA and non-ADA paratransit service (e.g. paratransit taxi & group van service), providing for newer, modern vehicles and better access for persons with disabilities who are unable to access the fixed route transit system.	0-20 years	\$79,300,000	Based on the projected cost of the planned paratransit fleet procurement.
CN-FT11	<b>Paratransit Fleet Expansion (Program)</b>	Expansion in the number of vehicles in the Paratransit Fleet to accommodate expected growth in service demand. Starting in 2023, five Type A vans will be purchased every five years through 2039.	This project will expand the current fleet of vehicles used to deliver ADA and non-ADA paratransit service (e.g. paratransit taxi & group van service), providing more vehicles and better access for persons with disabilities who are unable to access the fixed route transit system.	5-20 years	\$2,600,000	Based on the projected cost of the planned paratransit fleet procurement.
CN-FT12	<b>Non-Revenue Vehicle Replacement (Program)</b>	Consists of the purchase and replacement of non-revenue vehicles, such as specialized maintenance vehicles, as well as light and heavy-duty trucks and sedans that are used throughout the agency. This project will replace existing non-revenue vehicles at the end of their useful life. This program assumes vehicle upgrades as the City transitions to a zero-emissions fleet. This program also aligns with expected changes air emissions standards.	On-time replacement or upgrade of non-revenue vehicles ensures that employees can effectively support the operations of the transportation system and efficiently access locations where there are service incidents and perform corrective measures. Many vehicles have significantly exceeded their useful lives and their current condition presents challenges for maintaining effective operations.	0-20 years	\$108,800,000	Based on the per vehicle cost, assuming the mandated transition to zero-emission vehicles.
CN-FT13	<b>Replacement of Other On-Board Equipment</b>	Replacement of on-board monitoring and control equipment. Includes replacement of CCTV, automatic passenger counters, radio, and on-board ATCS equipment. Replacement required every five to six years when not provided with a new vehicle.	Replacement of on-board equipment is required to maintain safe and efficient operations. The equipment does not last as long as the vehicles on which it is placed.	0-20 years	\$106,000,000	Estimate based on past similar work.



## Parking Capital Program

CN #	Name	Description	Justification	Timeline	Total Capital Need (constant 2019 dollars, rounded)	Cost Information & Calculation Methodology																																																				
CN-PK01	<b>Electric Vehicle Charging Stations</b>	Upgrade and expand upon the portfolio of EV chargers in city-owned garages. The current portfolio of about 50 chargers has reached the end of its useful life and is no longer supported by the vendor with replacement parts as of 12/31/2018.	Upgrading existing Level 2 EV chargers and adding additional Level 2 and DC fast chargers will address the growing public demand for EV charging and support the SFMTA's and the city's sustainability goals. Also, the hardware has a five-year life expectancy, and should therefore be replaced four times over a 20-year span.	0-20 years	\$5,000,000	Estimate based on past similar work.																																																				
CN-PK02	<b>Implement Parking, Loading, Bicyclist, Pedestrian and Other Mobility Mode Movement and Stopping Detection Technology</b>	Implement detection technology to measure parking occupancy, loading zone usage, double parking, bicyclist movements and counts, pedestrian movements counts, and other mobility mode user movements and counts. This data will support demand-responsive meter rate adjustments, analysis of requested parking regulation changes, curb management, bicycle and pedestrian planning, engineering, Vision Zero initiatives, and transparency in decision-making.	Improving parking availability, curb management, and bicycle/pedestrian/safety project implementation will help make our streets safer and more efficient.	0-20 years	\$29,000,000	<table border="1"> <thead> <tr> <th>Procurement Date</th> <th>Sensor Unit Cost</th> <th>Number of Sensors</th> <th>Cost</th> </tr> </thead> <tbody> <tr> <td>FY 2020</td> <td>\$300</td> <td>30,000</td> <td>\$9,000,000</td> </tr> <tr> <td>FY 2028</td> <td>\$250</td> <td>40,000</td> <td>\$10,000,000</td> </tr> <tr> <td>FY 2036</td> <td>\$200</td> <td>50,000</td> <td>\$10,000,000</td> </tr> <tr> <td colspan="3">Total:</td> <td>\$29,000,000</td> </tr> </tbody> </table>	Procurement Date	Sensor Unit Cost	Number of Sensors	Cost	FY 2020	\$300	30,000	\$9,000,000	FY 2028	\$250	40,000	\$10,000,000	FY 2036	\$200	50,000	\$10,000,000	Total:			\$29,000,000																																
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CN-PK03	<b>Parking Facilities State of Good Repair (Program)</b>	Restoration of 38 parking facilities that provide nearly 15,000 parking spaces, 90,000 sq. ft. of retail space and generate over \$90M in annual gross revenues. Includes major rehabilitation, preservation, and improvement of existing parking facilities to enhance parking infrastructure and improve parking management. Implements improvements to elevators, parking decks/drive aisles, energy efficient lighting, and mechanical systems (e.g., HVAC, sump pumps), CCTV surveillance systems, and bike parking as well as compliance with ADA regulations and various Planning, Building and Fire Codes.	When completed, this project will extend the useful life of major revenue-generating assets, enhance safety of public facilities, as well as help provide better services for those bicycling, carpooling and carsharing	0-20 years	\$360,000,000	Based on a City and County of San Francisco Department of Public Works estimate, using SFMTA State of Good Repair analysis. Adjusted to remove work completed through 2018, then escalated 2019 dollars.																																																				
CN-PK04	<b>Parking Meters State of Good Repair (Program)</b>	Replaces and modernizes equipment for all 27,000 metered parking spaces. All on-street parking meters were replaced in 2014. This estimate accounts for three additional replacements within the next 20 years. Assumes expansion of number of meters during replacements.	Modernizing existing parking meters will improve reliability and increase driver convenience by accepting non-cash forms of payment. Modernized meters will also allow for demand-responsive pricing.	0-20 years	\$117,600,000	<table border="1"> <thead> <tr> <th>Procurement year</th> <th>2021 Unit price</th> <th>2031 Unit Price</th> <th>2041 Unit price</th> </tr> </thead> <tbody> <tr> <td>Single Space Mechanisms</td> <td>\$515</td> <td>\$592</td> <td>\$681</td> </tr> <tr> <td>Housing</td> <td>\$ -</td> <td>\$ -</td> <td>\$ -</td> </tr> <tr> <td>Lock</td> <td>\$125</td> <td>\$144</td> <td>\$165</td> </tr> <tr> <td>Pay stations</td> <td>\$6,600</td> <td>\$7,590</td> <td>\$8,729</td> </tr> <tr> <td>Total SS</td> <td>\$640</td> <td>\$736</td> <td>\$846</td> </tr> <tr> <td>Total MS</td> <td>\$6,600</td> <td>\$7,590</td> <td>\$8,729</td> </tr> <tr> <td>SS procured</td> <td>15,000</td> <td>3,000</td> <td>-</td> </tr> <tr> <td>MS procured</td> <td>2,418</td> <td>4,080</td> <td>4,560</td> </tr> <tr> <td>Subtotal</td> <td>\$25,558,800</td> <td>\$33,175,200</td> <td>\$39,801,960</td> </tr> <tr> <td>Contingency 10%</td> <td>\$2,555,880</td> <td>\$3,317,520</td> <td>\$3,980,196</td> </tr> <tr> <td>Sales tax</td> <td>\$2,389,748</td> <td>\$3,101,881</td> <td>\$3,721,483</td> </tr> <tr> <td>Total cost</td> <td>\$30,504,428</td> <td>\$39,594,601</td> <td>\$47,503,639</td> </tr> </tbody> </table>	Procurement year	2021 Unit price	2031 Unit Price	2041 Unit price	Single Space Mechanisms	\$515	\$592	\$681	Housing	\$ -	\$ -	\$ -	Lock	\$125	\$144	\$165	Pay stations	\$6,600	\$7,590	\$8,729	Total SS	\$640	\$736	\$846	Total MS	\$6,600	\$7,590	\$8,729	SS procured	15,000	3,000	-	MS procured	2,418	4,080	4,560	Subtotal	\$25,558,800	\$33,175,200	\$39,801,960	Contingency 10%	\$2,555,880	\$3,317,520	\$3,980,196	Sales tax	\$2,389,748	\$3,101,881	\$3,721,483	Total cost	\$30,504,428	\$39,594,601	\$47,503,639
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CN-PK05	<b>Parking Access Revenue Control System</b>	Upgrade of the Parking Access and Revenue Control Systems (PARCS) software, hardware, ticket dispensers, gate arms, registers, ticket acceptors, ticket readers, and pay stations at 20 SFMTA off-street parking garages.	The PARCS equipment is currently being replaced, to be completed in 2020. The equipment has a 5-7 year expected life, therefore it will need to be replaced about three times over a 20-year span.	5-10 years	\$45,000,000	Estimate based on past similar work.																																																				



