



# State of Good Repair Report

San Francisco Municipal Transportation Agency  
Annual State of Good Repair Report  
Fiscal Year 2015

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**SFMTA**  
Municipal  
Transportation  
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# Executive Summary

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The San Francisco Municipal Transportation Agency's 2015 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 third comprehensive State of Good Repair (SGR) Report published by the SFMTA. As such, it aims to track the progress of SGR investments and asset management practices compared to previous reporting periods. This document builds directly upon the 2014 State of Good Repair Report—which utilized the same asset analysis tool to determine asset condition and future SGR needs—and provides updated needs that reflect changes in cost due to inflation and inventory changes.

The 2015 State of Good Repair Report focuses primarily on the current State of Good Repair for SFMTA assets and the agency's plan for improving SGR over the next five years.

- **Part I** introduces the SFMTA, outlines the agency's capital planning process, and defines State of Good Repair.
- **Part II** focuses on the SFMTA's 2015 SGR analysis, including: comparison to the 2014 analysis, asset condition assessment, and the agency's financial ability to invest.
- **Part III** explains how the SFMTA is addressing SGR needs, including investments made in Fiscal Year 2015 and a future five-year outlook.
- **Part IV** outlines future steps for improving asset management and project delivery practices to better manage State of Good Repair.

The SFMTA has committed to investing an average of \$250 million annually\* on State of Good Repair. These funds are primarily directed towards "Transit Service Critical" investments and are spread across many of the SFMTA's 15 Capital Programs; they are also distributed between upcoming SGR needs and the SGR backlog of \$2.47 billion.

Since 2011, the SFMTA has invested an average of \$215 million annually\*\* on State of Good Repair. The agency recently closed out the first Fiscal Year of the FY 2015-2019 Capital Improvement Program (CIP), a five-year program of projects that outlines capital expenditures across the transportation system. The FY 2015-2019 CIP allocated an unprecedented level of investment towards meeting SGR needs: \$1.5 Billion in SGR expenditures out of a total investment of \$3.3 Billion over the five-year CIP cycle. This increased level of investment will put the agency on-track to meet its \$250 million annual commitment over the next five years.

\*This commitment was made to the Federal Transit Agency (FTA) in 2010 as part of the full-funding grant agreement for the Central Subway project.

\*\* This figure includes dollars currently encumbered in contracts. The average is \$145M for expenditures only (excluding encumbered funds).

It is important to note that State of Good Repair is only a portion of the SFMTA's total capital investments. Non-SGR investments include projects to expand and enhance the transportation system, such as the new Central Subway currently under construction. New assets introduced through expansion projects will be added to the Capital Asset Inventory upon completion.

The agency is currently introducing new asset management and project delivery practices that will increase the efficiency and effectiveness of SGR investments, including:

- An Enterprise Asset Management System (EAMS) that will be developed over the next three years to better track assets and maintenance activities.
- An agencywide framework for project delivery supported by a Capital Program Control System (CPCS) with real time performance metrics to help to ensure the timely delivery of projects and efficient allocation of resources.

These changes, coupled with an increase in SGR funding, will improve the reliability and comfort of San Francisco's transportation system.

The SFMTA will continue to publish a State of Good Repair Report annually to assess the agency's progress in maintaining a State of Good Repair. The agency will also continue to provide a quarterly financial update to measure the on-going progress toward meeting the State of Good Repair investment goals outlined herein.



# 1.0 Introduction

The SFMTA

Overview of State of Good Repair



# The SFMTA

## Who We Are

A department of the City and County of San Francisco, the San Francisco Municipal Transportation Agency (SFMTA) manages all ground transportation in the city. For more than 100 years, we have kept people moving with the San Francisco Municipal Railway (Muni), the nation's eighth largest public transit system. We also manage parking and traffic, facilitate bicycling and walking, regulate taxis, and plan and implement strategic, community-based projects to improve the transportation network and prepare for the future. Our diverse team of almost 5,400 employees is one of the city's largest, with representation by 18 labor organizations.

San Francisco voters established Muni in 1912, creating the nation's first publicly owned transit system. In 1999 voters created the SFMTA by passing Proposition E, which merged Muni with the Department of Parking and Traffic to form an integrated agency to manage city streets more effectively and advance the city's Transit First policy. In 2009 the SFMTA merged with the Taxi Commission to further streamline transportation management in San Francisco.

A Board of Directors governs the agency, providing policy oversight and ensuring the public interest is represented. The Board's duties include approving the agency's budget and contracts and authorizing proposed changes to fares, fees and fines. Its seven members are appointed by the Mayor and confirmed by the Board of Supervisors.

## What We Do

The San Francisco Municipal Transportation Agency 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. In addition to overseeing paratransit service for those unable to use fixed-route transit service, the agency also regulates the taxi industry and oversees on- and off-street public parking spaces.

# Overview of State of Good Repair

The SFMTA is committed to maintaining its transportation infrastructure in a State of Good Repair (SGR). As such, the agency's Transportation Asset Management (TAM) Program has established a Transportation Asset Management Policy and set forth goals that are consistent with the Federal Transit Administration's guidance under Moving Ahead for Progress in the 21st Century (MAP-21). See Appendix B for the SFMTA's Transportation Asset Management Policy.

The SFMTA's Transportation Asset Management Goals are:

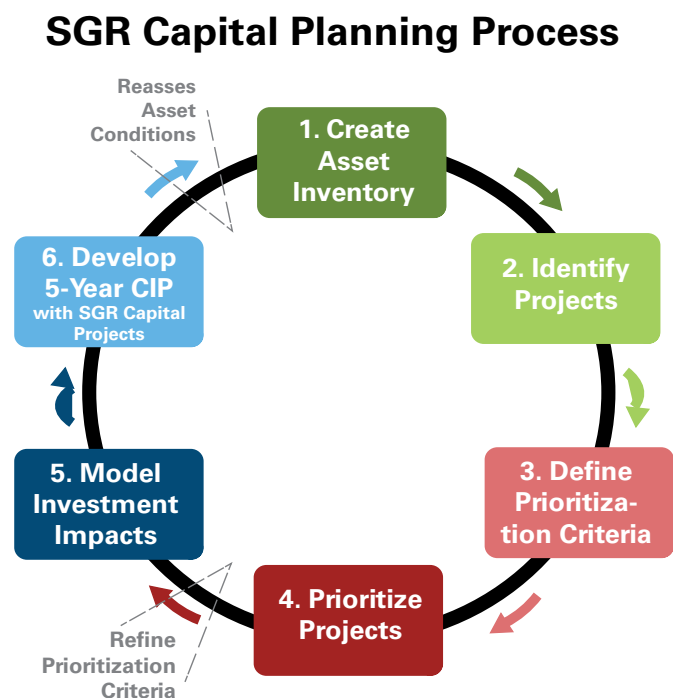
1. Develop policies, processes, data and analytical tools to manage all assets
2. Systematically and efficiently maintain, renew and extend the life of transportation assets
3. Provide the City with a safe, reliable, high performing and cost effective transportation system

The foundation of the TAM 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 SFMTA utilizes a range of decision support tools to assess asset condition, project investment needs, and prioritize investments, which are then implemented via the agency's program of capital projects.

Because the SFMTA operates in a fiscally constrained environment, the agency must balance State of Good Repair needs with operations, enhancement, and expansion priorities. In 2010, the SFMTA committed to investing an average of **\$250 million annually** on State of Good Repair over 20-year timeframe. This was a condition of the Full Funding Grant Agreement with the Federal Transit Administration (FTA) for the Central Subway project.

