

# 2016 ANNUAL STATE OF GOOD REPAIR REPORT



**Sustainable Streets Division Planning Section**  
Capital Planning and Asset Management



**SFMTA**  
Municipal  
Transportation  
Agency

# Executive Summary



State of Good Repair refers to the condition in which an Agency's capital assets are able to operate at a full level of performance. Maintaining a State of Good Repair (SGR) is a fundamental priority in order to provide safe, efficient, and accessible services to San Francisco.

The San Francisco Municipal Transportation Agency's 2016 State of Good Repair Report provides an overview of the agency's rehabilitation and replacement needs and investments. It also outlines the agency's asset management, project delivery, and investment prioritization practices related to maintaining a State of Good Repair.

This is the fourth comprehensive State of Good Repair (SGR) Report published by the SFMTA and aims to track the progress of SGR investments and asset management practices compared to previous reporting periods. This document builds directly upon the 2015 State of Good Repair Report - which utilized a similar methodology to determine asset condition and project future SGR needs - and provides updated needs that reflect changes in costs due to inflation and capital asset inventory changes.

The 2016 State of Good Repair Report focuses primarily on the current State of Good Repair for SFMTA assets and the agency's plans for improving SGR over the next five years.

The SFMTA will continue to publish a State of Good Repair Report annually to reflect the agency's progress in maintaining a State of Good Repair.



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# THE SFMTA

## Who we are

The San Francisco Municipal Transportation Agency (SFMTA), a department of the City and County of San Francisco, is responsible for the management of all ground transportation in the city. The SFMTA was established in 1999 with the passage of Proposition E, which amended the city charter to merge the San Francisco Municipal Railway (Muni) with the Department of Parking and Traffic (DPT), creating an integrated transportation agency to manage city streets more effectively and advance the city's Transit First policy. The SFMTA continued to evolve after merging with the Taxi Commission in March 2009. The Agency is governed by a Board of Directors, which is appointed by the Mayor and confirmed by the San Francisco Board of Supervisors. The SFMTA Governing Board provides policy oversight for the Agency, including approval of its budget, contracts, and changes of fares, fees, and fines to ensure that the public interest is represented.

## What we do

The SFMTA plans, designs, builds, operates, regulates and maintains one of the most comprehensive transportation networks in the world. The agency directly manages five types of public transit in San Francisco (motor coach, trolley coach, light rail, historic streetcar and cable car) and promotes other forms of transportation including walking, bicycling, taxi and auto use. The SFMTA also manages a para-transit service for those unable to use fixed-route transit options, regulates the taxi industry, and oversees on- and off-street public parking spaces.

The SFMTA has robust planning, design, and construction functions that support all elements of the city's transportation infrastructure. We provide long-range forecasts for the Agency's fleets and facilities, the city's public rights-of-way, and the transportation impacts of proposed land use developments with private developers and other partners. The SFMTA also partners with other city and regional agencies to define long-range transportation, housing and equity goals. By performing these multiple essential functions, the SFMTA directly touches every person who lives, works in or visits San Francisco, and positively impacts regional efforts to achieve California's climate and sustainability goals, quality of life and economic vitality.



## State of Good Repair (SGR) Commitment

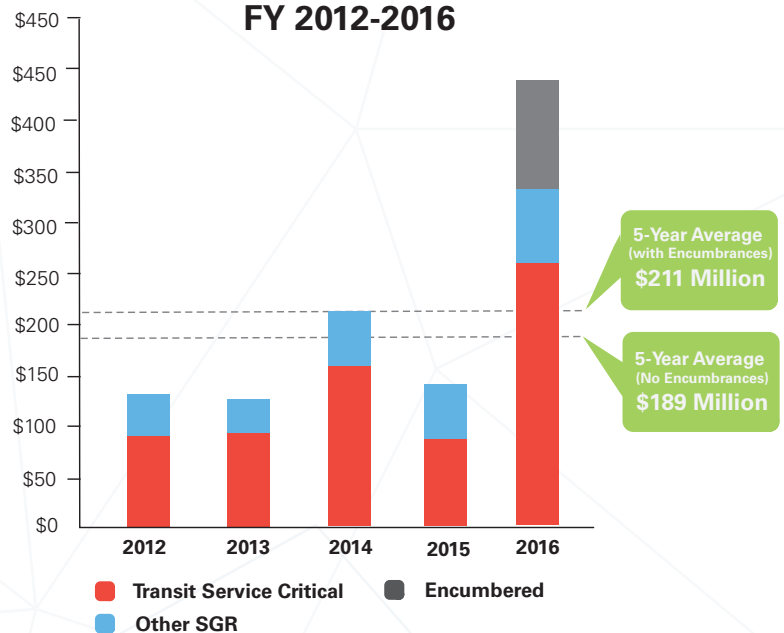
The SFMTA is committed to maintaining its transportation infrastructure in a State of Good Repair. SGR refers to the condition in which an Agency's capital assets are able to operate at a full level of performance. Because the SFMTA operates in a fiscally constrained environment, the agency must balance SGR needs with operations, enhancement, and expansion priorities. Deferred needs are categorized as the Agency's backlog.

The SFMTA has committed to investing an average of \$250 million annually on State of Good Repair. This commitment was made to the Federal Transit Administration (FTA) in 2010 as part of the full funding agreement for the Central Subway Project.

These funds are primarily directed towards "Transit Service Critical" investments and are distributed across many of the SFMTA's 11 Capital Programs; they are also balanced between upcoming SGR needs and addressing the backlog of deferred SGR needs.

The agency's \$250 million annual investment goal is intended to ensure that the SFMTA balances its resources effectively between maintaining a state of good repair and continuing to enhance and expand the transportation system.

## SGR Annual Investment (\$M) FY 2012-2016



Since 2012, the SFMTA has invested an average of \$189 million annually on State of Good Repair. This figure includes dollars currently encumbered in contracts. If annual investments match the current planned investment levels, the agency will meet its \$250 million annual commitment within the next five years.



# OVERVIEW CONCEPTS

## Asset Management Program

The SFMTA's Asset Management Program has established a Transportation Asset Management Policy and set forth goals consistent with the Federal Transit Administration's requirements for the National Transit Asset Management System established under Moving Ahead Progress in the 21st Century (MAP-21) Act and affirmed in the Fixing America's Surface Transportation (FAST) Act. The establishment of this national effort supports the asset management practices being developed locally at the SFMTA.

The SFMTA's Asset Management Goals are:

1. Develop policies, processes, data, and analytical tools to manage all assets.
2. Systematically and efficiently maintain, renew, and extend the life of transportation assets.
3. Provide the City with a safe, reliable, high performing and cost effective transportation system.

The foundation of the Asset Management Program is the capital asset inventory. Since 2009, the agency has maintained an asset inventory to provide a single, comprehensive account of the agency's capital assets.

The Asset Management Program incorporates information from the capital asset inventory to inform decision making during the capital planning process.

## Capital Planning Process

There are several long-range planning documents that capture the agency's need for capital investments, including the **20-Year Capital Plan** and the **5-Year Capital Improvement Program (CIP)**. These planning documents serve to meet the goals of the agency's **FY 2013-2018 Strategic Plan**

The **20-Year Capital Plan** is an assessment of the SFMTA's anticipated capital needs for the upcoming 20 years. It is a financially unconstrained document, meaning that it includes capital needs where funding has not yet been committed. The purpose of the Capital Plan is to identify and prioritize all of the agency's potential capital investments needed to achieve the city's transportation goals. It also provides the foundation for developing the fiscally-constrained **5-Year Capital Improvement Program (CIP)** and the **2-Year Capital Budget**. A Capital Project must be included in the **20-Year Capital Plan** to be eligible for inclusion in the **5-Year Capital Improvement Program**.

The most current Capital Plan, which is formally updated every two years, was adopted by the SFMTA Board in September 2015. The current Capital Plan identifies over \$21.4 billion in potential SFMTA capital investments over the next 20 years. Of this total, \$11.7 billion is needed over the next 20 years for the ongoing replacement and restoration of the agency's existing assets.



The agency's **5-Year Capital Improvement Program (CIP)** is a fiscally constrained program of capital projects that is organized into 11 Capital Programs: Communications/IT, Facility, Fleet, Parking, Security, Traffic/Signals, Streets, Taxi, Transit Fixed Guideway, Central Subway and Transit Optimization/Expansion.

The SFMTA is currently implementing the FY 2017-2021 CIP which was adopted by the SFMTA Board in July 2016. The FY 2017-2021 CIP includes 255 projects for a total investment of \$3.44 billion. This includes infrastructure investments, area plans and capital procurements and purchases. Of this \$3.44 billion, \$1.7 billion will be dedicated to SGR investments over the next five years. The FY 2019-2023 CIP is currently under development, and is anticipated to be adopted in the Spring 2018.

## Categorizing Investment Needs

At a high level, the SFMTA categorizes all assets into distinct asset classes, which were developed in 2009 as part of the first comprehensive capital asset inventory. Investment in these assets occurs via capital projects, which are sorted by Capital Program for capital planning purposes. To provide full transparency, this report will use both the Asset Class category and the Capital Program category to report upon SGR needs and investments.

The SFMTA also categorizes SGR needs by Transit Service Critical (TSC) and Other SGR. Transit Service Critical is defined as investments that are essential to ensuring the safe and reliable functioning of the transit system, such as maintaining or replacing overhead wires, rail track, or transit vehicles. Other SGR signifies investments that help to make the transportation network more comfortable, efficient, and enjoyable for riders, along with maintenance of non-transit assets related to pedestrian, bicycle, enforcement and administration.