CN #	Name	Description	Justification	Timeline	Total Capital Need <i>(constant 2019 dollars, rounded)</i>	Cost Information & Calculation Methodology
CN- PK06	<b>Parking Facility Structural and Seismic Upgrades</b>	Most of SFMTA's parking structures are at least 20 years old (oldest garage was built in 1941). Performing a structural analysis to assess the integrity of the SFMTA garages is the first and necessary step to ensure the viability of SFMTA parking assets. The second step is to implement structural and seismic upgrades, where needed.	Improving the seismic and structural integrity of existing parking structures increases the resiliency of the facilities in the event of a natural disaster.	10 years	\$120,000,000	Estimate based on past similar work.
CN- PK07	<b>HDTV Monitoring Cameras for Off-Street Metered Parking Lots</b>	SFMTA's 19 metered off-street parking lots throughout commercial corridors in the city are unstaffed. Monitoring cameras will allow SFMTA staff to more efficiently monitor lot operations and provide HD video to assist MTA, PW and PD in following up on security and maintenance issues.	Oversight of the metered lot portfolio currently requires staff to periodically drive around the city to complete inspections. Installation of HD cameras connected via proprietary city fiber-optic cable back to the MTA Parking Command Center at the TMC will significantly enhance staff's efficiency and effectiveness in managing lot operations.	0-20 years	\$4,000,000	Estimate based on past similar work.

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## Security Capital Program

CN #	Name	Description	Justification	Timeline	Total Capital Need <i>(constant 2019 dollars, rounded)</i>	Cost Information & Calculation Methodology												
CN-SC01	<b>Threat and Vulnerability Assessment (TVA) and Implementation</b>	This capital need addresses two major elements of threat and vulnerability assessment which includes review and mitigation implementation. Capital need CN-SC01 funds biennial or "as-needed" emergency management and security reviews of major threats and vulnerabilities to SFMTA's critical infrastructure, assets, and facilities. Based on these reviews or other sources (such as incident and exercise after-action reports), the capital need covers the implementation of high-priority mitigation and preparedness projects to protect critical SFMTA facilities, assets, and infrastructure. Project represented by this capital need address natural, manmade, or cyber-security threats of the SFMTA with an emphasis on Rail Transit Security.	Improves safety and security for employees and customers by planning for and implementing solutions to reduce impacts of natural, manmade, or cybersecurity disasters. The annual reviews and strategies developed from these reviews ensure the agency meets its regulatory requirements.	0-20 years	\$67,000,000	Cost estimate is based on similar consultant studies conducted by the City and County of San Francisco.												
CN-SC02	<b>Incident Management Planning and Response</b>	Fund continuous upgrades of emergency communications equipment (satellite phones, radios) and supplies for SFMTA Divisions; interagency common operating picture operations; post-disaster damage and safety assessment. The exact projects are driven by after-action reports from incident response activations and/or emergency management exercises.	Improves the agency's emergency response capabilities while-complying with regulations.	0-20 years	\$4,700,000	<table border="0"> <tr> <td>Equipment:</td> <td>Approximate cost:</td> </tr> <tr> <td>Radios (all SFMTA Divisions)</td> <td>\$250,000</td> </tr> <tr> <td>Satellite phones</td> <td>\$10,000</td> </tr> <tr> <td>COP</td> <td>\$125,000</td> </tr> <tr> <td>Supplies (batteries; power packs, etc.)</td> <td>\$50,000</td> </tr> <tr> <td>Project Management</td> <td>\$150,000</td> </tr> </table>	Equipment:	Approximate cost:	Radios (all SFMTA Divisions)	\$250,000	Satellite phones	\$10,000	COP	\$125,000	Supplies (batteries; power packs, etc.)	\$50,000	Project Management	\$150,000
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CN-SC03	<b>Surveillance, Access Control, and Security System Enhancements</b>	Annual high-priority security enhancement measures such as perimeter security enhancements, surveillance equipment, video analytics and monitoring, employee security access control, equipment, signs, training manuals, and cyber security systems.	Maintains the security of SFMTA facilities as mandated by regulations.	0-20 years	\$15,000,000	Estimate based on past similar work.												
CN-SC04	<b>Technology in Transportation Emergency Management</b>	Implementation of technology projects from industry best practices to enhance rail system security and employee/customer protection during normal operations as well as to augment response capabilities for all-hazard disasters on the rail system. Systems include emergency command vehicles; disaster, evacuation, and recovery modeling systems; portable digital message boards; intelligent traffic signal management system, and redundant and interoperable communication systems.	Enhances the transportation operations and emergency management capabilities of SFMTA.	0-20 years	\$25,200,000	Cost assumes \$20,475,000 from 2015 estimates. It then adds \$250,000 for ongoing replacement and overhaul costs.												
CN-SC05	<b>Subway Tunnel Intrusion Detection and Deterrence Measures</b>	This capital need funds the procurement, installation, and staff training of an upgraded video-based alert system in our subway that actively monitors and detects intrusions into secured areas. This system would monitor our subway stations, tunnels, platforms, and trackside protection assets. This capital need also funds security enhancements related to more traditional methods of intrusion detection and deterrence such as CCTV upgrades/expansion, site hardening, trackside protection reinforcement, lighting, alarms, and upgraded sensors.	This capital need reduces the potential service disruption and protects SFMTA passengers and employees while complying with regulatory requirements. Intentional or unintentional intrusion into our network has been identified as an issue which poses not only a safety and security risk, but a risk to the overall service delivery of the organization.	0-20 years	\$297,200,000	Based on preliminary estimates from the Transit Maintenance of Way Team and the SFMTA Video Shop vendors. Estimates assume a useful life of 5 years for hardware and annual renewal of software packages to support the hardware. Cost estimates from vendor proposal for a 2-station pilot study, linearly extrapolated to 9 stations, plus in-house contract and project management and contingency.												