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. See page 22 for more detailed information on the impact of various funding levels on State of Good Repair.

Figure 1: SGR Capital Planning Process



## The 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, which identifies four overarching Strategic Goals for the agency and for the transportation system:

1. Create a safer transportation experience for everyone.
2. Make transit, walking, bicycling, taxi, ridesharing, and carsharing the preferred means of travel.
3. Improve the environment and quality of life in San Francisco.
4. Create a workplace that delivers outstanding service.

The **20-year Capital Plan** is a needs-based assessment of the SFMTA's anticipated capital needs for the upcoming 20 years. It is a financially unconstrained plan, meaning that it includes capital needs for which 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 project must be included in the 20-Year Capital Plan to be eligible for inclusion in the fiscally constrained 5-Year Capital Improvement Program (CIP). Moreover, it informs citywide and regional capital funding priorities for the City and County of San Francisco and the Bay Area.

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 total capital needs, which includes all potential SFMTA capital investments over the next 20 years. Of this total, over \$11.45 billion is needed for the ongoing replacement and restoration of the agency's existing assets. These State of Good Repair investment needs are identified through an analysis of the capital asset inventory using TERM Lite to project 20 year SGR needs.

The agency's **5-year Capital Improvement Program (CIP)** is a fiscally constrained program of capital projects that is organized into 15 Capital Programs (Facilities, Transit Fixed Guideway, Transit Optimization & Expansion, etc.) based on the type of capital investment. The CIP is updated every two years concurrently with the 2-Year Capital Budget.

The SFMTA is currently implementing the FY 2015 – 2019 CIP, which was adopted by the SFMTA Board in May 2014. The FY 2015-2019 CIP includes 370 projects for a total investment of \$3.3 billion. This includes infrastructure investments, capital procurements, area plans, and one-time initiatives such as educational programs. Of this \$3.3 billion, \$1.5 billion will be dedicated to SGR investments over the next five years. The FY 2017-2019 CIP is currently under development, and is anticipated to be adopted in spring 2016.



## 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.

Figure 2 categorizes Asset Classes and Capital Programs as either Transit Service Critical or Other SGR:

### SGR Classification Matrix

Figure 2: SGR Classification Matrix

	Asset Class	Capital Program
Transit Service Critical	<ul style="list-style-type: none"> <li>1. Light Rail Vehicles</li> <li>2. Motor Coach Vehicles</li> <li>3. Overhead Catenary System</li> <li>4. Track</li> <li>5. Train Control &amp; Communications</li> <li>6. Trolley Coach Vehicles</li> <li>7. Other Systems/Vehicles (TSC)</li> </ul>	<ul style="list-style-type: none"> <li>1. Transit Fixed Guideway</li> <li>2. Fleet</li> <li>3. Communications &amp; IT</li> </ul>
Other SGR	<ul style="list-style-type: none"> <li>8. Facilities</li> <li>9. Parking &amp; Traffic</li> <li>10. Stations</li> <li>11. Other Systems/Vehicles (Other)</li> </ul>	<ul style="list-style-type: none"> <li>4. Facility</li> <li>5. Accessibility</li> <li>6. Pedestrian</li> <li>7. Bicycle</li> <li>8. Traffic Calming</li> <li>9. Security</li> <li>10. Traffic &amp; Signals</li> <li>11. Parking</li> <li>12. Transit Optimization &amp; Expansion</li> </ul>
Non-SGR		<ul style="list-style-type: none"> <li>13. Central Subway</li> <li>14. School</li> <li>15. Taxi</li> </ul>

## Defining 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.

In calculating annual SGR investment, the SFMTA analyzes planned expenditures at the project Capital Program levels. 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. Other 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-grain project level. See Appendix F for a list of Capital Programs by estimated SGR investment level for the 2015-2019 CIP.

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 lives. 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 towards achieving a State of Good Repair as part of its Transportation Asset Management (TAM) Program.

In conducting its 2015 SGR analysis, the SFMTA used the Transit Economic Requirements Model Lite (TERM Lite). TERM Lite assists in evaluation of the current SGR Backlog, future investment needs, and different funding and prioritization scenarios. Part II of this report will give a detailed summary of the SFMTA's 2015 TERM Lite analysis, along with steps for improving SGR estimates going forward.



# 2.0 State of Good Repair Needs

Capital Asset Inventory Background

State of Good Repair Needs Analysis Background

2015 State of Good Repair Findings



# 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 3600 asset items in the 2009-2010 asset inventory process. This included transit-related assets such as track, catenary 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 AECOM, with later review and refinement by the region's Metropolitan Transportation Commission (MTC) and Booz Allen Hamilton. 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) and C2HM Hill to make these updates in 2011, which fed into the MTC's Regional Transit Capital Inventory (RTCI).

In 2014, the Capital Asset Inventory was updated to reflect the completion of SGR-related transit projects by the agency's Capital Planning and Construction (CP&C) and Fleet Engineering divisions. In addition to including new assets, the agency made updates to several existing assets to reflect more accurate useful life and unit replacement costs. These refinements included rail, facility, and fleet asset types. The 2014 inventory updates are reflected in the agency's 2014 State of Good Repair Report.

In 2015, the SFMTA again updated the Capital Asset Inventory to reflect the completion of SGR-related transit projects between November 2014 and June 2015. This update included projects completed by the agency's Capital Planning and Construction (CP&C) and Fleet Engineering divisions; capital work completed by SFMTA's other divisions, such as Sustainable Streets, was not included in the inventory update.

Moving forward, the SFMTA anticipates that there will be a substantial ongoing effort to update data records in the inventory that are outdated or missing, as well as to update data—especially those from delivery divisions that have been a lower priority due to staffing constraints—on a more frequent basis.

See Appendix A for a list of specific inventory updates made in 2015.

## Capital Asset Inventory Next Steps

As described in the 2014 State of Good Repair Report, the SFMTA is continuing to refine its Capital Asset Inventory. Below is a summary of key improvements that the agency plans to implement in upcoming years. The SFMTA will measure and report upon these improvements, where possible, in future SGR reports.

1. Include data on planned asset expansion projects such as the Central Subway.
2. Include updated reporting requirements from MAP-21 and the Asset Management rule-making.
3. Develop and implement a process to capture replacement and rehabilitation of assets as they happen.
4. Integrate the inventory with the forthcoming Enterprise Asset Management (EAM) System to improve Agency-wide asset management. Integration with the EAM system will allow the SFMTA to update inventory in real time by collecting data on an ongoing basis. Currently, the inventory is only updated periodically.
5. In concert with the implementation of the EAM, move from a coarse-grain inventory to a fine-grain inventory, particularly in the areas of vehicles, overhead catenary system, track, and facilities.
6. Utilizing the implementation of the EAM, add existing assets that are not already in the inventory, including pedestrian and bicycle infrastructure.
7. Refine per unit costs by asset, and develop a process for evaluating replacement cost.
8. Further refine rehabilitation schedules in the inventory based on the implementation of MAP-21 requirements.
9. Conduct risk assessments and multi-variable condition assessments for all assets to support more precise SGR evaluation and more data-driven project prioritization.
10. Develop an analysis methodology for assets that do not require replacement due to unique circumstances. Examples include tunnel structures and historic streetcars.
11. Develop an efficient and effective methodology to compare SGR outputs on a year-to-year basis.