### Investment needs categorized as asset classes and capital programs, prioritized into transit service critical and other State of Good Repair needs

	Asset Class	Capital Program
Transit Service Critical	Light Rail Vehicle Motor Coach Vehicle Overhead Catenary System Track Train Control & Comms Trolley Coach Vehicle Other Systems / Vehicles	Transit Fixed Guideway Fleet Communications / IT
	Facilities Parking & Traffic Stations Other Systems / Vehicles	Facility Streets Security Traffic & Signals Parking Transit Optimization / Exp
Non-SGR		Central Subway Taxi



# STATE OF GOOD REPAIR

## Defining State of Good Repair

State of Good Repair (SGR) refers to the condition in which an Agency's capital assets are able to operate at a full level of performance. The performance and condition of capital assets declines over time and requires regular rehabilitation and replacement to continue to operate in a State of Good Repair.

The SFMTA categorizes capital projects as State of Good Repair if they provide for the rehabilitation or replacement of existing transportation infrastructure. This definition excludes projects where the primary purpose is to enhance or expand the transportation network. However, new assets that are introduced to the transportation system through enhancement or expansion projects are added to the Capital Asset Inventory upon completion. This ensures that they will be included in future assessments of the agency's rehabilitation and replacement needs.

This report looks at the SFMTA's State of Good Repair through the perspective of SGR investments and SGR needs. SGR needs are determined by analyzing the condition, age, and replacement value of capital assets. SGR investments are determined by analyzing capital project scope and funding. These two perspectives provide a complete picture of the SFMTA's State of Good Repair.

In calculating annual SGR investment, the SFMTA analyzes planned expenditures at the Capital Program level. Some Capital Programs are entirely comprised of SGR investments; in these cases, the entirety of that Program is counted towards the SFMTA's \$250 million annual SGR commitment. Some Capital Programs are only partly comprised of SGR investments; the SFMTA must consider such programs on a project-by-project basis to determine which expenditures should be classified as SGR. At an even more fine-grained level, some individual projects may contain both SGR and non-SGR components. For example, Complete Streets projects such as Better Market Street combine the rehabilitation of existing assets with expansion and enhancement elements. This report is primarily based on Capital Program-level assumptions of SGR investments. Moving forward, the agency will continue to refine its calculation of SGR investments at a more fine-grained project level. This will require development of business processes to support linking SGR investments with the specific capital assets that are impacted by a given investment.

This document reports upon State of Good Repair investments that are made via SFMTA capital expenditures. It is important to note that the SFMTA operating budget, which funds Transit subdivisions such as Maintenance of Way, Bus Maintenance, and Rail Maintenance, provides





maintenance funds which allow assets to meet their useful life. Useful life is the expected life cycle of a capital asset or the acceptable period of use in service. Operating dollars also fund the SFMTA shops that are responsible for repair and maintenance of paint, parking meters, signs, and traffic signals. The daily work of these groups is essential to achieving the expected useful life of assets and avoiding service disruptions. Essential responsibilities include inspections, preventative maintenance, and asset component replacement. However, operating funds are not currently tracked as part of the SFMTA's calculation of SGR investments. The agency aims to create a system for tracking operating investments through the Asset Management Program.

The Agency's Asset Management Program is currently implementing an Enterprise Asset Management System which will support tracking operating investments and progress towards achieving a State of Good Repair. The Enterprise Asset Management System will serve the Agency as a dedicated maintenance management, materials management, and asset management system. This will provide the fine grained detail needed to understand the condition of our assets based on real-time maintenance assessments, accurate asset useful life values, and life-cycle costs of an asset. This information will be the foundation for decision making at an agency level and create

a comprehensive link between our investments and the condition of our system.

In conducting this 2016 SGR analysis, the SFMTA used the Transit Economic Requirements Model Lite (TERM Lite) analysis tool. TERM Lite has been developed by the U.S. Department of Transportation and is used to produce federal State of Good Repair and other infrastructure assessment reports. TERM Lite assists in evaluating the current SGR Backlog, forecasting future investment needs, and simulating different funding and prioritization scenarios.

The next section of this report will give a detailed summary of the SFMTA's 2016 TERM Lite analysis, along with steps for improving SGR estimates going forward.



# CAPITAL ASSET INVENTORY

## Background

The SFMTA kicked off its Capital Asset Management Program in 2009 with the development of its first comprehensive Capital Asset Inventory. The program was intended to support agency, regional, and nation-wide capital planning efforts. The resulting 2009 inventory reflected an extensive effort that engaged many SFMTA divisions in collecting asset information including age, replacement cost, and scheduled useful life. In total, the agency identified over 3,600 asset items in the 2009-2010 asset inventory process. This included transit-related assets such as track, overhead power systems, and rolling stock, as well as non-transit assets, such as parking infrastructure, traffic signals, and non-revenue vehicles. Completion of this initial inventory was supported by project consultants with later review and refinement by the region's Metropolitan Transportation Commission (MTC) and additional consultants. The 2009 inventory provided a foundation for the agency's first State of Good Repair Report in 2010.

Following the completion of the 2009 Inventory, the SFMTA identified several opportunities to improve the quality of its transportation inventory data, such as refining replacement cost estimates and adding previously undocumented assets to the inventory. The SFMTA worked with the Metropolitan Transportation Commission (MTC) to make these updates in 2011, which fed into the MTC's Regional Transit Capital Inventory (RTCI).

Starting in 2014, the SFMTA began the effort to update the Capital Asset Inventory on an annual basis. These annual updates include changes to capital assets, refining replacement costs, and ensuring asset records reflect completed Capital Projects within the fiscal year. Each year the Capital Asset Inventory becomes more refined and accurate. Changes in the Capital Asset Inventory are documented in each Annual State of Good Repair Report.

In 2016, the SFMTA updated the Capital Asset Inventory to reflect the completion of SGR-related projects between July 2015 and June 2016. The 2016 update reflects plans for new revenue vehicles, evaluation of how we are simulating needs related to parking assets, updating new facilities, and capturing recent projects to rehabilitate facility sub-systems.

Here is a summary of key improvements that the agency plans to implement in the upcoming years to improve the quality of the Capital Asset Inventory.

1. Include data on planned asset expansion projects such as the Central Subway.
2. Develop and implement the process to capture replacement and rehabilitation of assets in real time.
3. Integrate the inventory with the forthcoming Enterprise Asset Management System to improve Agency-wide asset management.



4. Refine unit replacement costs and develop process for keeping these values current.
5. Conduct risk assessments and multi-variable condition assessments for all assets to support more precise SGR evaluation and more data driven project prioritization.

## Changes made to the Capital Asset Inventory in 2016

- Updated new operator restrooms and removed some duplicate records to reflect final phases of the Operator Convenience Station project.
- Updated parking garage assets to reflect waterproofing and HVAC rehabilitation as part of the Facilities Capital Program.
- Retired old parking meter asset records and added new records based on the Parking Meter Replacement project
- Updated signalized intersection related records to more accurately reflect ongoing annual rehabilitation and replacement
- Updated revenue fleet records to reflect updated fleet planning documentation
- Updated escalator records based on the Phase 2 Escalator Replacement Project.



***The 2016 inventory contains 3,783 asset records***



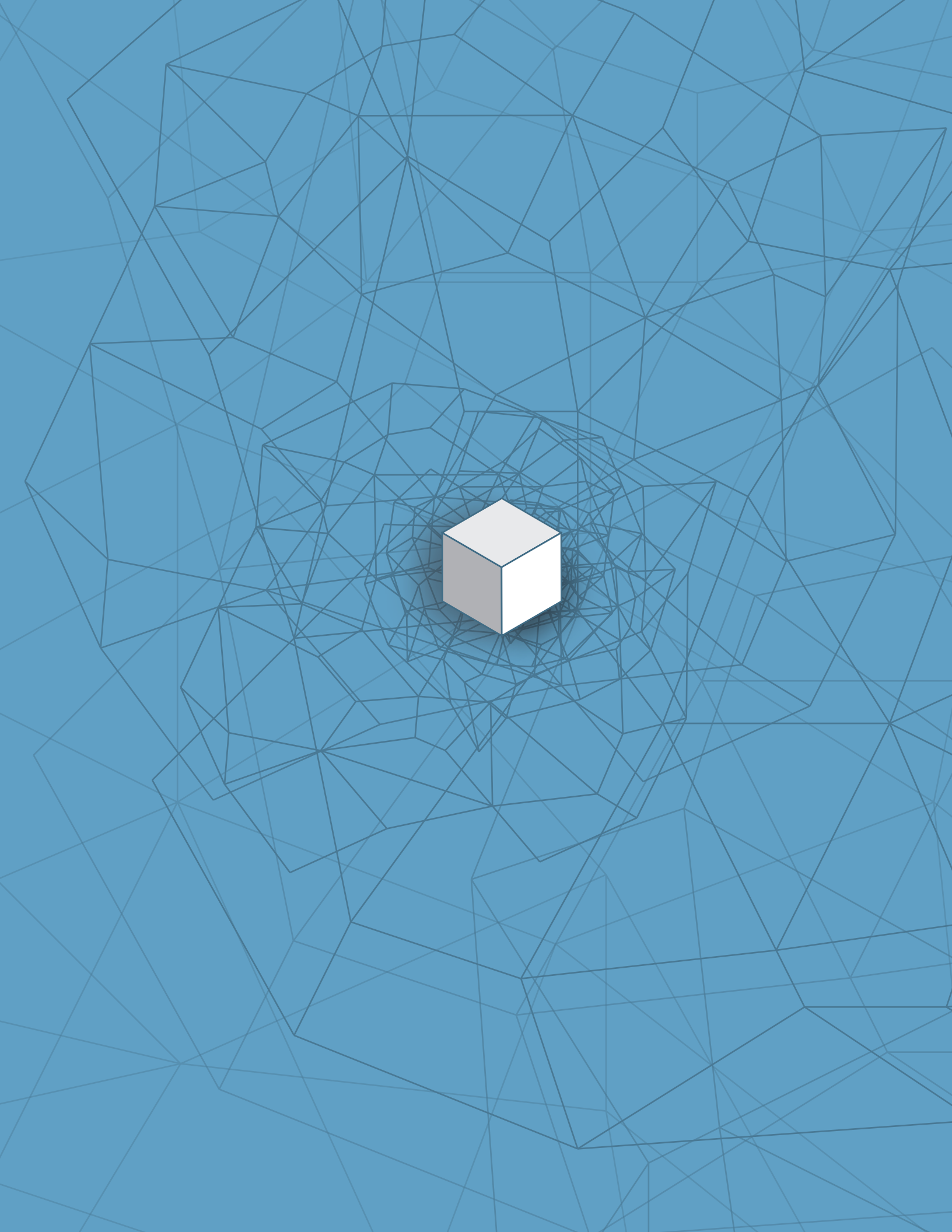
***The inventory identifies important details for each asset including replacement value, useful life, and commission date.***