CN #	Name	Description	Justification	Timeline	Total Capital Need <i>(constant 2019 dollars, rounded)</i>	Cost Information & Calculation Methodology
CN-SC06	<b>Market Street Natural Hazard Mitigation</b>	Implementation of the San Francisco Lifelines Council's recommendations outlined in the San Francisco Lifelines Council Interdependency Study to mitigate risks from natural hazards to SFMTA infrastructure assets above and below Market Street. Mitigation recommendations primarily are concerned with earthquake, but also recognize the significant impact of earthquake related flooding and fire as well as long-term needs for mitigation due to sea level rise and climate changes. These mitigation strategies include but are not limited to subway, surface rail, electric sub-station, and trolley bus related infrastructure.	The SF Lifelines Council is a private/public partnership sponsored by the San Francisco Office of Resilience and Recovery. The purpose of the Council is to focus on post-disaster reconstruction and recovery efforts. The "Interdependency Study" identified Market Street Corridor where many major components of many lifeline systems are collocated and interdependent. The corridor also represents an area of Very High to Moderate risks of liquefaction. The study recommends coordinating post-disaster action plans in coordination with partner Lifeline Council members. SFMTA would work closely with other City agencies as well as BART and other regional transit partners.	0-20 years	\$100,000,000	Based on estimate of similar work; assumes cost sharing among pertinent departments such as SFMTA, Public Works, Public Utilities Commission, et. al.
CN-SC07	<b>Subway Flooding Prevention, Preparedness, and Mitigation</b>	Conduct an all-hazard review of the SFMTA subways to prevent, prepare, and mitigate risks, primarily of flooding. A systemwide review is needed every 5 to 10 years.	Maintains the integrity of SFMTA assets and prevents service disruption in the event of major natural disasters.	0-20 years	\$25,800,000	Estimate of \$950,000 to complete a study, with anticipated project costs of: \$750,000 for pre-engineering, \$1,000,000 for design, \$3,000,000 for construction, and \$750,000 for project management. Cost estimate to be updated as more information on the extent of vulnerability is determined.
CN-SC08	<b>Continuity of Operations</b>	Implement measures to ensure that the SFMTA would continue its essential functions after a major disaster. One example would be to set up and/or maintain alternate site(s) for the Department Operation Center for coordinating rail and bus operations in a post-disaster situation. Similar needs also exist for other essential SFMTA functions should the SFMTA headquarters become inaccessible for safe operations.	Maintains essential SFMTA operations in the event of a major disaster.	0-20 years	\$6,800,000	Based on estimate of similar facility setup costs. Cost estimate to be updated as more information on the location is determined.
CN-SC09	<b>Traffic Signal Battery Backup System</b>	Replacement or expansion of traffic signal battery backup system installed in FY17 or earlier. The useful life of the current backup system is about five years at this time.	Maintains traffic safety after a major power outage or natural/manmade disaster. Costs are offset by the otherwise need for PCOs staffing intersections and controlling traffic.	0-20 years	\$15,200,000	Estimate based on past similar work.

**Streets Capital Program**

CN #	Name	Description	Justification	Timeline	Total Capital Need <i>(constant 2019 dollars, rounded)</i>	Cost Information & Calculation Methodology
CN-ST01	<b>Bicycle and Shared Mobility Parking (Program)</b>	Includes the installation of 1,000 bicycle racks per year (e.g., sidewalk racks, on-street racks); wheel stops; bollards; corrals and other measures to facilitate parking for personal bicycles and other shared mobility options at various locations throughout San Francisco. Also includes the installation of 7 bicycle parking stations, one every three years, which are self-service or attended facilities that have controlled access for secure storage of a bicycle; and the installation of 160 bicycle lockers, 8 per year. Secure bicycle lockers provide flexible, shared use, on-demand bicycle parking options.	These facility improvements serve the entire system through the provision of safe, convenient bicycle parking so that cyclists can access desired land uses at the end of their trips. These facilities serve the entire system by providing for bicycle storage needs, making bicycle transportation a safer, more viable, attractive mode in San Francisco.	0-20 years	\$31,800,000	Bike stations have a unit cost of \$1,000,000/station, bike lockers \$12,063/locker, bike racks \$1,000/rack. 10% contingency added.
CN-ST02	<b>Protected Bike Lane Network</b>	Add new protected bike lanes and upgrade existing Class II bike lanes to physically protected facilities to create a safer citywide bicycle network of protected bike lanes suitable for a wide range of users. Specific protected bike lane infrastructure includes transit boarding islands to provide protection from bus passenger loading and buffer paint and traffic delineators. Additionally, implementation of concrete barriers to separate traffic from people bicycling, and signal and sign upgrades improves safety and increases ease of bicycling.	Protected bike lanes improve safety and add to the comfort of bicyclists, making San Francisco's bicycle infrastructure more accessible to a wider range of users. This will help the SFMTA achieve the strategic goal of creating a safer transportation experience for everyone and assist in meeting the Vision Zero goal.	0-20 years	\$720,000,000	\$4,000,000 per mile based on recent 7th St and 8th St protected lanes. Includes: <ul style="list-style-type: none"> <li>• 4 transit boarding islands per mile at \$100,000 each</li> <li>• 2 signal modifications per mile at \$250,000 each</li> <li>• 2 new traffic signals per mile at \$1,000,000 each</li> <li>• Signing and striping \$600,000 per mile</li> <li>• 20 concrete barriers, islands, and pedestrian refuges per mile at \$30,000 each</li> </ul> Estimated 180 miles of protected bike lanes
CN-ST03	<b>Neighborway Network</b>	Provide a network of safe and comfortable local streets to connect people walking and biking to schools, parks and other local destinations. Specific improvements include new traffic signals and signs to facilitate bicycle travel, and concrete infrastructure like islands, speed humps, and traffic circles to slow down vehicle speed.	Neighborways reduce the speed and amount of automobile traffic on local streets thereby improving user safety and promoting the residential character of streets and making them more accessible to bicyclists. These facilities will help the City achieve the Vision Zero goal.	0-20 years	\$226,000,000	\$1,675,000 per mile based on Wiggle Green Corridor cost estimates. Includes: <ul style="list-style-type: none"> <li>• 1 new traffic signals per mile as \$1,000,000 each</li> <li>• 1 new RRFB per mile at \$200,000 each</li> <li>• 4 concrete islands, diverters, and/or traffic circles per mile at \$30,000 each</li> <li>• 8 speed humps per mile at \$10,000 each</li> <li>• 4 curb extensions per mile at \$50,000 each</li> </ul> Signing and striping at \$75,000 per mile Estimated 135 miles of neighborways
CN-ST04	<b>Bicycle Network State of Good Repair (Program)</b>	Replace signs, striping, green pavement, bike signals, and other bicycle facilities. Includes Spot Improvement upgrades to ensure that bicycle facilities are upgraded to meet evolving best practices.	Rehabilitating the bicycle network encourages bicycling and maintains the network in a State-of-Good-Repair. These investments contribute to meeting the Bicycle Program goals.	0-20 years	\$147,000,000	\$6,850,000 per year: <ul style="list-style-type: none"> <li>• 300,000 sq. ft of epoxy green paint per year at \$6 per square foot (assumes useful life of 5 years)</li> <li>• 50,000 sq. ft of thermoplastic green paint per year at \$16 per square foot (assumes useful life of 5 years)</li> <li>• 400k linear feet of thermoplastic striping per year at \$3 per linear foot (assumes useful life of 5 years)</li> <li>• \$3M per year for routine upgrades and spot improvements to maintain facilities consistent with evolving industry best practices.</li> </ul> Counter maintenance \$60,000 per year