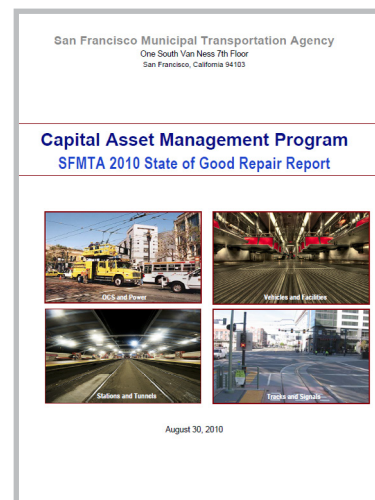


# SGR Needs Analysis Background

## 2010 State of Good Repair Report

The 2010 State of Good Repair Report was based on the 2009 Capital Asset Inventory, which calculated asset condition based on asset age relative to scheduled useful life. For this inaugural report, the SFMTA used the SGR Model, a tool developed by AECOM for the Massachusetts Bay Transportation Authority (MBTA).

The 2010 report analyzed both fiscally unconstrained and fiscally constrained modeling scenarios. For the fiscally unconstrained scenario, the model assumed that all deferred needs (assets that are overdue for replacement) were addressed first, and were only constrained by the project delivery schedules. For fiscally constrained scenarios, the model assessed the impact of limited investment capabilities and project prioritization. This allowed the SFMTA to explore the impacts of different funding scenarios, as well as to assess changing the weighting of age-based condition and other prioritization factors.



## 2014 State of Good Repair Report

The 2014 State of Good Repair Report was based on the agency's 2014 Capital Asset Inventory, which also calculated asset condition based on asset age relative to scheduled useful life. The 2014 Asset Inventory accounted for key SGR capital projects completed between 2010 and 2014. The SFMTA used the Federal Transit Administration's TERM Lite modeling tool to calculate SGR investment needs. TERM Lite differs from AECOM's SGR Model in several respects. One key difference is that it does not support multi-year project cash flow assumptions; instead, replacement costs are evaluated to be due in full in the final year of an asset's scheduled useful life. Similarly, in an unconstrained spending scenario, the deferred need, or backlog, is modeled to be addressed in a single year regardless of the time needed to deliver a project.



# 2015 State of Good Repair Analysis

## Overview

The 2015 State of Good Repair Report is based on the agency's 2015 Capital Asset Inventory, which accounts for key SGR capital projects completed between November 2014 and June 2015. The SFMTA once again used the Federal Transit Administration's TERM Lite modeling program to calculate current and future SGR investment needs that reflect changes in the inventory, including those due to inflation, updated unit costs, and data improvements.

For fiscally constrained scenario testing, the SFMTA used TERM Lite's default capital project prioritization methodology. This methodology is based on the evaluation of various factors related to the asset, such as: safety and security concerns; operating and maintenance cost impacts; reliability; and current condition. As mentioned previously, the SFMTA is currently evaluating asset condition based solely on asset age, which shows an asset's condition score deteriorating as it reaches the end of its scheduled useful life. Moving forward, as the SFMTA implements MAP-21 requirements, the agency will incorporate additional factors into condition scoring. This refined condition scoring will support more precise SGR assessments and more data-driven project prioritization. It will also be supported by the development of the agency's Enterprise Asset Management System (EAMS), which is due to roll out as a prototype in late 2017 and will be implemented agency-wide by 2019.



## Total Asset Replacement Value

The first step in calculating future investment need is to define the SFMTA’s current total asset replacement value. The 2014 State of Good Repair analysis calculated a total asset replacement value of \$13.2\* billion; that value increased to \$13.5 billion in 2015.

The overall increase in total asset replacement value is primarily due to updates to unit replacement costs, data improvements, and inflation. The only asset class category to significantly decrease in value is Light Rail Vehicles, which decreased from \$88 to \$78 million due to updated unit replacement costs based on the SFMTA’s recent LRV procurement contract with Siemens.

### Total Asset Replacement Value Comparison 2014 (\$13.2B) & 2015 (\$13.5B)

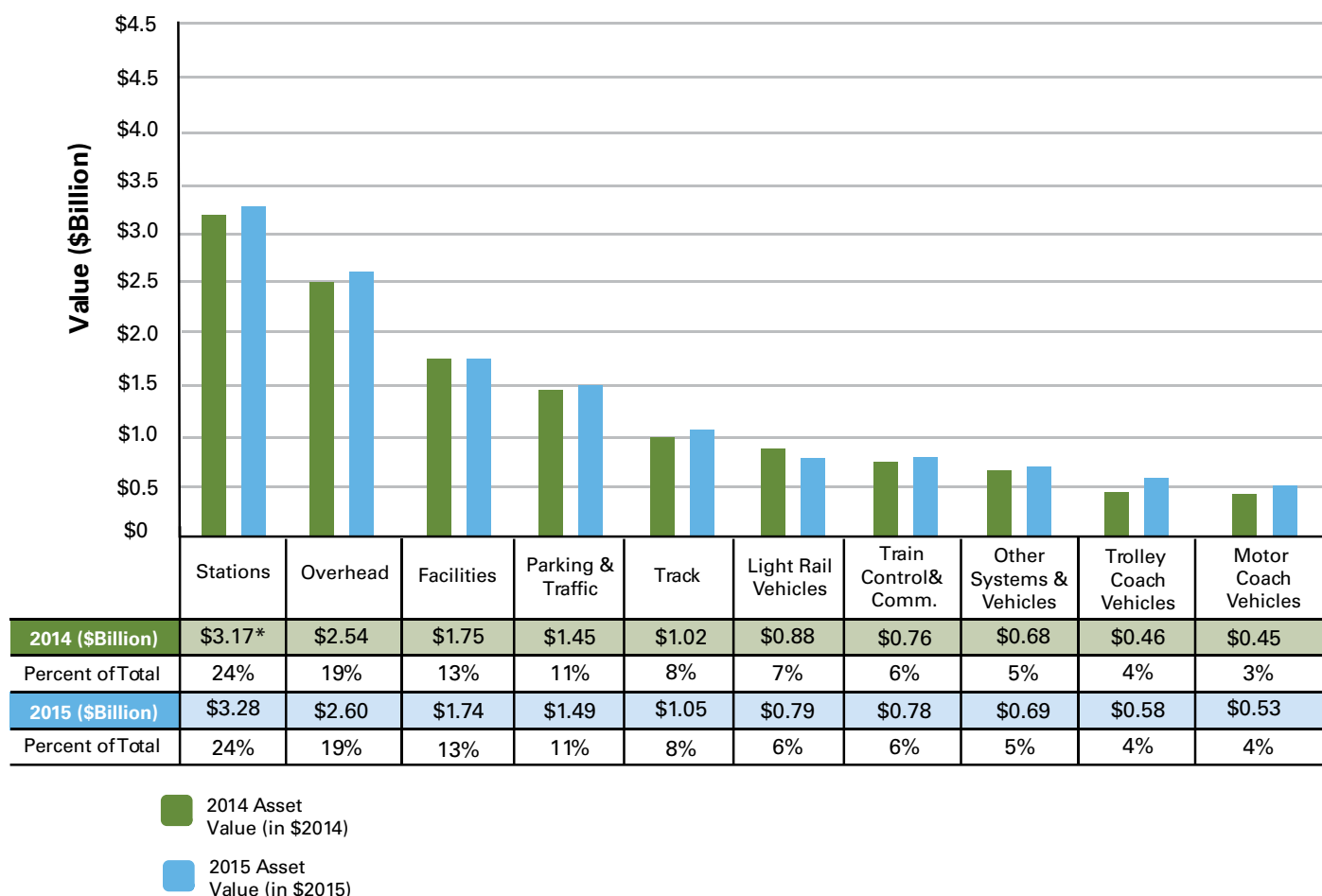


Figure 3: Total Asset Replacement Value by Asset Class, 2014 and 2015 Comparison

\*In 2015, the Stations asset class was updated to remove \$60 million in duplicate records. The 2014 value would be \$3.11 billion using the 2015 updated inventory (compared to \$3.17 billion using the 2014 inventory, as shown above).