***The inventory is updated through outreach and engagement with Agency project managers, operations staff, and financial analysts.***



***The Enterprise Asset Management System project, currently being implemented, seeks to provide a real-time asset inventory for the agency***





# State of Good Repair Needs Analysis



# 2016 STATE OF GOOD REPAIR ANALYSIS

## Overview

The 2016 State of Good Repair Report is based on the agency's 2016 Capital Asset Inventory. The SFMTA uses the Federal Transit Administration's TERM Lite modeling tool to calculate current and future SGR investment needs that reflect changes in the inventory, including those due to inflation, updated unit costs, and data improvement.

The TERM Lite tool is able to determine the level of investment required to maintain or improve asset condition, assess impacts of investment scenarios on asset condition, and simulate future needs determined by age-based asset decay formulas.

The output generated from the TERM Lite tool allows the SFMTA to conduct planning level analysis of the agency's capital needs over the next 20 years. TERM Lite uses an age-based methodology which shows an asset's condition score deteriorating as it reaches the end of its scheduled useful life and simulates mid-life rehab / replacement events. Moving forward, as the SFMTA implements the FTA's Transit Asset Management requirement, the agency will incorporate additional factors into condition scoring, moving beyond age-based condition scoring and incorporating condition assessment conducted by maintenance staff or deriving automated condition scores based on work conducted against an asset over time.

This refined condition scoring will support more precise SGR assessments and data-driven project prioritization. It will be supported by the development of the agency's Enterprise Asset Management System, which is due to be implemented agency-wide by 2020.

## State of Good Repair Figures

**Total Asset Replacement Value**

**Total Asset Backlog**

**Backlog by Asset Class**

**Asset Condition Scores**

**20-Year Investment Needs**

**SGR Investment Scenarios**

# Total Asset Replacement Value

The first step in calculating future investment need is to define the SFMTA's current total asset replacement value. The 2015 State of Good Repair analysis calculated a total asset replacement value of \$13.53 billion; that value increased to \$13.59 billion in 2016

The overall increase in total asset replacement value is primarily due to updates in unit replacement costs, data improvements, and inflation. For the most part, the overall Asset Value has not changed significantly from the past year. There were two noticeable changes from the 2015 report in the Facilities and Trolley Coach Asset Classes. In terms of facilities, staff changed the way that the Islais Creek Facility Project was represented in the inventory to reflect the full replacement value occurring when the second phase of the project is scheduled to be completed in 2018. This resulted in a lower replacement value for the 2016 report but doesn't impact the overall 20 year needs projections. The Trolley Coach fleet records have been updated to align with the most recent fleet planning documents, this updated our inventory to reflect recent vehicle retirement and replacement. This resulted in a lower total asset value for this Asset Class.

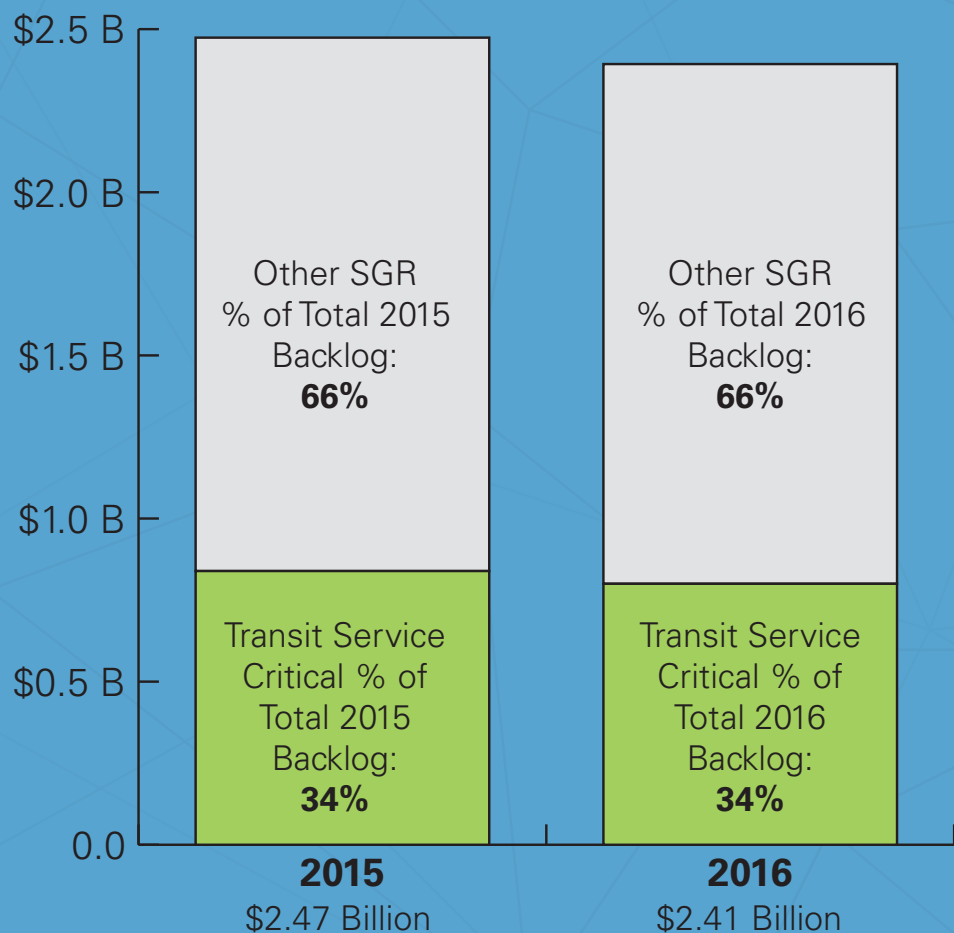


## Total Asset Backlog

To date, the SFMTA has not had the financial means to fully replace assets as they reach the end of their scheduled useful lives. The sum of these deferred replacement and rehabilitation needs represents the current SGR “backlog”. In other words, the backlog is equal to the value of all assets that are currently operating beyond their scheduled useful lives. It is important to note that scheduled useful life is an estimate of when an asset should be replaced based on manufacturer recommendations, FTA guidelines, and general transit agency experience. It does not account for specific operation conditions, level of use, or other factors that would adjust the anticipated useful life of an asset.

The backlog was estimated at \$2.47 billion in 2015 and decreased to \$2.41 billion in 2016. The backlog decrease is attributed to alignment of our capital asset inventory to updated transit fleet planning documentation and changes to how our parking and signalized intersections are represented in the inventory.

### SGR Backlog Comparison

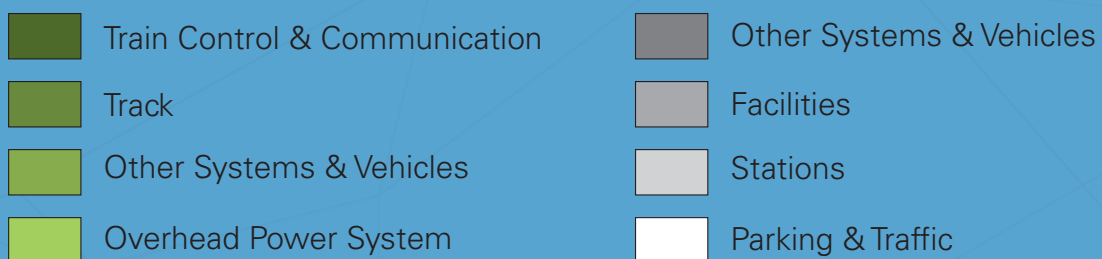
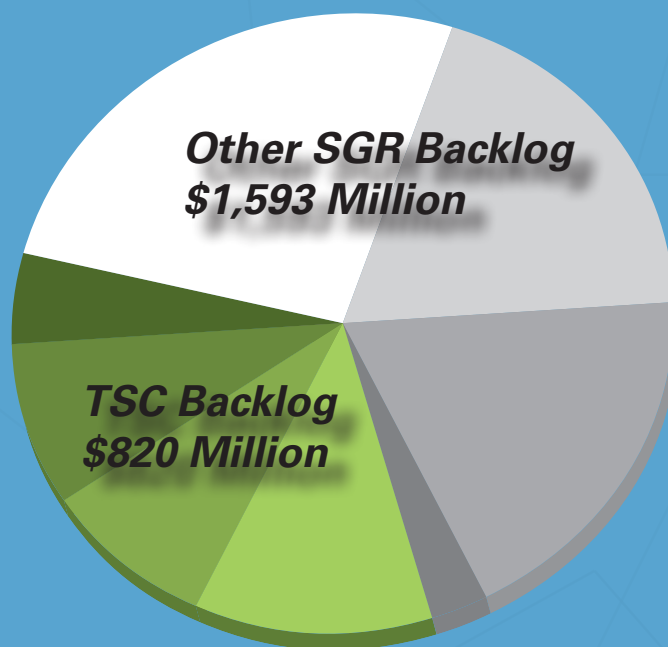




## Backlog by Asset Class

Analyzing the backlog by asset class provides a more detailed look at which assets will require increased investment in future years. This breakdown also reflects the agency's current prioritization of Transit Service Critical (TSC) assets, as TSC assets have \$800 million in unmet need compared to \$1.59 billion for "Other SGR" assets.