CN #	Name	Description	Justification	Timeline	Total Capital Need <i>(constant 2019 dollars, rounded)</i>	Cost Information & Calculation Methodology
CN-ST05	<b>Pedestrian Safety</b>	Pedestrian Core Projects will implement the key infrastructure needed to meet the City's Vision Zero goals, using proven pedestrian countermeasures at the highest need locations. The work will be guided on the City's high injury network and range from intersection improvements such as bulb-outs to major corridor transformations, it additionally includes the costs to maintain existing safety infrastructure such as paint and signage in good condition. This reflects the need to improve 130 miles of San Francisco streets for Vision Zero.	Implementing these projects are the cornerstone of the City's Vision Zero program. The focus in this category on the highest need streets will makes streets safer and more accessible for all users, specifically vulnerable citizens - seniors, people with disabilities, and children, who are more likely to be severely injured if involved in collisions. The goal of this programming is to fund the needed engineering improvements to get to zero traffic fatalities annually. The projects will reduce injuries and collisions City-wide, but especially in high-risk communities such as the Tenderloin and South of Market.	0-20 years	\$1,517,000,000	Estimated at \$480,000,000 in 2013 WalkFirst scenario for a 20-year investment, escalated at 4% annually and apportioned costs over 20 years
CN-ST06	<b>Pedestrian Walkability and Neighborhood Enhancements</b>	This category enhances the existing pedestrian environment and builds on the pedestrian safety projects by focusing on improving streets to make them more walkable. Projects include walkability improvements on neighborhood connections, such as wider sidewalks and green infrastructure, especially where people already walk. It further builds on local neighborhood corridors to promote walking and economic development, tapping into economic potential. Lastly, this category targets infrastructure deficiencies- locations where there are not high injuries but there are major impediments or barriers to walking, such as highway underpasses, rail crossings or lack of sidewalks in areas experiencing (and targeted for) new growth. This assumes that these improvements are needed on all streets, citywide.	In addition to safety, the SFMTA is committed to making walking a preferred mode choice. The focus on this category is to make key streets more walkable to increase the number of trips made by walking in the City. This is through improving existing streets where people walk, improving local neighborhood shopping corridors and reducing the number of infrastructure real or perceived barriers to walking.	0-20 years	\$2,195,000,000	Estimated at \$800,000,000 in 2013 WalkFirst scenario for a 20-year investment, escalated at 4% annually and apportioned costs over 20 years
CN-ST07	<b>Traffic Calming</b>	The Traffic Calming Program responds to neighborhood concerns about traffic safety on local streets across San Francisco. Special traffic calming programs additionally address schools, seniors and people with disabilities, populations that have disparately poor outcomes when involved in a traffic collision. Traffic calming devices such as speed humps, pedestrian bulb-outs, traffic circles, median islands are considered and installed at various locations in the city. Some of the more intensive traffic calming projects may include features such as chicanes, traffic diverters, signalized pedestrian crosswalks and street closures. Program is comprised of Application-Based Residential Traffic Calming, and Proactive Residential Area Improvement sub-programs.	These projects will improve pedestrian and bicycle safety and promote walking and cycling for all school aged children in San Francisco.	0-20 years	\$89,300,000	This assumes current level of approximately \$3,000,000 annually spent on TC including application-based, schools, pro-active and NTIP programming. It escalates at 4%.
CN-ST08	<b>Commuter Shuttle Stop and Infrastructure Improvements</b>	Provide funding for the creation and improvement of existing commuter shuttle and private transit vehicle stops, along with associated pedestrian amenities.	Create dedicated CIP program to better track restricted permit fees moved to capital programs.	0-20 years	\$8,000,000	Estimate based on past similar work.
CN-ST09	<b>Scooter and Shared Mobility Infrastructure</b>	Provide funding for the creation and improvement of existing scooter and shared mobility designated parking areas and racks. This would also provide for proportional shared costs of the installation of bike lanes and infrastructure.	Create dedicated CIP program to better track restricted permit fees moved to capital programs.	0-20 years	\$2,000,000	Estimate based on past similar work.

## Taxi Capital Program

CN #	Name	Description	Justification	Timeline	Total Capital Need <i>(constant 2019 dollars, rounded)</i>	Cost Information & Calculation Methodology
CN-TA01	<b>Accessible Taxi Rebate Program</b>	Establish a rebate program for new purpose-built accessible vehicles purchased by companies or medallion holders to incentivize the purchase of wheelchair accessible vehicles. This program will subsidize costs for one of the more expensive vehicle types in the taxicab fleet which provides arguably one of the most important services. Greater incentives may be provided to operators willing to purchase alternative fuel accessible vehicles.	Improve mobility options for those unable to use other transportation options for some or all trips. The MTA views transportation vehicles as capital investments, the need to offer accessible vehicles therefore is a capital expense as is needed for capital expense to assist the purchase and availability of accessible vehicles.	0-20 years	\$10,500,000	Based on the per unit cost of accessible conversion packages for 100 ramp medallions with a 3-year life cycle.
CN-TA02	<b>Refurbish and Increase Taxi Stands</b>	In an effort to increase service to the outer city, approximately 100 taxi stands will be established across the city at major hail hubs to better manage and direct taxi flow and utilization. This will also fund major refurbishments of existing taxi stands, ongoing maintenance of all taxi stands, and improve wayfinding to such stands.	Taxi stands establish locations so that taxis can be easier found throughout the city and aids in movement throughout the city for individuals or groups who chose, or require, taxis as their travel mode.	0-20 years	\$5,300,000	Estimate of \$5,000 for the planning and installation of a new stand, and \$2,500 annually to maintain each stand thereafter.
CN-TA03	<b>Taxi Clean Fuel and All Electric Rebate Program</b>	Rebate program to incentivize the purchase of clean fuel and eventually all electric and equivalent (such as hydrogen) vehicles. Greater incentives are provided to operators willing to purchase the cleanest vehicles available. This may also include electrification infrastructure improvements.	In an effort to make a 100% green taxi fleet; the SFMTA offers drivers a rebate incentive for the purchase of a clean fuel vehicle. This incentive is given to offset the increased costs of purchasing a non-clean fuel vehicle.	0-20 years	\$37,200,000	Based on past utilization of the program.
CN-TA04	<b>Taxi and Regulated Mobility Management System</b>	Provide funding for the creation and implementation of a permit and fleet management system for taxicabs and regulated mobility vehicles. This system would include the ability to monitor vehicle location, affiliation, insurance and inspection status. There will also be an interface that allows the system to integrate driver information from other databases which will allow staff to track driver history, complaints, and compliments as well as allow staff to issue real-time citations to drivers in the field. There will also be a function that allows drivers and companies to pay fees through various user interface portals.	This project will help streamline taxicab and regulated mobility regulation management by allowing multiple functions to be managed in one database through one system. Currently there are numerous databases and paper files to track activity in the industry including vehicle management, and as the industry expands it is becoming increasingly difficult to manage the growth through paper files and various systems.	0-20 years	\$4,500,000	Based on costs of devices and fleet software for tracking and management, as well as back-end internal and public facing web-based systems.
CN-TA05	<b>Taxi Safety Camera Management System</b>	Upgrade the existing individually-maintained on-board camera system to one standardized system that can be centrally managed by SFMTA to ensure video footage can be used for safety purposes, are properly preserved, and readily available. This program will also include updates to the system at least every ten years as technology changes.	Currently, each vehicle may have a different on-board camera hardware, which is maintained by the vehicle owner or company. Video footage is manually pulled from the SD card upon request, which presents difficulties if the camera is not maintained, the card is not present, a request to provide video is refused, or there is significant delay in providing such footage. A management system selected and managed by SFMTA will allow better and faster access in response to complaints for enforcement for passenger and public safety.	5-20 years	\$3,600,000	Based on estimate of similar work to integrate devices into agency fleet software for tracking and management.
CN-TA06	<b>Paratransit Dispatch App</b>	Create one standardized app platform for paratransit users to hail paratransit and accessible taxicab vehicles. This program will also include updates to the app at least every ten years as technology changes.	Improve mobility options for those unable to use other transportation options for some or all trips. This is to serve an unmet need for an underserved population.	5-20 years	\$4,000,000	Based on approximate cost of development, launch, and promotion for the app.