## Estimated Backlog

To date, the SFMTA has not had the financial means to fully replace all 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 operating conditions, level of use, or other factors that would adjust the anticipated useful life of an asset.

The backlog was estimated at \$2.45 billion\* in 2014 and increased to \$2.47 billion in 2015. The overall increase in the backlog is due to insufficient resources to replace all assets as they expire. However, a number of factors influenced these changes: completed capital projects were removed from the backlog; new deferred projects were added to the backlog; and asset replacement values changed due to inventory updates made between 2014 and 2015. Moving forward, as these inventory calculations become more refined and consistent, year-over-year changes to the backlog will serve as a more informative metric for measuring SGR.

As shown in Figure 4, the SFMTA designates assets that are crucial to transit operations – such as revenue vehicles and guideway elements – as “Transit Service Critical” (TSC). Between 2014 and 2015, the TSC backlog decreased by 1%, while the backlog for all other assets increased by 2%\* in part due to inflation and improved data records. This reflects the agency’s prioritization of TSC assets for replacement and rehabilitation investments.

Figure 4 presents a side by side comparison of the 2014 and 2015 estimated backlogs.

*The backlog is the sum of all assets that have reached the end of their scheduled useful lives and have not yet been replaced.*

\*In 2015, the Stations asset class was updated to remove duplicate records and account for the completion of a number of fire detection and protection systems, which occurred in 2012. The 2014 total backlog would be \$2.33 billion using the 2015 updated inventory (compared to \$2.45 billion using the 2014 inventory, as shown in Figure 4). This would result in an 11% increase in Other SGR backlog between 2014 and 2015.

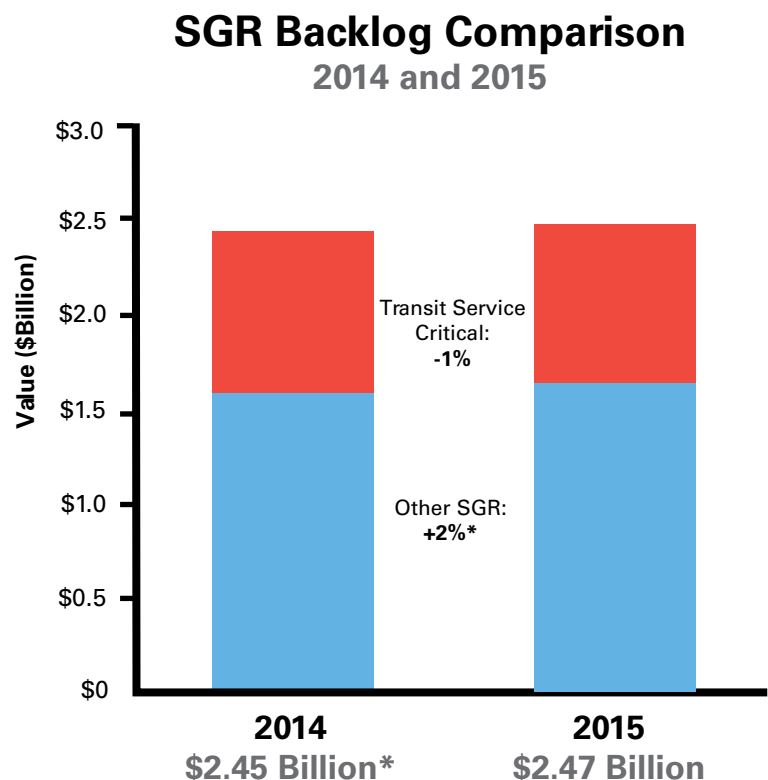


Figure 4: SGR Backlog, 2014 and 2015

## SGR 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 \$840 million in unmet need compared to \$1,635 million for Other SGR assets.

Viewing the backlog by Asset Class is important for contextualizing the asset condition scores that are given on pages 19-20 below. The SFMTA used TERM Lite modeling to rate all SFMTA assets using age-based criteria. However, while age-based asset condition scores provide a useful weighted metric for viewing the relative condition of each Asset Class, viewing the backlog by Asset Class presents an un-weighted metric for which assets require the highest dollar-amount of investment. The three largest Asset Class categories in the backlog are Parking & Traffic (\$714M), Stations (\$433M), and Facilities (\$424M), all of which are categorized as “Other SGR.”

It is important to note that the SFMTA’s 2014 Transit Fleet Management Plan was used to model the replacement schedules of revenue vehicles. Thus, while some anticipated vehicle replacements have not yet occurred, the procurement is fully funded and reflected as such in TERM Lite inputs. Upon completion of the EAM system, the SFMTA anticipates to have more up-to-date information on the in-service dates of assets.

### SGR Backlog by Asset Class \$2.47 Billion Total Need

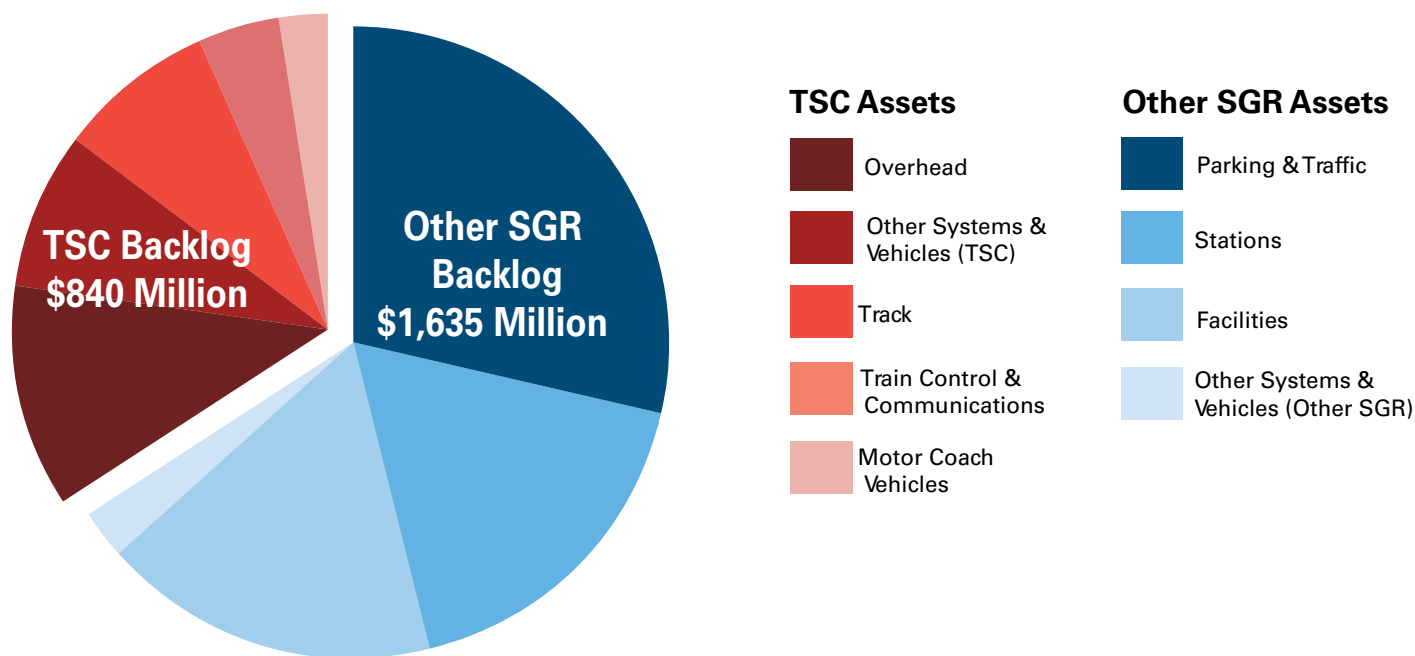


Figure 5: SGR backlog by Asset Class

## Asset Condition Scores

In addition to calculating current and future investment needs for SFMTA assets, the 2015 TERM Lite modeling also produced a “condition score” for all assets in the Asset Inventory. As noted earlier, 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 start to incorporate use-based condition data to better model the condition of SFMTA assets.