Viewing the backlog by asset class is important for contextualizing the asset condition scores that are on the following pages. Viewing the backlog by asset class presents an unweighted metric for which assets require the highest dollar-amount of investment. The three largest asset classes in the backlog are Parking & Traffic (\$627M), Stations (\$457M), and Facilities (\$440M), all of which are categorized as "Other SGR."



## Asset Condition Scores

In addition to calculating current and future investment needs for SFMTA assets, the 2016 TERM Lite modeling also produced a “condition score” for all assets in the Capital Asset Inventory. These condition scores are based on the scheduled useful life of each asset; they do not reflect specific operating conditions, level of use, or other factors that impact the performance and operating life of individual assets. Moving forward, the agency will incorporate use-based condition data to better model the condition of SFMTA assets.

The TERM Lite condition scores use a scale of 1 (poor) to 5 (excellent), with assets approaching zero as they reach the end of their scheduled useful life. The FTA defines State of Good Repair as maintaining a transportation system in which assets receive a score of 2.5 or better based on these classification rankings.

The Average Condition Score (ACS) for all SFMTA assets has decreased from 3.33 in 2015 to 3.32 in 2016. This can be attributed to high value, aging assets, within the facilities, station, non-revenue fleet and fixed guideway classes.

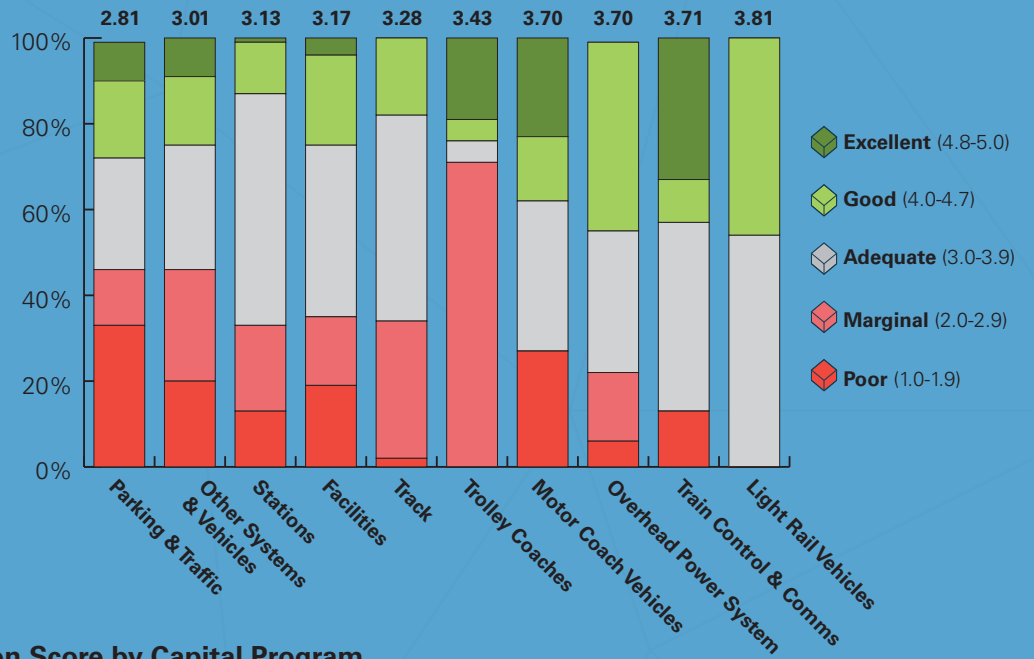
The Average Condition Scores by Capital Program shows areas for improvement within the Other Systems & Vehicles, Parking, and Facilities Programs. The Other Systems & Vehicles program consists primarily of non-revenue vehicle assets. The Parking and Facilities Programs are made up of assets that represent our parking garages, administrative and maintenance facilities. Many of these assets have passed the midpoint of their planned useful life value, which means the Agency will need to begin planning for significant rehabilitation or replacement.

The Average Condition Score by Asset Class shows our strong investment in our revenue fleet. A large percentage of the Trolley Coach fleet shows as marginal condition due to nearing the end of their useful life, however planned procurements will replace these vehicles over the next few years significantly increasing the condition in subsequent State of Good Repair Reports. Identified in the lowest four asset classes are investment needs related to facilities, Muni Metro stations, parking garages, and non-revenue fleet.

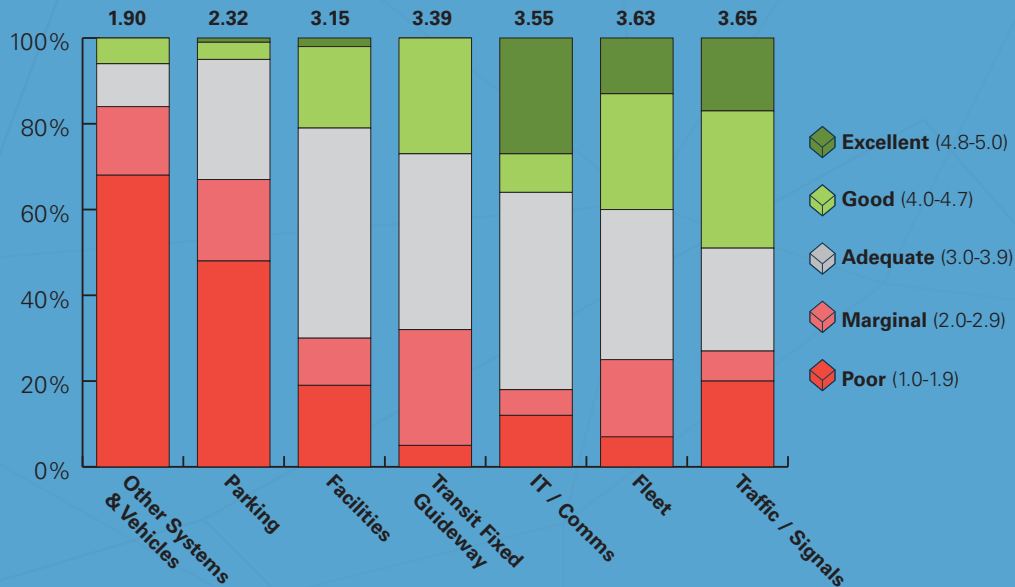
### Age-Based Condition Score - Overview



### Age-Based Condition Score by Asset Class



### Age-Based Condition Score by Capital Program



## 20-Year Investment Needs

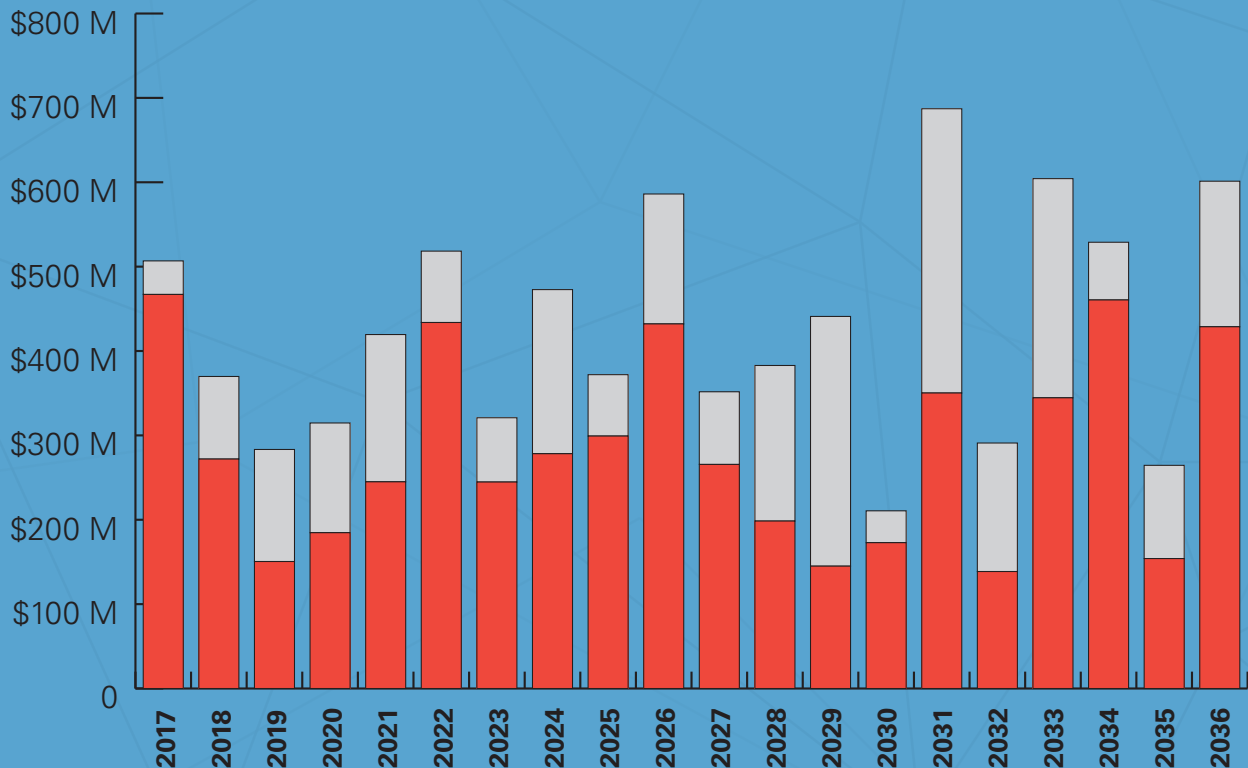
The SFMTA has calculated the future investment needed to replace or rehabilitate all assets as they reach the end of their scheduled useful life. This forecast is based on the current asset replacement value and backlog that were discussed earlier in this report. The current 20-Year unconstrained need for State of Good Repair, not including the current backlog, is \$9.3 billion. Addressing all upcoming investment needs as well as the current backlog of \$2.4 billion would amount to \$11.7 billion over the next 20 years. This is slightly higher than the reported 20 year SGR need of \$11.5 billion in the SFMTA's 2015-2034 Capital Plan. The difference can be attributed to the updates that have been made to the asset inventory since the development of the Capital Plan.