**Traffic Signals & Signs Capital Program**

CN #	Name	Description	Justification	Timeline	Total Capital Need <i>(constant 2019 dollars, rounded)</i>	Cost Information & Calculation Methodology																												
CN-SG01	<b>Automated Photo Traffic Enforcement</b>	Provides for the replacement of photo enforcement for 23 existing approaches and adding an additional 10 approaches.	Automated Photo Enforcement systems improve intersection safety by improving compliance, reducing the number of vehicle crashes. Established systems include red light photo and illegal turn enforcement. Others, like speed, require state legislature approval.	0-20 years	\$9,000,000	Replacement of photo enforcement for 23 existing approaches (\$300,000 per intersection), including an option for an additional 10 approaches.																												
CN-SG02	<b>Signal Infrastructure State of Good Repair (Program)</b>	Encompass upgrades of existing traffic control devices, including modifications to existing signals that lack a pedestrian countdown feature, mast arms, 12" signals, battery backup systems, accessible pedestrian signals, wireless detectors, or related amenities. The project also includes the upgrade or replacement of signal equipment that is at the end of its useful life (50 years).	Support the Vision Zero program by improving safety, reducing the number of injuries through improved traffic control (e.g., where pedestrian countdown signals and signal visibility improvements are provided as part of a signal modification effort).	0-20 years	\$1,064,000,000	<table border="1"> <thead> <tr> <th>Type of Signal Work</th> <th>Cost</th> </tr> </thead> <tbody> <tr><td>PCS Contract</td><td>\$80,000,000</td></tr> <tr><td>PCS Contract</td><td>\$30,000,000</td></tr> <tr><td>Signal Mod Contract</td><td>\$140,000,000</td></tr> <tr><td>Corridor Contract</td><td>\$150,000,000</td></tr> <tr><td>Corridor Contract</td><td>\$75,000,000</td></tr> <tr><td>State of Good Repair Contract</td><td>\$300,000,000</td></tr> <tr><td>State of Good Repair Contract</td><td>\$150,000,000</td></tr> <tr><td>Install Conduits &amp; poles</td><td>\$80,000,000</td></tr> <tr><td>12" Signal Visibility Upgrades</td><td>\$12,000,000</td></tr> <tr><td>Sensys</td><td>\$6,000,000</td></tr> <tr><td>BBS</td><td>\$30,000,000</td></tr> <tr><td>APS</td><td>\$6,000,000</td></tr> <tr><td>Controller Cabinets</td><td>\$5,000,000</td></tr> </tbody> </table>	Type of Signal Work	Cost	PCS Contract	\$80,000,000	PCS Contract	\$30,000,000	Signal Mod Contract	\$140,000,000	Corridor Contract	\$150,000,000	Corridor Contract	\$75,000,000	State of Good Repair Contract	\$300,000,000	State of Good Repair Contract	\$150,000,000	Install Conduits & poles	\$80,000,000	12" Signal Visibility Upgrades	\$12,000,000	Sensys	\$6,000,000	BBS	\$30,000,000	APS	\$6,000,000	Controller Cabinets	\$5,000,000
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CN-SG03	<b>Sign Infrastructure State of Good Repair (Program)</b>	Sign work in this category includes pavement marking installations and the graffiti program, where existing signs are replaced with signs that have higher reflectivity, and a coating that eases graffiti removal.	Support the Vision Zero program by improving safety through improved visibility of pavement markings and traffic signs.	0-20 years	\$16,000,000	<table border="1"> <thead> <tr> <th>Work</th> <th>Cost Details</th> <th>Total Cost</th> </tr> </thead> <tbody> <tr> <td>Grffiti Program</td> <td>2000 signs/year at \$200/sign over 20 years</td> <td>\$8,000,000</td> </tr> <tr> <td>New Signs</td> <td>2000 signs/year at \$200/sign over 20 years</td> <td>\$8,000,000</td> </tr> </tbody> </table>	Work	Cost Details	Total Cost	Grffiti Program	2000 signs/year at \$200/sign over 20 years	\$8,000,000	New Signs	2000 signs/year at \$200/sign over 20 years	\$8,000,000																			
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CN-SG04	<b>Traffic Management State of Good Repair (Program)</b>	This includes street paint marking/stripping, parking control curb painting.	Maintaining existing infrastructure in a state of good repair will help ensure a safe and reliable street network.	0-20 years	\$7,200,000	Estimate of 12 corridors per year for 20 years, at \$30,000 per corridor.																												
CN-SG05	<b>New Signals &amp; Signs (Program)</b>	Provides for installation of new traffic signals, signs, pavement markings and related traffic control hardware, with an emphasis on new locations. Over a 20-year period, this program anticipates installing a mix of 10 new signals and/or flashing beacons every other year and 1,500 new signs per year.	Support the Vision Zero project to improve safety at crash or other problem locations. This project reduces vehicle delays, travel time and injuries by improved traffic control, often where STOP signs are inappropriate, i.e., due to traffic volumes, intersection configuration, and other such factors.	0-20 years	\$110,000,000	Estimate of installing a mix of 10 new signals and/or flashing beacons every other year and 1,500 new signs per year.																												
CN-SG06	<b>SFgo (Program)</b>	This citywide intelligent transportation management system gathers and analyzes real-time information on current transit and auto traffic flow and congestion; responds to changes in roadway conditions; provides transit priority and emergency vehicle preemption; disseminates real-time traveler and parking information to the public; facilitates the management of special events; and enhances day-to-day parking and traffic operations. It will significantly improve obsolete and deteriorating traffic signal communications facilities and will implement a number of Intelligent Transportation System (ITS) technologies.	The SFgo Program will expand and replace obsolete and deteriorating traffic signal communications facilities and provide real-time information on current transit and auto traffic to improve transit flow and reliability.	0-20 years	\$231,800,000	<table border="1"> <thead> <tr> <th>SFgo Infrastructure</th> <th>Cost</th> </tr> </thead> <tbody> <tr><td>Fiber Category Total</td><td>\$57,900,000</td></tr> <tr><td>Network Category Total</td><td>\$74,000,000</td></tr> <tr><td>TSP Category Total</td><td>\$74,000,000</td></tr> <tr><td>VMS Category Total</td><td>\$13,000,000</td></tr> <tr><td>CCTV Category Total</td><td>\$4,000,000</td></tr> <tr><td>Other Category Total</td><td>\$8,900,000</td></tr> </tbody> </table>	SFgo Infrastructure	Cost	Fiber Category Total	\$57,900,000	Network Category Total	\$74,000,000	TSP Category Total	\$74,000,000	VMS Category Total	\$13,000,000	CCTV Category Total	\$4,000,000	Other Category Total	\$8,900,000														
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CN-SG07	<b>Transit Only Red Lane Replacement</b>	This need covers the ongoing replacement and renewal costs of the SFMTA Transit Only Red Lanes. This assumes that 12 new miles of red lanes will be built every five years as well as a 20% contingency of cost escalation every five years.	Transit Only Red Lanes improve transit travel time and reliability for Muni riders. Timely replacement of these transit only red lanes ensures that they may serve their intended purpose.	0-20 years	\$49,800,000	Based on needs identified by the agency's State of Good Repair database and staff assessment.																												