The TERM Lite condition scores below use a scale of 1 (poor) to 5 (new), with assets approaching zero as they reach the end of their scheduled useful life. In their 2010 National State of Good Repair Assessment, 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 increased from 3.24 in 2014 to 3.33 in 2015. This reflects the agency’s continued increase in SGR investments through the current Capital Improvement Program (CIP).

Figure 6 shows the Average Condition Score (ACS) for all SFMTA assets in both 2014 and 2015, shown by Transit Service Critical (TSC) and Other SGR. For 2015, TSC assets have an ACS of 3.53 compared to 3.04 for Other SGR assets, reflecting the agency’s higher level of investment in TSC assets.

### Age-Based Condition Score - Overview

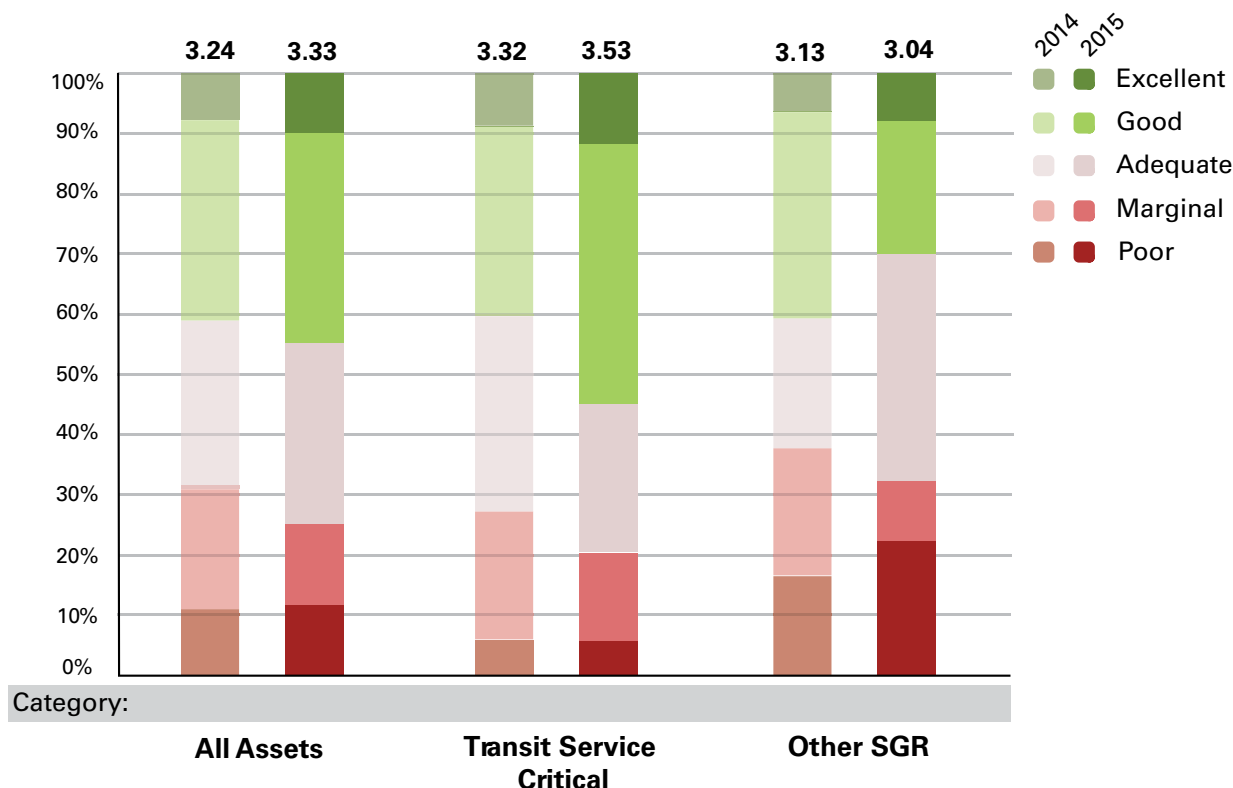


Figure 6: Age-Based Condition Score - Overview  
(Condition score based on scheduled useful life and weighted by asset value)

Figure 7 shows the Average Condition Score (ACS) by Capital Program category. This view highlights Parking and Other Systems and Vehicles as the only programs with an ACS below 2.5. With regards to Parking, the asset inventory has not yet been updated to reflect several recently completed parking projects: a major parking meter replacement project has been completed since 2010, and several parking garages are also currently under renovation. Other Systems and Vehicles is a catch-all category for those assets that do not fall into one of the SFMTA's 15 Capital Programs. This category primarily includes needs related to non-revenue vehicles. Non-revenue vehicles are addressed via SFMTA operating funds, which are not currently included in the SFMTA's SGR analysis. As stated above, the agency aims to create a system for tracking operating investments as a future update to this report.

Figure 8 looks at the Average Condition Score (ACS) by Asset Class. All SFMTA Asset Classes surpass the FTA's minimum threshold of 2.5 on a scale of 1 (poor) to 5 (new).

### Age-Based Condition Score by Capital Program

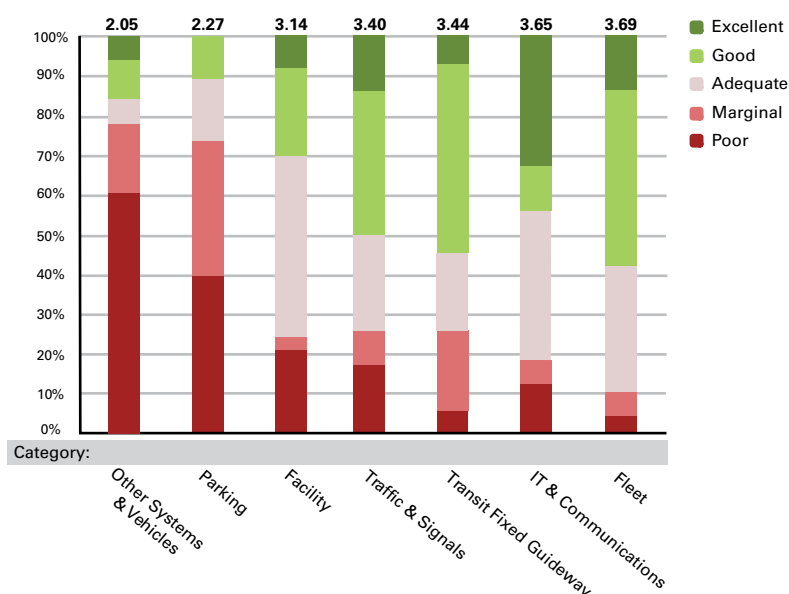


Figure 7: Age-Based Condition Score by Capital Program (Condition score based on scheduled useful life and weighted by asset value)