Due to the cyclical nature of SGR needs, it is helpful to view annual investments in the context of a 20 year time horizon. Some years require a high level of investment as major assets, such as rolling stock or facilities, reach the end of their useful life. Conversely, other years will require a lower investment level once these high dollar asset replacement projects are completed.

As was mentioned before, TERM Lite modeling does not reflect scheduling or cash-flow assumptions. The entire dollar value of an asset appears in full for the year that it expires. Since the Asset Inventory is updated manually on an annual basis, it is possible that some maintenance campaigns or smaller replacement projects are not represented in this analysis. As the accuracy of the Asset Inventory improves, so will the accuracy of our State of Good Repair analysis.

### 20-Year Investment Needs

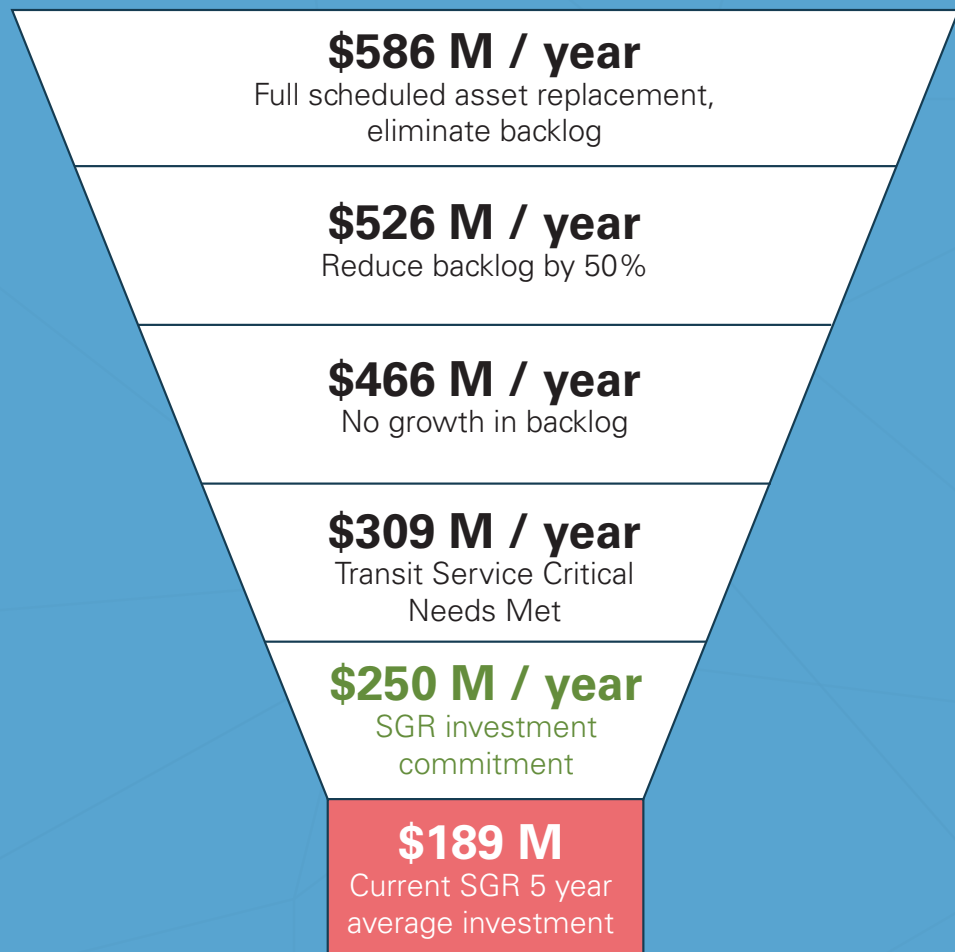
◆ Transit Service Critical Assets
 ◆ Other SGR Assets

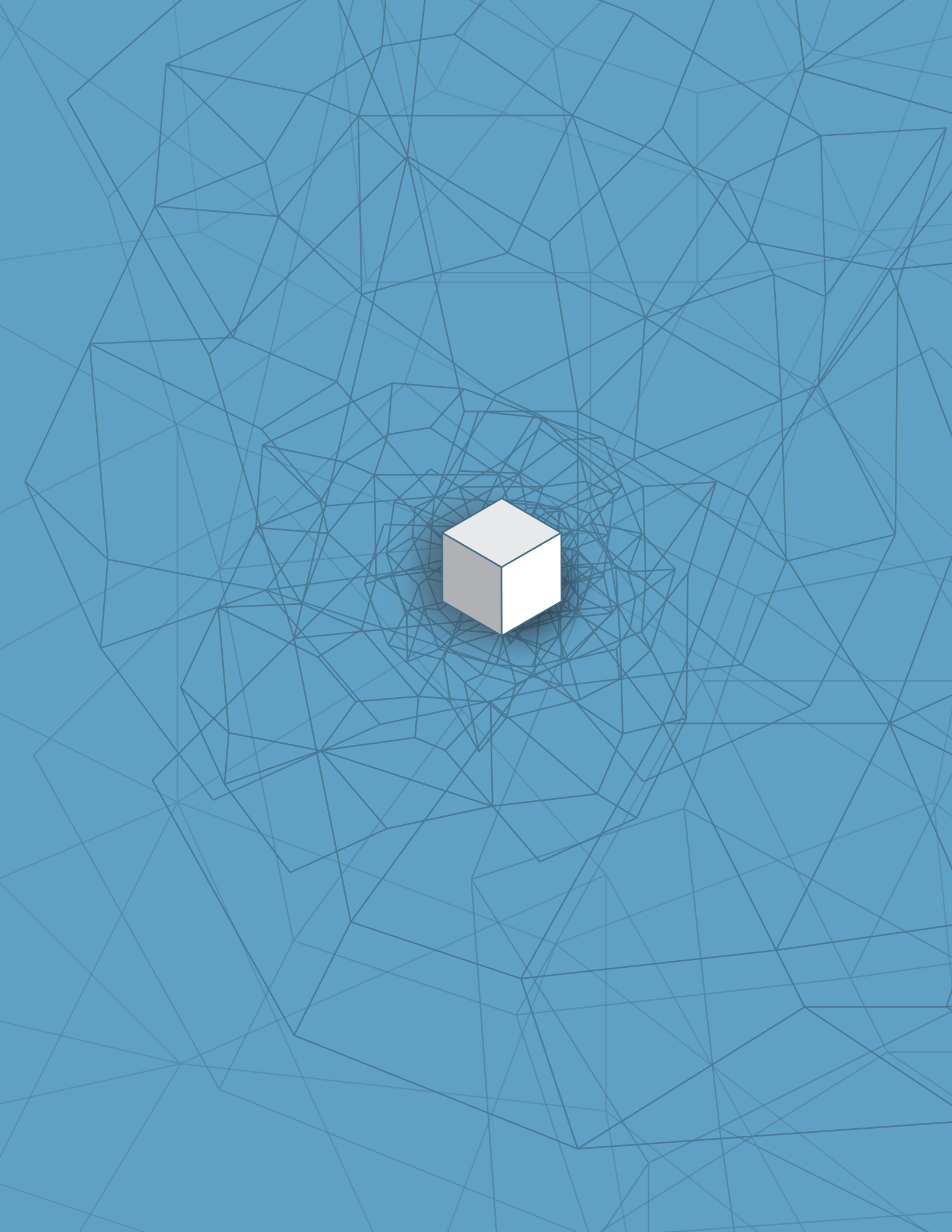


## SGR Investment Scenarios

Based on the \$11.7 billion needed in SGR investments over the next 20 years, the SFMTA would need to invest approximately \$586 million per year to completely eliminate the backlog and address all future SGR needs. To maintain the backlog at its current level, the agency would need to fully fund the \$9.3 billion in SGR needs that will arise over the next twenty years (\$466 million annually). These needs can be further divided into \$6.2 billion needed for Transit Service Critical assets (\$309 million annually) and \$3.1 billion needed for Other SGR assets (\$157 million annually).

This graphic presents different SGR annual investment levels and their impact on the backlog and upcoming SGR needs. As mentioned earlier in the report, the SFMTA has committed to investing an average of \$250 M annually on State of Good Repair over the next 20 years. This commitment was made as part of the full funding grant agreement with the FTA for the Central Subway project. The next section of this report explains how the SFMTA plans to meet this \$250 million annual investment goal.







# State of Good Repair Investments



# 5 YEAR OUTLOOK

The SFMTA's Capital Improvement Program (CIP) is a fiscally constrained five-year program of projects that outlines capital expenditures across all of the agency's 11 Capital Programs.

The CIP is updated every two years concurrently with the two-year Capital Budget. This report covers projects implemented in the FY 2015-2019 CIP, which was approved by the SFMTA Board in May 2014. The FY 2017-2021 CIP was approved by the SFMTA Board in July 2016.

## FY 2015 - 2019 CIP

The FY 2015-2019 CIP included an average annual investment of \$316 million for State of Good Repair. This commitment remains below the annual investment needed to fully replace all assets at the end of their scheduled useful life. However, it addressed a variety of Transit Service Critical needs, such as replacement of Muni's entire rubber tire fleet and completion of major fixed guideway rail projects. This is reflected in the overall Asset Condition scores outlined in the previous section.