**Transit Fixed Guideway Capital Program**

CN #	Name	Description	Justification	Timeline	Total Capital Need <i>(constant 2019 dollars, rounded)</i>	Cost Information & Calculation Methodology
CN-TF01	<b>Cable Car Infrastructure State of Good Repair (Program)</b>	Covers a wide variety of cable car infrastructure needs. Projects include: upgrades to the cable car barn; turntable rehabilitation at Powell and Market, Victoria Park, and Bay and Taylor; track switch replacement; safety upgrades; tangent track/slot replacement; depression beam replacement; crossover installation at Powell and Market; cable rewinder and holdback replacement; cable propulsion upgrade; and other projects as needed.	To replace track work, machinery, and communications equipment improve overall safety and increase the likelihood of attaining operational performance standards by providing updated and modern equipment which cable cars utilize.	0-20 Years	\$261,400,000	Estimate based on past similar work.
CN-TF02	<b>J-Line</b>	Market & Church to 20Th St, 22nd to 30Th, and 30TH/Randall to Ocean/San Jose including boarding islands and special trackwork.	The J-Line is an important part of the Muni transit network. The state of good repair of this railway ensures that trains may continue to run in a timely and efficient manner and provide maximum comfort for Muni customers.	0-10 years	\$190,000,000	Estimate based on past similar work.
CN-TF03	<b>K &amp; M-Lines</b>	One project is to replace approximately 1 mile of worn tangent track, trolley wire and trolley poles for the M-Line from Broad/Plymouth to San Jose/Ocean including curved tracks located at San Jose/Broad, San Jose/Farallones, San Jose/Mt. Vernon & Niagara; single crossovers at San Jose/Niagara and at Broad/Plymouth; turnouts at San Jose/Ocean(1), San Jose/Seneca(1), San Jose at Cameron Beach Yard (2); updating 4 low level boarding islands and 1 key stop; construct 1 new key stop; and new street lighting, traffic signals, ADA improvements, water and sewer upgrades. The other project is to replace about a half mile of worn tangent track, trolley wire and trolley poles on West Portal Ave from Ulloa to 15th Ave. Updating 2 boarding islands and street lighting, traffic signals, ADA improvements, water and sewer upgrades will also be encompassed by this project. This scope may change if other locations become a higher priority to be addressed instead of those listed here as informed by ongoing inspection and analysis.	The K- and M-Lines are an important part of the Muni transit network. The state of good repair of this railway ensures that trains may continue to run in a timely and efficient manner and provide maximum comfort for Muni customers.	10-15 Years	\$160,000,000	Based on the 2017 2-Year Plan with a 5% per year increase to 2019.
CN-TF04	<b>N-Line Rail Replacement between Arguello/Carl and La Playa</b>	This project is to replace 3.5 miles of worn tangent track, trolley wire and trolley poles for the N-Judah LRV line west of Arguello and Carl. Replace special trackwork including: Curved track located at Arguello/Carl, 9th/Irving, 9th/Judah, and La Playa/Judah; Single crossovers at 20th/Judah, 37th/Judah, 48th/Judah; Turn out track at 30th/Judah; Spur track at La Playa/Judah; Updating 26 boarding islands, street lighting, traffic signals, ADA improvements, water and sewer upgrades will also be encompassed by this project. This scope may change if other locations become a higher priority to be addressed instead of those listed here as informed by ongoing inspection and analysis.	The N-Line is an important part of the Muni transit network. The state of good repair of this railway ensures that trains may continue to run in a timely and efficient manner and provide maximum comfort for Muni customers.	5-10 years	\$260,000,000	Based on the 2017 2-Year Plan with a 5% per year increase to 2019.
CN-TF05	<b>Rail State of Good Repair (Program)</b>	Provides for the phased design and replacement of the trackway and related systems serving the light rail lines. Projects under this program include rail replacement, rail grinding, switch machine replacement, special trackwork replacement, track fastener replacement, tunnel infrastructure repairs and replacement, train signal upgrades, other electrical and mechanical improvements, and other work required to maintain non-traction power rail infrastructure. This program includes construction projects and a proactive replace in kind program for smaller projects.	The primary focus of this program is to maintain the light rail and cable car trackways in a state of good repair by replacing components that have reached the end of their useful life.	0-20 years	\$210,000,000	Estimate based on past similar work.
CN-TF06	<b>Muni Metro Station Enhancements</b>	Provides for the replacement of existing signage (wayfinding, station identification, passenger information), new painting, lighting and seating, construction of 15 new station agent booths, and other state of good repair needs.	This project will enhance the customer experience and address critical capital maintenance needs for stations.	0-20 years	\$40,000,000	Based on estimate from the SFMTA Maintenance of Way Team.

CN #	Name	Description	Justification	Timeline	Total Capital Need <i>(constant 2019 dollars, rounded)</i>	Cost Information & Calculation Methodology
CN-TF07	<b>Subway System State of Good Repair (SOGR)</b>	Subway systems such as lighting, equipment room upgrades, ventilations, architectural and structural upgrades, Fire Life safety equipment and emergency ventilation system	The primary focus of this program is to maintain the subway in a state of good repair by replacing components that have reached the end of their useful life.	0-20 years	\$88,500,000	Estimate based on past similar work, using Central Subway contract pricing.
CN-TF08	<b>Automatic Train Control System Wiring Replacement</b>	Replacement of critical ATCS wiring components. This work includes replacement of ATCS VCC to SCS, axle counter wiring, and intrusion wiring. Wiring upgrades at Van Ness and MMT are occurring but Duboce, Castro, Embarcadero, Montgomery, Powell and Civic Center are still needed.	A proper functioning ATCS is vital to the day-to-day operations of the San Francisco transit system. Without the ATCS trains in the Muni Metro Tunnel would be required to operate manually which increases travel time and reduces overall capacity of the Muni Metro Tunnel and the overall Muni System. Muni Metro travel time reliability is directly reliant on a functional ATCS.	5-10 Years	\$24,000,000	Estimate based on past similar work.
CN-TF09	<b>Train Control System Upgrade</b>	Design and procure a next generation communications-based train control system for the surface and/or the subway rail network.	With new CBTC systems, the exact position of a train is known more accurately than with current signaling systems, resulting in a more efficient and safe way to manage LRV traffic. A new CBTC system will permit an increase in headways while maintaining or even improving safety. CBTCs can include high-resolution train location determination, independent from track circuits; continuous, high-capacity, bidirectional train-to-wayside data communications; and train borne and wayside processors capable of implementing Automatic Train Protection (ATP) functions, as well as optional Automatic Train Operation (ATO) and Automatic Train Supervision (ATS) functions.	0-20 Years	\$160,900,000	Estimate based on past similar work.
CN-TF10	<b>Overhead and Traction Power System Rehabilitation (Program)</b>	Provides for the rehabilitation, replacement, and improvement of all components of the existing Muni overhead catenary system (OCS) and traction power infrastructure to support electrically-powered trolley coaches, light rail vehicles, and historic streetcars. This includes overhead wires, support poles, switches, substations, feeders, related hardware, underground infrastructures, communications, power cables, and SCADA.	The primary focus of this program is to maintain the overhead system in a state of good repair by replacing components that have reached the end of their useful life.	0-20 Years	\$60,000,000	Based on the 2017 2-Year Plan with a 5% per year increase to 2019.
CN-TF11	<b>Substation State of Good Repair</b>	The substations of West Portal, Laguna Honda, Church, Civic Center, Carl, Bryant, Station J, Judah, Outer Mission, Taraval, and Downtown are close to or beyond their design lives.	This program will update the aging traction power substation to improve the reliability of the system which is important in maintaining Muni rail service in a state of good repair in order to continue to serve our customers. The substations are a critical component of our system as they provide the power to operate the zero-emissions trolley and Light Rail systems.	0-10 Years	\$224,000,000	Based on the 2017 2-Year Plan with a 5% per year increase to 2019.
CN-TF12	<b>Cameron Beach Reconstruction of trackwork including pull in and pull outs, and yard grading</b>	This project is intended to raise the elevations of the Cameron Beach Yard, involving major structural, foundation and earthwork; replacing the north and south ladder tracks, tangents tracks, track switches, frogs and closure rails. Traction power and worn OCS trolley wires, poles, foundations, special work, various other OCS components at the Cameron Beach Rail Yard will also be replaced to accommodate the new yard elevations.	This work at the Cameron Beach yard is necessary to provide a more efficient path of travel for train accessing the facility supporting Muni rail service in a state of good repair.	10-20 Years	\$76,000,000	Based on the 2017 2-Year Plan with a 5% per year increase to 2019.