### Age-Based Condition Score by Asset Class

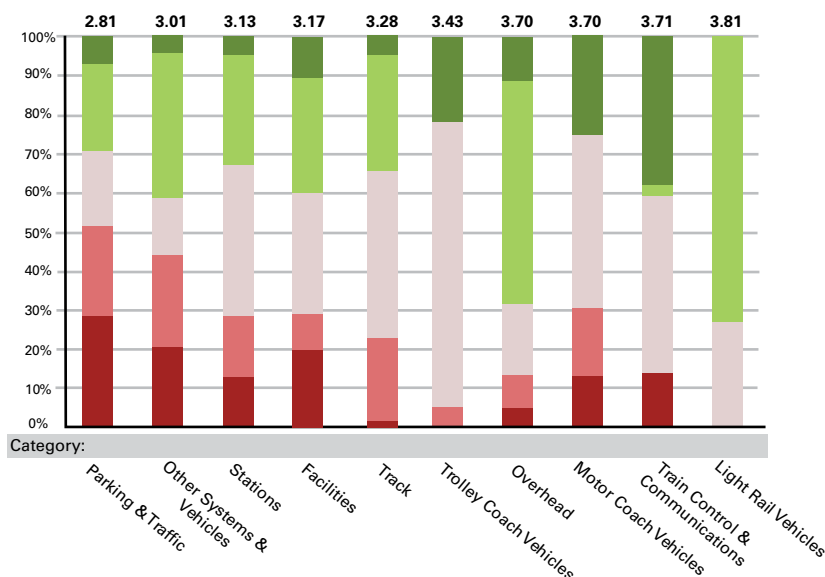


Figure 8: Age-Based Condition Score by Asset Class (Condition score based on scheduled useful life and weighted by asset value)

## 20-Year Unconstrained Needs Forecast

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 above. The current 20-Year Unconstrained Fiscal Need for State of Good Repair, not including the current backlog, is \$9.3 billion in upcoming need. Addressing all upcoming investment needs as well as the current backlog of \$2.47 billion would amount to \$11.8 billion over the next 20 years. This need is slightly higher than the reported 20 year SGR need of \$11.45 billion in the SFMTA’s 2015-2034 Capital Plan. This difference can be attributed to updates 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 horizon. Some years require a high level of investment, as major assets such as rolling stock 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 above, TERM Lite modeling does not reflect scheduling or cash-flow assumptions. Instead, the entire dollar value of an asset appears in full for the year that it expires. The high investment need that appears in 2017, 2025, 2030, and 2035 are therefore due to high-dollar assets reaching the end of their scheduled useful life during those years. In reality, the agency replaces most of its assets over multi-year procurement cycles. Part III of this report provides details on how the SFMTA plans

### \$9.3 Billion Upcoming Investment Need (\$11.8 billion including backlog)

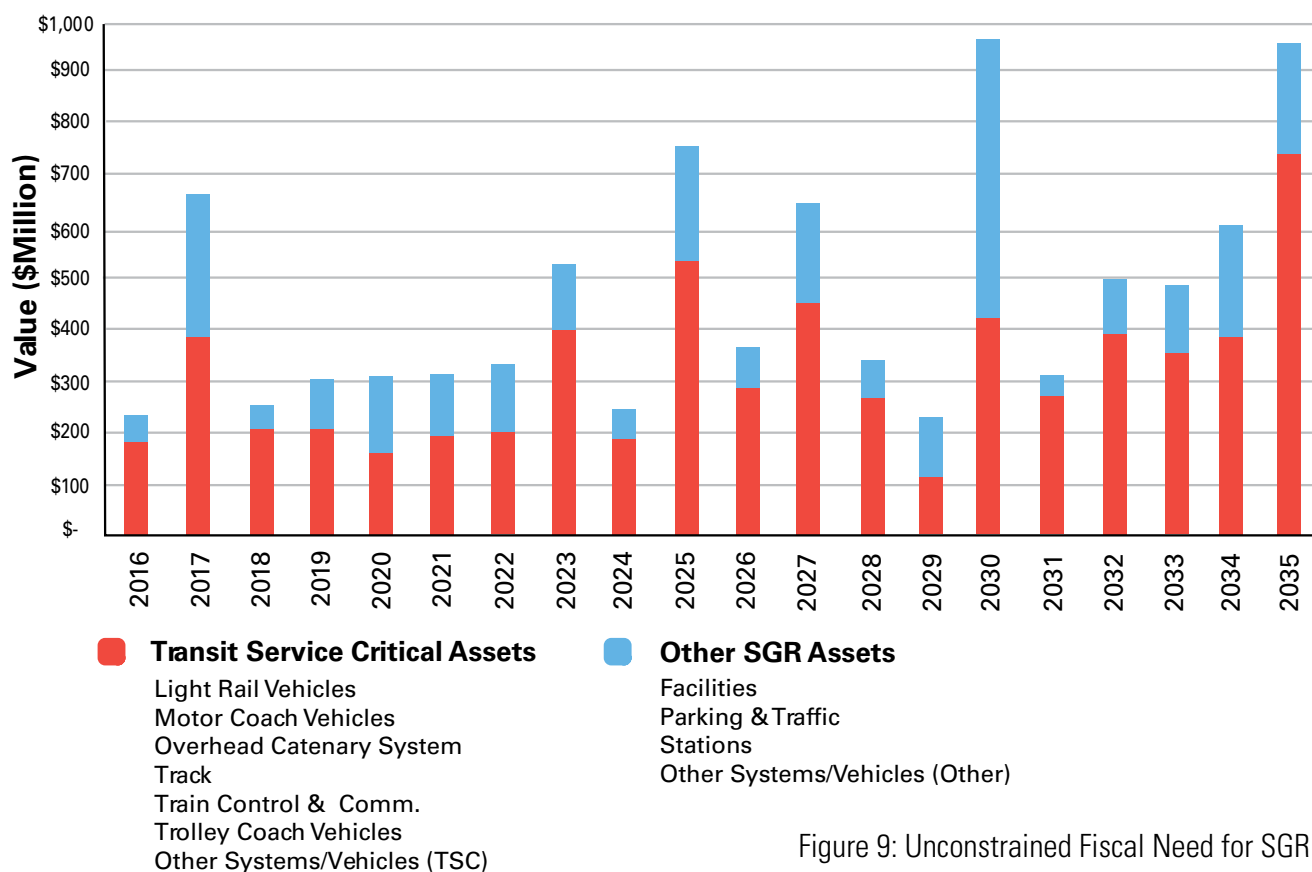


Figure 9: Unconstrained Fiscal Need for SGR

## SGR Investment Scenarios

Based on the \$11.8 billion needed in SGR investments over the next 20 years, the SFMTA would need to invest approximately \$588 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 (\$465 million annually). These needs can be further divided into \$6.3 billion needed for Transit Service Critical Assets (\$314 million annually) and \$3 billion needed for Other SGR assets (\$150 million annually).

Figure 10 presents different SGR annual investment levels and their impact on the backlog and upcoming SGR needs. As was mentioned above, the SFMTA has committed to investing an average of \$250M annually on State of Good Repair over the next 20 years. This commitment was made in 2010 as part of the full funding grant agreement with the FTA for the Central Subway project. Part III of this report explores how the SFMTA plans to meet this \$250 million annual investment goal.