## FY 2017 - 2021 CIP

The FY 2017-2021 CIP includes an increased average annual investment of \$340 million for State of Good Repair. This commitment still remains below the \$586 million annual investment needed to fully replace all assets at the end of their scheduled useful life. This CIP addressed the Transit Service Critical needs outlined in the past CIP update with

the inclusion of the replacement and expansion of the paratransit fleet, expansion of the light rail fleet, major rail grinding work, replacement of the automated train control system, and upgrades to our overhead catenary system.

In evaluating the upcoming CIP, it is important to note that a portion of the planned SGR investments are reliant on currently non-committed sources such as state and federal competitive grant initiatives, a new Series of 2017 issuance of SFMTA Revenue Bonds, and potential revenue ballot measures in 2018. The Agency's \$340 million annual SGR commitment outlined in the FY 2017-2021 CIP is therefore contingent on anticipated revenue sources that have not been secured. Revenue assumptions for non-committed funds are generally conservative, but still unknown.

As a capital project implementation plan, the CIP is constantly evolving. On the project side, budgets and cost estimates increase and decrease, unanticipated system needs are identified, and City investment priorities shift. In terms of anticipated revenue sources, competitive grant awards are announced, Congress updates federal transportation legislation impacting Federal Grants and new funding opportunities arise. Therefore, the SFMTA will conduct on-going review of SGR investments throughout the year to track against planned investments outlined in the CIP.





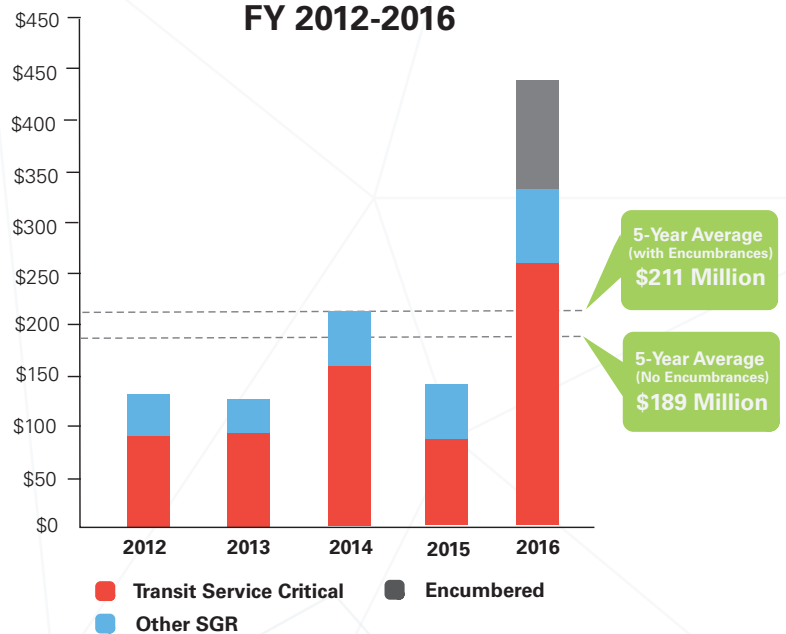
## Fiscal Year 2016 Investments

The SFMTA recently closed out the second fiscal year of the FY 2015 – 2019 CIP. Of the \$427 million in SGR investments planned for FY 2016, the agency secured \$357 for projects and spent a total of \$333 million on maintaining a state of good repair. Appendix C displays the agency’s State of Good Repair Investment Dashboard. This dashboard details total planned investments within the FY 2015-2019 CIP by Capital Program, how much of that investment is State of Good Repair, planned investment for FY 2016, secured funds, and SGR funds spent within the fiscal year.

Fiscal Year 2016 marked the first time that the Agency had met and exceeded the \$250 million annual investment benchmark. The increase in SGR-related expenditures is primarily due to replacement of transit vehicles; transit fixed guideway investments, such as the Green Center rail replacement and Sunset Tunnel trackway projects, radio and ITS systems replacement, and increased spending on SFMTA facility improvements.

As stated earlier in the report, if annual investments match the current planned investment levels, the agency will meet its \$250 million rolling average annual commitment within the next five years.

### SGR Annual Investment (\$M) FY 2012-2016





## Key SGR Investment: FY2016

Over the past fiscal year, the SFMTA has reached critical milestones on SGR projects across the transportation system, including:

### Fleet Rehabilitation & Replacement

- 53 60' trolley buses, 12 40' hybrids and 87 60' hybrids were accepted and put into revenue service replacing vehicles at the end of their useful life.
- New paratransit vehicles have been procured to replace outdated vehicles.
- Automatic Train Control System (ATCS) is currently being installed at five interlock locations (West Portal, Duboce, Castro, Van Ness and Embarcadero) to replace outdated systems.

### Information Technology Upgrades

- Blue Light Emergency Phone Replacement project continues replacing emergency communications within Muni tunnels.
- ITS Radio System Replacement project to replace and modernize SFMTA's radio communications system is complete and being tested.

### Traffic Signal & Street Improvements

- Upgraded 114 traffic signal controller cabinets, replaced 8" vehicle signals with 12" signals at 31 intersections, installed pedestrian signals at 6 intersections to improve safety and replace outdated equipment, and replaced vehicle LED lamps and pedestrian signal heads at 61 intersections.

### Subway and Fixed Guideway Projects

- L Taraval Overhead Catenary System and Track replacement project has continued public outreach. Project engineer is compiling the draft conceptual engineering report. This project will replace 23,000 feet of track, improving safety, reliability, and reducing travel times.
- Sunset Tunnel Trackway Improvement project has completed VTS system installation, installation of track concrete and seismic struts along the tunnel's East Portal, and continues with feeder cable installation. This project will replace and rehabilitate old infrastructure within the Sunset Tunnel.
- M-Ocean View Track replacement project has completed 95% detailed design. This project will replace sections of track, overhead lines, and upgrade traffic signals.
- Twin Peaks Tunnel Rail Replacement project is finishing bid phase. This project will replace track, turnouts, switches, controllers, and upgrade guideway to fixed embedded track between the West Portal and Forest Hill stations.
- 33 Stanyan Pole Replacement and Overhead Line Reconstruction Phase I has begun active construction. Phase II of this project has completed 95% design drawings and will be entering next phase of project.



## Facilities

- Escalator Rehabilitation Phase II project continues, addressing rehab and replacement of 17 escalators throughout the system.
- Rehabilitation of 1508 Bancroft facility has completed initial site evaluation by SF Public Works. This 90,000 sq/ft facility will upgrade and replace vertical conveyance systems, building lighting, HVAC systems, and external envelope insulation to meet energy efficiency standards.
- Green Center storage facility rail replacement project is underway, contractors have completed work replacing worn track and switches in the north ladder track section within the facility.
- Cable Car Gearbox rehabilitation project has issued and received comments on a 65% design review. This project will overhaul and refurbish all cable car gearboxes presently in use at the Cable Car Barn, as well as a spare gearbox unit offsite.
- Islais Creek Phase II project has begun site preparation activities which include surveying utilities, utility relocation, modification of existing driveway, and driving piles for the north and south buildings.
- Replacement of the roof-level waterproof membrane was completed at the Ellis-O'Farrell, 5th & Mission Street, and Sutter & Stockton Street parking garages.
- Kirkland Underground Storage Tank project has entered the detailed design phase.



# FUTURE STEPS

## Improving Asset Management and Project Delivery

The SFMTA is implementing new agency-wide project delivery and long-range planning initiatives. These will help to ensure that the SFMTA can deliver upon its SGR goals and will provide wide-ranging benefits for improving the effectiveness and efficiency of SGR investments. These initiatives include:

### Project Delivery Improvement Group

SFMTA staff involved in various facets of project delivery are currently convening on a regular basis to improve the delivery of projects at SFMTA. In order to deliver the scale of projects necessary to meet our \$250 million investment commitment, the agency needs to improve its project delivery bandwidth. This group intends to develop agency-wide project delivery standards and processes that better define roles and responsibilities across divisions.

### SFMTA Facilities Framework

In this State of Good Repair Report, facilities (including stations) accounted for \$5.02 billion or 37% of all the SFMTA's assets. Facilities also represent one of the SFMTA's largest sources of backlogged State of Good Repair investment needs. As stated in this report, facilities (including stations) represent over one third of the total backlog.

The SFMTA Facilities Framework defines Facilities needs at the project level, identifies revenue and funding sources, and outlines scenarios for addressing our growing facilities needs.

### Project Integration Process

In 2014, the SFMTA began full implementation of a Project Integration Process that is intended to better coordinate project delivery and ensure that the agency delivers Complete Streets projects. The process created a Project Integration Committee of technical experts representing the Agency's Capital Programs that reviews project scopes to identify potential project integration opportunities based on existing plans, policies, and programs.

## Asset Management Program

The SFMTA is working to implement a Transportation Asset Management program to better assess and prioritize the agency's SGR needs. The program is being developed to align with the FTA's Transit Asset Management regulatory requirements.

The implementation of the Transportation Asset Management program is based on a framework of supportive technology, business processes and engaged staff. Asset management is a process and requires ongoing



resources to maintain best practices.

SFMTA will develop an agency Asset Management Plan by October 2018 which will guide the implementation process.

## Enterprise Asset Management System

The Enterprise Asset Management System (EAMS) is currently in implementation and will enable agency-wide asset tracking, work order management, and materials management. The EAM system forms the supportive technology pillar of the Asset Management Program framework.

Once fully deployed, the EAMS will integrate currently disparate asset tracking systems within the Agency and will enable ongoing asset condition assessments as well as capturing all life-cycle costs associated with each asset. These improvements will support asset renewal and replacement programs; and allow for better financial forecasting and planning.