**Transit Optimization & Expansion Capital Program**

CN #	Name	Description	Justification	Timeline	Total Capital Need <i>(constant 2019 dollars, rounded)</i>	Cost Information & Calculation Methodology
CN-TO01	<b>Muni Subway Expansion Project</b>	The proposed project would: 1) Construct new light-rail tunnel between West Portal and Parkmerced to improve the Muni Metro M-line's speed, reliability, and capacity; 2) Re-design 19th Avenue between Eucalyptus and Brotherhood with wider sidewalks, a bike path separated from traffic, and new trees and landscaping.	These improvements are anticipated to make Muni Metro a more reliable and attractive option for existing riders and attract new riders. These improvements are also anticipated to make 19th Avenue feel safer and more comfortable for everyone who travels along this street, including people walking, cycling, driving, and riding transit.	10-20 years	\$3,000,000,000	Estimate based on past similar work, including contingency.
CN-TO02	<b>Better Market Street</b>	Includes planning, conceptual engineering, environmental review, public outreach and construction of the Better Market Street Project. Scope will include enhancements to urban design of sidewalks and boarding islands, transit facilities and operations, pedestrian facilities (e.g., crosswalks), new traffic signals, and bicycle facilities. The project area is roughly bounded by blocks just north of Market St., Mission St., Octavia Blvd. and Steuart St.	This project will improve the quality of the public realm and optimize sustainable mobility modes (transit, walking and cycling), so that they are pleasant, reliable, efficient and comfortable for all users.	0-5 years	\$730,000,000	Cost of the SFMTA elements of the scope of work: \$ 730,000,000 (Cost of whole project including elements from the Public Utilities Commission and the Department of Public Works: \$1,300,000,000).
CN-TO03	<b>Historic Street Car Expansion</b>	Consists of two separate projects. One project creates a northern terminal that consists of an independent E-Line track loop & terminal that allows for operational independence of the F-Line, including layovers, from E-Line service. The second project extends the current terminal west from Fisherman's Wharf to the Fort Mason Center through an abandoned railroad tunnel underneath Fort Mason. The E-Line would likely operate along this extension. The F-Line extension would cost approximately \$80M, and the E-Line track loop would cost approximately \$10M.	A northern terminal is needed to provide the operational flexibility required for overlapping E-Line and F-Line services. A Fort Mason terminal provides access to Fort Mason and areas to the west, which have limited transit access options.	5-10 years	\$95,400,000	The F-Line extension would cost approximately \$80,000,000, and the E-Line track loop would cost approximately \$10,000,000, plus 6% escalation to 2019.
CN-TO04	<b>Geary Boulevard Improvement Project</b>	The Geary Boulevard Improvement Project would implement transit and safety improvements along Geary Boulevard between Stanyan Street and 34th Avenue, including new transit-only lanes, upgraded bus stops, traffic signal upgrades, and pedestrian safety improvements. Transit only lanes would be installed in a new center-median between Arguello and 28th Avenue, and on the side of the street next to the parking lane between 28th Avenue and 34th Avenue.	This project would increase pedestrian safety, service reliability, passenger comfort and attractiveness and reduce travel time along the corridor.	0-10 years	\$240,000,000	Estimate based on past similar work, including contingency.
CN-TO05	<b>Geary Rail Transit</b>	Constructs a high capacity rail line along Geary Boulevard/Geary Street to provide increased speed, reliability, and capacity for this major transit corridor. This corridor will be considered for prioritization in the SF Transit Corridors Study and was previously identified in the Four Corridors Plan, the Rail Capacity Strategy, and the Subway Master Plan.	This project will provide a higher capacity service along the corridor, providing passengers with improved speed, reliability and comfort.	10-20 years	\$3,030,000,000	Estimate of \$1,400,000,000 - \$3,030,000,000 from the SFMTA Rail Capacity Strategy, published in 2016
CN-TO06	<b>Geneva Avenue Light Rail Transit Extension</b>	Entails extending light rail track 2.7 miles along Geneva Avenue from the Green Railyard to Bayshore Boulevard and then to the existing T-Third terminus at Sunnysdale Station. Operations would occur at-grade with station locations to be determined.	This project would provide for the operational flexibility needed to meet long-term rail service needs.	10-20 years	\$610,000,000	Estimate based on past similar work, including contingency.
CN-TO07	<b>Geneva/Harney Avenue Bus Rapid Transit</b>	This project consists of two phases: an initial phase east of Bayshore/Arleta and a future phase west of Bayshore/Arleta. The initial Phase provides exclusive bus lanes, transit signal priority, and high-quality stations along Tunnel Avenue, Beatty Avenue, Alana Way, Harney Way, and Crisp Avenue, and terminating at the Hunters Point Shipyard Center. The future Phase provides the continuation of exclusive bus lanes, transit signal priority, and high-quality stations west to Santos St., connecting with Muni Forward transit priority improvements. This near-term alternative does not rely on the full extension of Geneva Avenue across US 101 to Harney Way. The project also includes pedestrian and bicycle improvements in support of Vision Zero.	This project will provide new and expanded transit capacity to accommodate new development growth areas, reduce transit travel time and improve transit reliability. The project will provide service on a corridor that connects regional transit services, Priority Development Areas, and the Candlestick Point/Hunters Point Shipyard Development.	5-10 years	\$68,100,000	Estimate based on past similar work, including contingency for the section east of Bayshore/Arleta.