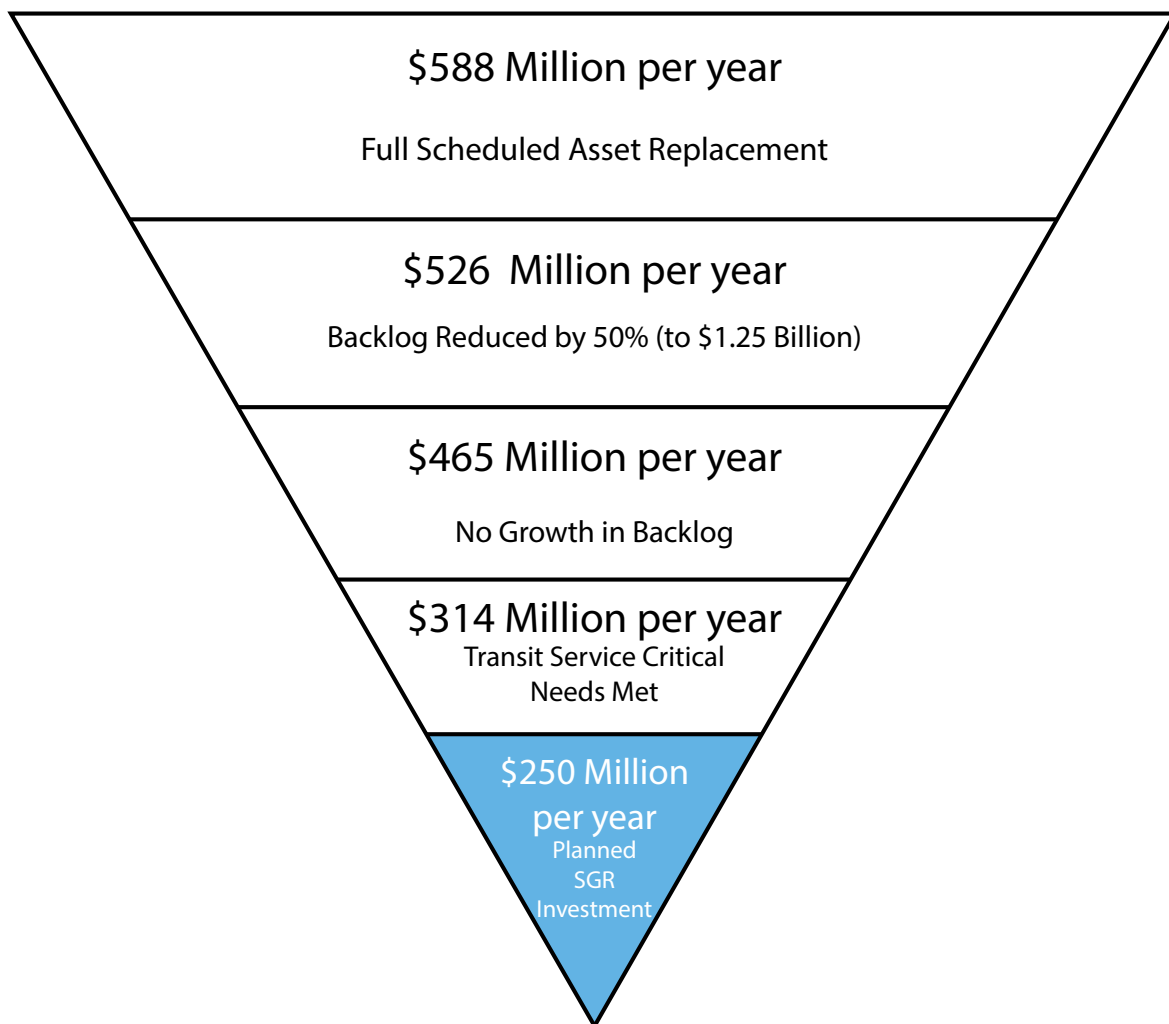


Figure 10: SGR Goals and Associated Required Investment Level

# 3.0 State of Good Repair Investments

Five-Year Outlook

Fiscal Year 2015 Investments



## Five 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 15 Capital Programs. The CIP is updated every two years concurrently with the two-year Capital Budget. The agency is currently implementing the FY 2015-2019, which was approved by the SFMTA Board in May 2014. The FY 2017-2021 CIP is under development and will be adopted in spring 2016.

### FY 2015 – 2019 CIP

The FY 2015-2019 CIP includes an average annual investment of \$316 million for State of Good Repair. This commitment remains below the \$575 million annual investment needed to fully replace all assets at the end of their scheduled useful life. However, it will address 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.



In evaluating the CIP, it is important to note that a portion of planned SGR investments are reliant on currently non-committed sources, such as state and federal competitive grant initiatives. The agency's \$316 million annual SGR commitment outlined in the FY 2015-2019 CIP is therefore partly contingent on anticipated revenue sources that have not yet 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, un-anticipated 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 investment throughout the year to track against planned investments outlined in the CIP.

The SFMTA's planned investment of \$316 million annually over the FY 2015-2019 CIP, combined with \$180 million average annual investment between 2010-2014, is expected to bring the agency's total average annual investment in line with the \$250 million per year that the SFMTA has committed to delivering.



## FY 2017-2021 CIP

The SFMTA is currently developing the FY 2017-2021 CIP, which will be presented to the SFMTA Board for approval in spring 2016. This updated CIP will continue to prioritize SGR investments, specifically in those asset class categories that the SFMTA has categorized as Transit Service Critical.

Several key developments are anticipated for the FY 2017-2021 CIP. For example, the city was successful in passing two key revenue measures – Propositions A and B - in the November 2014 general election\*. While these revenue measures were programmed at a conservative level in the FY 2015-2019 CIP, they were still uncertain. The agency is now able to fully program these sources for the FY 2017-2021 CIP.

The SFMTA will also begin to track SGR investments at a more detailed project level. A full build-out of the agency's Capital Program Controls System (CPCS) is currently underway. In addition to tracking schedule and cost information for capital projects, this system will allow the agency to start tracking SGR investments on a more nuanced project-by-project basis.

Finally, the agency will also begin to incorporate the proposed FTA rulemaking on Transit Asset Management (TAM) planning and reporting during the FY 2017-2021 CIP cycle.

\* The Proposition A Transportation and Road Improvement Bond provides \$500 million for transportation infrastructure needs across San Francisco. The Proposition B General-Fund set-aside increased the annual base contribution to the SFMTA from the city's general fund; Proposition B will provide approximately \$160 million over the FY 2017-2021 CIP cycle.

# Fiscal Year 2015 Investments

The SFMTA recently closed out the first fiscal year of the FY 2015-2019 CIP. Of \$438 million in SGR investments planned for FY 2015, the agency booked \$364.6 million into projects and spent a total of \$141.5 million on maintaining a state of good repair.

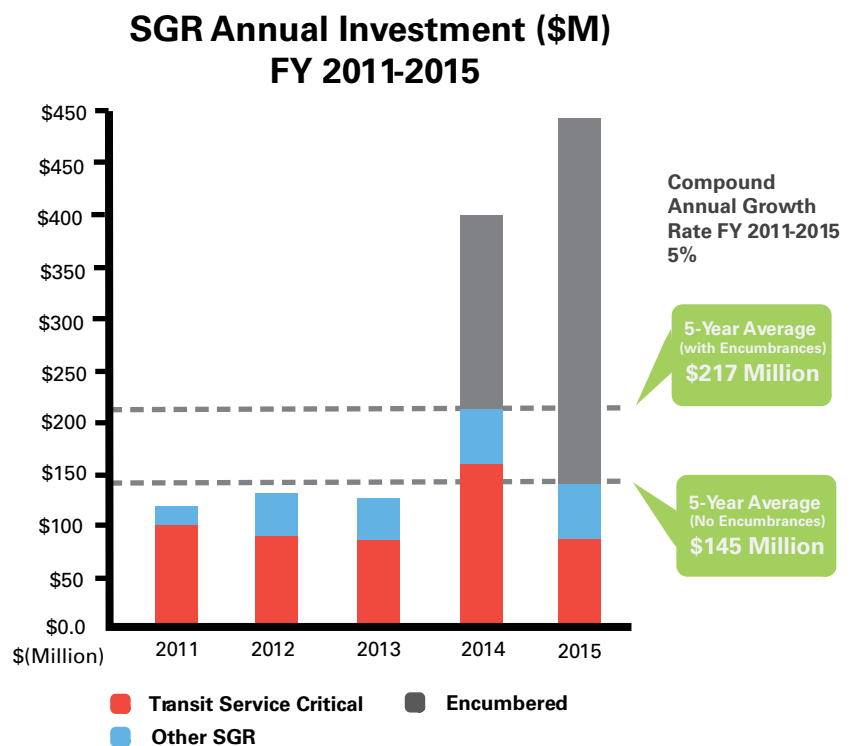
Although FY 2015 expenditures were below the agency’s \$250 million benchmark, the total funding booked to SGR projects exceeded \$250 million by forty-five percent (see ‘YTD SGR Funds Secured’ in the investment dashboard below). These booked funds will be spent down in upcoming years as recently initiated SGR projects are constructed and closed out.