The SFMTA plans to deploy the EAMS across approximately 45 business units within agency by late 2019. Over the next year, the SFMTA and project consultants will complete

system set-up and basic configuration, and complete implementation with the Rail Vehicle Maintenance units and a number of other transit support shops.



# APPENDICIES

## Appendix A: 2016 Inventory and Backlog Update

The following list captures the changes made to the SFMTA Capital Asset Inventory. These changes are reflected in the analysis that are reported in the 2016 State of Good Repair Report.

- Updated records to reflect Phase 2 Escalator Replacement Project
- Added Operator Restroom records to reflect Phase 2C of the project.
- Retired duplicate Operator Restroom records.
- Updated parking garage asset records to reflect waterproofing and HVAC upgrades.
- Updated cost of paratransit vehicles.
- Retired historic streetcars that have been scrapped, wrecked or on permanent loan.
- Aligned historic streetcar records with inventory from Transit Division.
- Replaced outdated Parking Meter records with records that updated unit cost, useful life, and installation dates.
- Replaced records related to signalized intersections to accurately reflect rehabilitation schedule, updated unit costs, and unit quantities.
- Replaced records related to street signs and markings to more accurately reflect rehabilitation schedule.
- Updated revenue fleet records to align with updated fleet planning documentation, this update more accurately captures planned procurements, retirement schedules, and lifecycle phases.
- Edited the Islais Creek facility record to more accurately reflect the multiphase nature of the project.



## Appendix B: SFMTA Transportation Asset Management Policy

### **SFMTA Transportation Asset Management Policy**

1. The SFMTA Asset Management Strategy will be guided by the SFMTA strategic goals.
2. The Agency will use an inventory to know what its assets are, where each asset is located, and the lifecycle requirements for each asset. Every record will be managed and maintained by a Data Owner.
3. Assets will be the common language to link planning, acquisition, disposal, and operations and maintenance of assets using standard policies, processes, data, and analytical tools.
4. Management of agency assets will be a shared responsibility with clear accountability.
5. Assets will be managed using an Asset Management Plan to guide cost-effective, lifecycle management.
6. The Agency will seek to maintain, renew, and extend the life of its assets, and will use performance data to evaluate if assets are performing as intended.
7. The Agency will use a transparent, streamlined, repeatable, collaborative, and data driven approach to decision making for capital investments which takes into consideration the geography, the condition, and the risk of failure of the assets.
8. The asset inventory will align with the agency's financial records.



# APPENDICIES

## Appendix C: FY 2016 Investment Dashboard

### State of Good Repair Investment Progress Tracker Fiscal Year 2016

Capital Program	FY 2015 - 2019 Planned Investment	FY 2015 - 2019 Planned SGR Investment	FY 2016 Planned SGR Investment	FY 2016 SGR Funds Secured	FY 2016 SGR Funds Spent
Accessibility	\$15,067,000	\$15,067,000	\$1,167,000	\$8,386,000	\$9,373,000
Bicycle	\$119,187,000	\$23,837,000	\$7,091,000	\$4,493,000	\$991,000
Central Subway	\$792,899,000	--	--	--	--
Communication/IT Infrastructure	\$44,378,000	\$44,378,000	\$4,020,000	\$34,969,000	\$37,705,000
Facility	\$134,903,000	\$134,903,000	\$45,800,000	\$42,017,000	\$25,729,000
Fleet	\$1,080,278,000	\$864,222,000	\$256,839,000	\$157,647,000	\$188,352,000
Parking	\$41,080,000	\$41,080,000	\$8,367,000	\$5,491,000	\$7,389,000
Pedestrian	\$70,827,000	\$7,083,000	\$1,826,000	\$2,657,000	\$622,000
School	\$10,901,000	--	--	--	--
Security	\$33,263,000	\$33,263,000	\$10,071,000	\$4,794,000	\$5,954,000
Taxi	\$3,910,000	--	--	--	--
Traffic Calming	\$22,801,000	\$2,280,000	\$914,000	\$153,000	\$668,000
Traffic/Signals	\$74,624,000	\$74,624,000	\$24,865,000	\$22,687,000	\$10,370,000
Transit Fixed Guideway	\$217,738,000	\$217,738,000	\$33,603,000	\$58,493,000	\$41,062,000
Transit Optimization/Expansion	\$652,662,000	\$130,532,000	\$32,476,000	\$14,812,000	\$4,750,000
<b>Total</b>	<b>\$3,314,516,000</b>	<b>\$1,589,006,000</b>	<b>\$427,038,000</b>	<b>\$356,599,000</b>	<b>\$332,965,000</b>



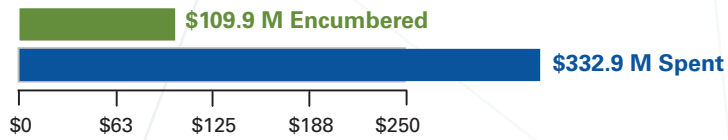


## PROGRESS TRACKER

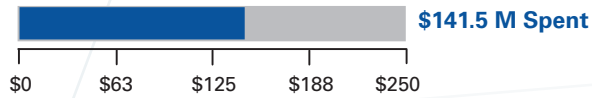
**\$250 Million Average Annual Investment Goal**



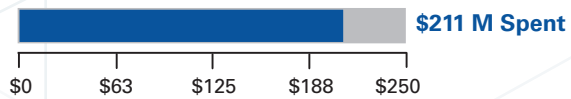
**FY 2016**



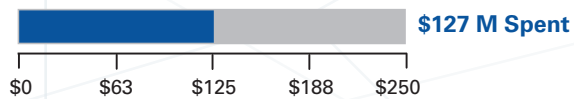
**FY 2015**



**FY 2014**



**FY 2013**





# APPENDICES

## Appendix D: Planned Investments by Capital Program: All Investments FY 2017-2021 Capital Improvement Program (CIP) Includes State of Good Repair, Expansion & Enhancement Projects. All amounts shown in Millions (\$M)

Capital Program	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	CIP Total
Central Subway	\$154.0	\$150.0	\$98.5	--	--	\$402.5
Communications/ IT Infrastructure	\$8.8	\$0.4	\$0.7	\$0.7	\$0.7	\$11.2
Facility	\$104.4	\$52.7	\$25.3	\$10.5	\$50.5	\$243.5
Fleet	\$504.6	\$352.2	\$158.9	\$101.3	\$73.2	\$1,190.2
Parking	\$1.2	\$5.0	\$10.0	--	--	\$16.2
Security	\$5.6	\$10.1	\$3.0	\$3.0	\$3.0	\$24.7
Streets	\$26.1	\$56.2	\$79.1	\$49.4	\$46.0	\$256.7
Taxi	\$0.4	\$0.4	\$0.4	\$0.4	\$0.4	\$2.0
Traffic Signals	\$36.2	\$28.4	\$15.2	\$8.0	\$11.8	\$99.7
Transit Fixed Guideway	\$48.3	\$47.0	\$57.3	\$34.9	\$35.5	\$223.0
Transit Optimization/ Expansion	\$216.9	\$152.7	\$259.1	\$229.2	\$107.1	\$965.0
Other	\$3.6	\$4.7	\$0.7	\$0.8	\$0.2	\$9.9
<b>Total</b>	<b>\$1,110.0</b>	<b>\$859.8</b>	<b>\$708.2</b>	<b>\$438.2</b>	<b>\$328.5</b>	<b>\$3,444.7</b>



**Appendix E:**  
**Planned SGR Investments by Capital Program**  
**FY 2017-2021 Capital Improvement Program (CIP)**  
 All amounts shown in Millions (\$M)

<b>Capital Program</b>	<b>CIP Total (\$M)</b>	<b>SGR Total (\$M)</b>	<b>SGR Category</b>
Central Subway	\$402.5	\$0.0	--
Communications/IT Infrastructure	\$11.2	\$11.2	<b>TSC</b>
Facility	\$243.5	\$243.5	<b>Other</b>
Fleet	\$1,190.2	\$833.2	<b>TSC</b>
Parking	\$16.2	\$16.2	<b>Other</b>
Security	\$24.7	\$24.7	<b>Other</b>
Streets	\$256.7	\$25.7	<b>Other</b>
Taxi	\$2.0	\$0.0	--
Traffic/Signals	\$99.7	\$99.7	<b>Other</b>
Transit Fixed Guideway	\$223.0	\$223.0	<b>TSC</b>
Transit Optimization/Expansion	\$965.0	\$193.0	<b>Other</b>
Other	\$9.9	\$0.0	--
<b>Total</b>	<b>\$3,444.7</b>	<b>\$1,670.1</b>	



# APPENDICIES

## Appendix F: Select Capital Projects Scopes, FY 2015-19 Capital Improvement Program (CIP)

### **Blue Light Phone Emergency**

Replace the blue light phone system in the Muni Metro Sunset and Twin Peaks Tunnels with updated phone switchers, call stations with phone set and bluelight indication, emergency backup electrical power supply wiring infrastructure, and telecommunication wiring instructions. New blue light emergency phones will allow operators to reach central control, traction power and other stations or the local fire department in emergency situations. The current phone system was installed in the early 1980s with a stated useful life of 20-25 years, and is therefore overdue for replacement. Due to the age of the system significant resources are currently required to keep the system operational.

### **Communications Systems Replacement**

Replace antiquated radio communications system for both revenue and non-revenue fleets with a modern radio and data communications system. The existing Motorola Metrocom system is 30 years old and at the end of its useful life, as well as being incompatible with "smart" vehicle applications such as Automatic Passenger Counters.