CN #	Name	Description	Justification	Timeline	Total Capital Need <i>(constant 2019 dollars, rounded)</i>	Cost Information & Calculation Methodology
CN-TO08	<b>Muni Forward Capital Projects</b>	Muni Forward aims to make getting around San Francisco safer and more reliable by creating a Rapid Network, improving reliability, using state-of-the-art technology to make the system run better, and enhancing safety and access to stops and stations. Muni Forward transit priority projects on the Rapid Network may include adding bus or pedestrian bulbs, transit-only lanes, transit signal priority, and other street design changes to reduce delay for transit and enhance pedestrian safety. The first phase of Muni Forward is already underway, with a 10% service increase in place and over 40 miles of transit priority improvements on the way. During the next phase of Muni Forward transit priority projects, priority will be given to lines 1, 5, 7, 8, 22, J, K, M and N, then to lines that have high existing or projected ridership and Equity Strategy lines, such as the 24, 29, 43, and 44.	The improvements result in greater transit travel time reliability and on-time performance. Improved reliability and on-time performance should also result in decreased operational resource needs.	0-10 years	\$300,000,000	Estimate based on past similar work, including contingency, for over 40 miles of improvements.
CN-TO09	<b>Bayshore Multimodal Facility</b>	The project would construct support facilities to improve transfers near the Caltrain Bayshore Station among Caltrain, the T-Third line, the future Geneva Harney BRT, Muni 8 Bayshore and 9 San Bruno lines, SamTrans bus service, and employee/community shuttle buses and vans. This project would also improve pedestrian/bicycle access to and passenger loading near the Caltrain Bayshore Station. Facilities would include: shuttle/auto passenger loading space and shelters, bicycle parking, bicycle sharing facility, street furniture, landscaping, a plaza, wayfinding signs, information displays and possibly a bicycle/pedestrian path. In the initial stage, the facility would be sited near the Sunnydale Avenue extension east of Bayshore Boulevard being constructed by the Schlage Lock development project. In a potential second phase, this facility could be expanded or even partially relocated to a nearby location to improve Caltrain connections with BRT and T-Third service. In this later phase, vertical and horizontal circulation improvements, ticket/information facilities, and an enclosed waiting area could be added. The project would be closely coordinated with the Schlage Lock and Brisbane Baylands development projects as well as other projects in the area.	This project improves connectivity and enhances transit travel options for residents and employees of southeast San Francisco, supporting major planned transit-oriented development and affordable housing. It would address current limited connections between Caltrain, the T-Third light rail line, Muni bus lines and surrounding neighborhoods. It would also support efforts to increase Caltrain service at this station, which will increasingly serve as a major regional transit connection with planned growth and Caltrain electrification.	5-10 years	\$22,000,000	Estimate based on past similar work, including contingency.
CN-TO10	<b>T Third Phase 3 to Fisherman's Wharf</b>	Provides for the study and extension of the T Third rail line approximately 1 mile north, from the planned Central Subway terminal at Stockton/Clay through North Beach and into Fisherman's Wharf. Alternatives under consideration also include a possible continuation one mile westward toward the Marina and Cow Hollow. This project will provide a higher capacity service along the corridor, introducing improved speed, reliability and comfort.	Extension would connect Fisherman's Wharf and North Beach, a regional trip generator and one of the densest neighborhoods in San Francisco, with efficient and reliable rapid transit service. Continuation to the Marina and Cow Hollow would further the reach of the subway into areas where surface congestion presents challenges for bus service.	10-20 years	\$2,000,000,000	Estimate based on past similar work, including contingency, ranging from \$643,000,000 - \$2,600,000,000.
CN-TO11	<b>Accessible Light Rail Stops (Program)</b>	Design and construct 20 new accessible light rail stops at 10 locations that have been identified in the Accessible Key Stop Feasibility Study (M679.0), then continue with other feasible, high-priority locations as they are identified. Accessible platform locations on the J Line have been identified as high priority locations (OB platform on San Jose & Nantucket; IB platform on San Jose Ave & San Juan). The program will also replace the wayside lift at San Jose & Geneva with a ramp and platform.	This project will improve passenger access to light rail transit, particularly for people with mobility impairments.	10-20 years	\$30,400,000	Estimate based on past similar work; 20 accessible light rail stops at approximately \$1,500,000 per stop, plus escalation.

CN #	Name	Description	Justification	Timeline	Total Capital Need <i>(constant 2019 dollars, rounded)</i>	Cost Information & Calculation Methodology
CN-TO12	<b>Accessible Stop Spot Improvement Program</b>	Implement small light rail and bus and stop improvements to improve accessibility for persons with disabilities. Improvements could include: repair/replacement of damaged railings, signage and attenuators at Key Stops; installation of NextMuni/Push-to-Talk at transit shelters; improving crosswalks and installing or upgrading curb ramps adjacent to transit stops.	This project will improve passengers' access, wayfinding, and safety to transit stops, particularly for people with mobility impairments.	10-20 years	\$2,100,000	Estimate based on past similar work.
CN-TO13	<b>Transit Stop Boarding Islands and Features (Program)</b>	This includes the costs of installing activated beacons, leaning bars, and NextMuni signs at 80 mini-high platforms as they are reconstructed towards the end of their useful life.	Provide a safe and accessible transit system by keeping assets in a state of good repair. Enhance the customer experience.	10-20 years	\$500,000	Estimate based on past similar work.
CN-TO14	<b>Raised or protected trackways on Muni Metro light rail surface lines</b>	Create semi-elevated or protected rights of way on most surface segments of Muni Metro lines, similar to existing treatments on Judah Street between 9th and 19th avenues, and the T Third line on Third Street. Areas for upgrades would include the J Church on San Jose Avenue; the K Ingleside on Ocean Avenue; the M Oceanview on West Portal Avenue and San Jose Avenue; and the L Taraval on Taraval Street.	Existing light rail lines are subject to delay due to mixed traffic operations on the surface portions of their routes. This project would fully separate the routes from traffic, allowing for more reliable transit service on some of Muni's most heavily used lines.	10-20 years	\$300,000,000	Estimate based on past similar work.
CN-TO15	<b>Three-car trains in the Muni Metro Tunnel and on the N Judah</b>	Muni will introduce the use of 3-car light rail trains in the Muni Metro Tunnel between West Portal and Embarcadero, and on the N Judah line. Work will entail lengthening existing platforms and other engineering improvements to accommodate longer trains.	This will increase capacity by 50% on the most crowded portion of the Muni Metro network, reducing crowding and supporting increased ridership as travel demand grows in the future.	10-20 years	\$80,000,000	Estimate based on past similar work.
CN-TO16	<b>Muni Metro Subway Enhancements</b>	This program will implement enhancements to the Muni Metro system that will allow four-car trains to operate from the Embarcadero to West Portal at high frequencies. Program elements will include upgrades to switches, crossovers and other components to increase subway throughput, as well as modifications to subway portals to minimize conflicts that cause delay in the subway. These enhancements will also include surface signaling upgrades that will ensure trains entering the subway are evenly spaced and enter the subway with minimal delay. As a result of these upgrades, Muni will be able to provide greatly increased capacity and reliability throughout the Muni Metro system.	This project will increase capacity in the Muni Metro tunnel and will improve reliability throughout the Muni Metro system by eliminating chokepoints and upgrading infrastructure that allows for improved coordination across the Muni Metro system.	0-10 years	\$30,000,000	Cost is based on recent experience with Muni Forward projects of a similar scale
CN-TO17	<b>Muni Forward next generation</b>	The next generation of Muni Forward transit priority treatments will build on the success of current improvements to deliver an even higher standard of reliability. Through a range of capital improvements, such as transit-preemption signals and additional dedicated right-of-way, Muni will provide Rapid service that travels between stops with very few if any delays. Improvements will be targeted to the Rapid Network as well as other high-priority lines identified in the Equity Strategy or based on ridership trends.	This project will deliver travel time and reliability benefits above and beyond what has been accomplished to date. Improving these metrics is critical to continuing to attract riders in the future as San Francisco's population grows and other modes of travel increase in availability and affordability.	5-15 years	\$500,000,000	Estimate based on past similar work.
CN-TO18	<b>Transit Signal Priority</b>	Purchase and deploy Transit Signal Priority (TSP) devices and communications equipment for intersections on the Muni Bus and Rail network. The project includes capital equipment and associated costs, including: vehicle detection loops, conduit, cabinets, controllers and electrical wiring (rail); cabinets, controllers, wireless communication and associated hardware (bus).	Transit signal priority has proven to improve travel time and service reliability for Muni riders.	0-10 years	\$29,000,000	Estimate based on past similar work.