### **Upgrade Life and Fire Safety Systems**

Replace/upgrade the existing life and fire safety systems at key Muni-Metro maintenance facilities. Existing systems are reaching the end of their useful lives and have become difficult to maintain. System replacement is critical for the sites to remain code compliant and to ensure the safety of SFMTA employees during a disaster.

### **Replacement of Rubber Tire Fleet**

The SFMTA will utilize several multi-year contracts to replace all motor coaches currently in service, including 60', 40' and

30' vehicles. The SFMTA's current rubber tire fleet is reaching the end of its approved Federal Transit Administration (FTA) lifespan. Vehicles will be replaced over the next five years as they reach the end of their useful life.

### **Replacement and Rehabilitation of Trolley Coaches**

Replace 60' and 40' Trolley coaches as they reach the end of their approved Federal Transit Administration (FTA) lifespan. The SFMTA will also be rehabilitating its historic streetcar fleet, which includes a collection of vehicles from across the US. Due to their historic nature, these vehicles are not replaced on a regular schedule, making a program of regular rehabilitation critical to the long-term operation of the fleet.

### **Vehicle Overhauls**

Conduct mid-life overhauls on SFMTA's transit vehicles as vital part of keeping the transit fleet in a state of good repair. Traditionally SFMTA has not had funds for mid-life overhauls, resulting in frequent breakdowns, costly vehicle repairs and disruption of transit service. This funding reserve for midlife overhauls will help SFMTA to improve service reliability.

### **Muni Metro Sunset Tunnel Rail Rehabilitation**

Upgrade Sunset Tunnel to improve safety and efficiency of the rail network. Upgrades include: replacing track, cleaning drain lines, painting portal walls, replacing overhead contact system (OCS), upgrading feeder cables, upgrading curve signals at the western portal, replacing firefighting standpipe components, and seismically upgrading the east and west portal walls.

### **Muni Metro Twin Peaks Track Replacement**

Conduct rail upgrades to bring the Twin Peaks tunnel into a state of good repair. Project includes, but is not limited to: 1) Replace track-work with 115RE rail, composite ties, ballast, and new rail plates and fasteners; 2) Replace the single crossover between West Portal and Forest Hill Stations; 3) Replace turnouts; 4) Replace four electrified switch machines and track switch controllers and provide one spare switch machine; 5) Replace tie and ballast tracks with direct fixation embedded track; 6) Clean and repair damaged drain line; 7) Install flood lighting; 8) Add recommendations from the recently developed Seismic Rehabilitation Report.



### **Replacement of Manual Trolley Switch System**

Replace manual switches with new trolley switches that have remote operability and load break capability. This entails upgrading the Presidio Yard with new switches that will allow traction power circuit redundancy from yard to mainline and vice versa. The project would replace 32 trolley switches on the streets and add one additional switch for the Presidio Yard between the yard and the main line.

### **Special Trackwork Replacement in the Subway**

Replace individual components of the crossovers and turnouts in the subway. Components would include turnout frogs, switch points, and closure and stock rails for 16 turnouts. Provisions for spare parts and components should be included. Other items would include replacement of existing ties embedded in the concrete with new composite ties, which have greater resistance to rot.

### **Pedestrian Countdown Signals**

Design and install pedestrian countdown signals (PCS) at various intersections throughout the city. PCS locations are prioritized using factors such as collision history, inclusion in a WalkFirst corridor, proximity to schools and commercial districts and requests from the public. Most of these intersections will involve a full signal upgrade with new conduits, pullboxes, poles, larger signal heads, controllers, etc. A small number of locations have conduits that are in satisfactory condition such that pedestrian signals can be added using existing signal infrastructure.

### **New Traffic Signals**

Implement signals, signal infrastructure and flashing beacons at various locations throughout the city. Locations for new signals will be chosen after a bi-annual review with regards to account collision history, collision volume, pedestrian generators and transit impacts. New traffic signal work will include: pedestrian countdown signals (PCS), controllers, conduit, wiring, poles, curb ramps, and mast arm mounted signals as needed. Flashing beacon locations will have beacons installed facing both directions at the midblock crosswalk.

### **Join Opportunities for New Traffic Signals**

Coordinate with paving, curb ramp and streetscape projects to upgrade signal infrastructure such as new conduit, pullbox or pole relocations. This funding reserve will allow the SFMTA to leverage non-signal projects, such as paving work conducted by the Department of Public Works or Complete Street projects, as an opportunity to improve signal infrastructure in a timely and cost-efficient manner.

### **Van Ness Bus Rapid Transit**

Implement Van Ness Avenue Bus Rapid Transit (Van Ness BRT) to improve approximately two miles of a major north-south urban arterial in San Francisco to include a dedicated lane for BRT buses in each direction. The improvements will occur on Van Ness Avenue between Mission Street, just south of Market Street, and Lombard Street. The street is currently three mixed-flow through traffic lanes in each direction, with protected left turns at certain signalized intersections. The center (#1) lane, adjoining the median that exists along much of the alignment, will be converted to a bus only lane. BRT stations will be constructed at nine signalized intersections with a platform on the right side of the BRT lane for passenger boarding and drop-off.

### **Better Market Street**

This project will deliver improvements on Market Street with the goal to revitalize Market Street from Octavia Boulevard to The Embarcadero to reestablish the street as the premier cultural, civic and economic center of San Francisco and the Bay Area. The new design will aim to create a comfortable, universally accessible, sustainable, and enjoyable place that attracts more people on foot, bicycle and public transit to visit shops, adjacent neighborhoods and area attractions.

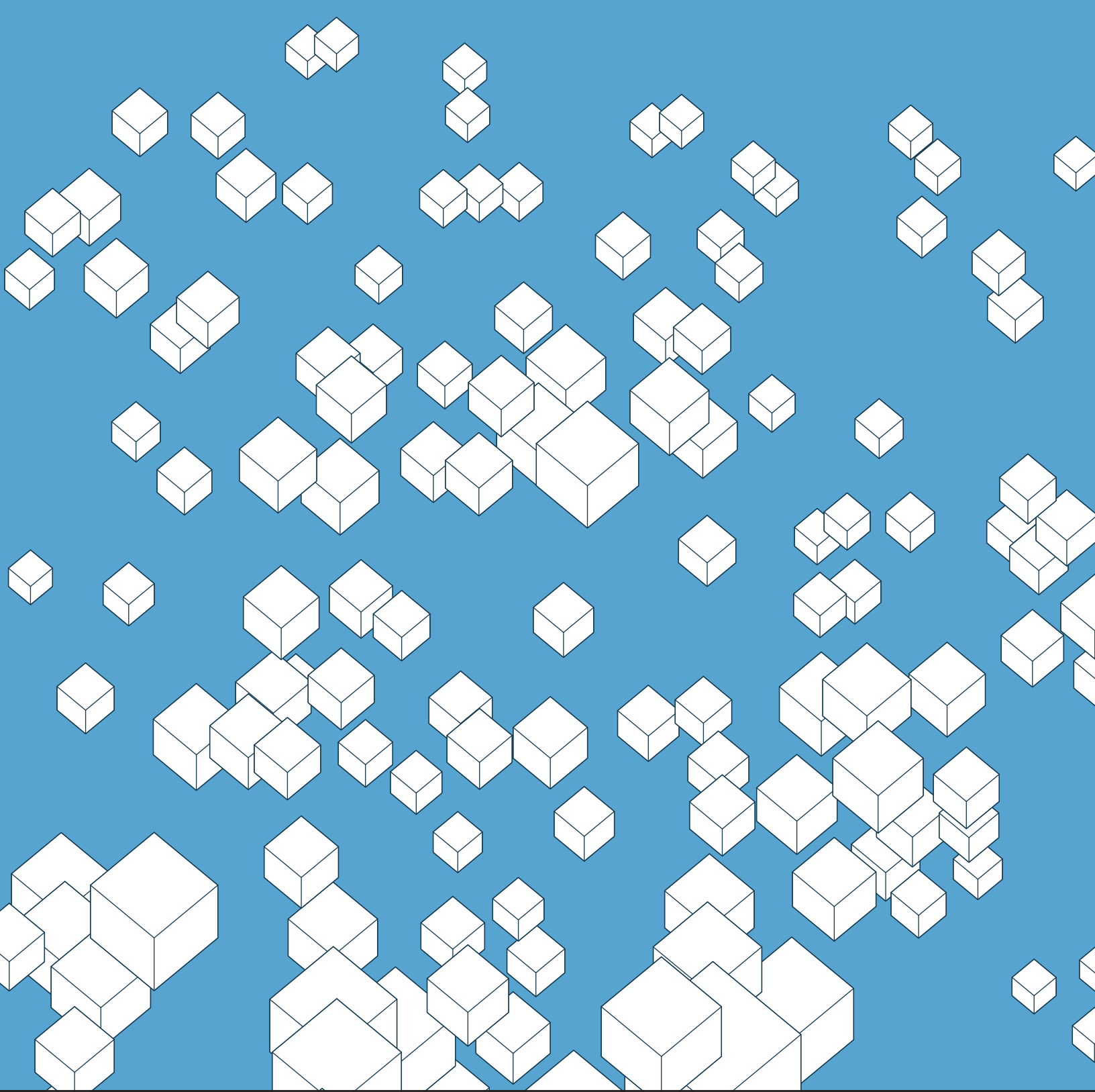


# APPENDICIES

## Appendix G: Capital Program by SGR Investment Level FY 2017-2021 Capital Improvement Program (CIP)

Capital Program FY 2017 - 2021 CIP	SGR Investment Level (EST)
1. Communications & IT	100%
2. Facility	100%
3. Security	100%
4. Traffic & Signals	100%
5. Transit Fixed Guideways	100%
6. Parking	100%
7. Fleet	70%
8. Transit Optimization & Expansion	20%
9. Streets	10%
10. Central Subway	0%
11. Other	0%
12. Taxi	0%





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