It is important to note that nearly thirty percent of planned SGR investment in the FY 2015-2019 CIP was programmed for FY 2015. In future CIP cycles, the agency plans to better match cash-flow to project schedules, which would distribute funding more evenly across the five-year horizon. This would allow for more accuracy in tracking expenditures against planned investments, as the first year of the CIP cycle would not be disproportionately higher than following years.

Despite a drop in total expenditures from FY 2014 to FY 2015, average annual investment continues to grow. As was stated above, it is important to view SGR investments over a multi-year timeframe, as the agency’s SGR needs – as well as project delivery capacity – fluctuates from year-to-year.

The overall increase in investment over the last two fiscal years has brought the agency’s average annual investment to \$217 million (including encumbered funds) for the FY 2011-2015 five-year period. This represents a twenty percent increase from the FY 2010-2015 five-year period, which saw an average annual investment of \$180 million. See page 28 for a list of key SGR investments made in FY 2015.

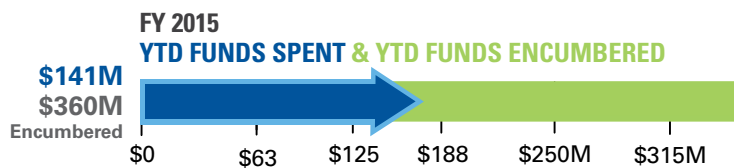
Figure 11: SGR Annual Investment: 2011 - 2015



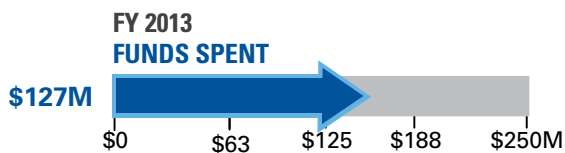
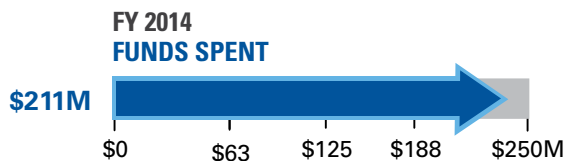
# Fiscal Year 2015 Investment Dashboard

Capital Program	FY 2015 - 2019 Planned Investment	FY 2015 - 2019 Planned SGR Investment	FY 2015 Planned SGR Investment	YTD SGR Funds Secured	YTD SGR Funds Spent
Accessibility	\$15,067,000	\$15,067,000	\$500,000	\$7,574,000	\$631,000
Bicycle	\$119,187,000	\$23,837,000	\$6,692,000	\$4,190,000	\$1,024,000
Central Subway	\$792,899,000	--	--	--	--
Communications/IT Infrastructure	\$44,378,000	\$44,378,000	\$36,946,000	\$16,926,000	\$27,149,000
Facility	\$134,903,000	\$134,903,000	\$52,153,000	\$19,544,000	\$8,869,000
Fleet	\$1,080,278,000	\$864,222,000	\$183,998,000	\$182,061,000	\$25,791,000
Parking	\$41,080,000	\$41,080,000	\$32,713,000	\$28,972,000	\$20,142,000
Pedestrian	\$70,827,000	\$7,083,000	\$1,550,000	\$517,000	\$360,000
School	\$10,901,000	--	--	--	--
Security	\$33,263,000	\$33,263,000	\$7,121,000	\$7,043,000	\$7,738,000
Taxi	\$3,910,000	--	--	--	--
Traffic Calming	\$22,801,000	\$2,280,000	\$714,000	\$807,000	\$337,000
Traffic/Signals	\$74,624,000	\$74,624,000	\$18,340,000	\$19,766,000	\$12,467,000
Transit Fixed Guideway	\$217,738,000	\$217,738,000	\$72,037,000	\$72,037,000	\$33,421,000
Transit Optimization/Expansion	\$652,662,000	\$130,532,000	\$25,134,000	\$5,262,000	\$3,536,000
<b>Grand Total</b>	<b>\$3,314,516,000</b>	<b>\$1,589,006,000</b>	<b>\$437,900,000</b>	<b>\$364,699,000</b>	<b>\$141,465,000</b>

## PROGRESS TRACKER



The SFMTA will continue to update the investment dashboard above on a quarterly basis to track the agency's progress towards meetings its SGR investment goals.



# Key SGR Investments: Fiscal Year 2015

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

## Fleet Rehabilitation & Replacement

- New Articulated Trolley Coaches are starting to arrive and be put into revenue service (60 replacement trolley buses are anticipated to be delivered by March 2016).
- New Articulated Hybrid Motor Coaches are starting to arrive and be put into revenue service (76 replacement motor coaches are anticipated to be delivered by July 2016).
- 89 Light Rail Vehicles and 80 Neoplan buses were restored and returned to revenue service.
- 35 new paratransit vehicles have been procured to replace outdated vehicles.

## Information Technology Upgrades

- Completed 100% design review for one of five antennae sites for the ITS Radio Replacement project.
- Installed Platform Display Sign (PDS) supports at the platform level of seven subway stations.
- Initiated cabling work (e.g. installation/testing/termination) at Castro and Church Station for the C3 Blue Light Emergency Phone Replacement.
- Completed wiring installation for the Automatic Train Control System (ATCS) for one of the five interlock locations to replace outdated systems.

## Traffic Signal & Street Improvements

- Installed new traffic signals at 11 intersections citywide.
- Implemented pedestrian safety improvements at locations citywide, including:
  - 348 Continental Crosswalks
  - 60 Painted Safety Zones
  - Pedestrian Countdown Signals in 36 intersections
  - Accessible Pedestrian Signals in 24 intersections

## Subway & Fixed Guideway Projects

- Began construction on the Sunset Tunnel Trackway Improvement Project.
- Completed 100% design for pole replacement and overhead reconstruction on the 33 Stanyan along 18th Street between 16th and 25th Streets (Phase I). Completed 65% design for Phase II (curb ramps along 18th Street between Castro and Mission Streets).
- Completed the Conceptual Engineering Report for M Oceanview Track Replacement Project at 19th Ave. and Rossmoor Dr.
- Completed 95% design for the Muni Forward West Portal/St. Francis Circle Project, which includes repaving of the track way, installation of vetag loops and upgraded transit signal systems.
- Completed the first draft of the pre-development report for the L Taraval OCS and Track Replacement.
- Completed contract document for Twin Peaks Tunnel Rail Replacement.
- Initiated framework for RFP for the Rail Grinding Phase I project.
- Awarded the construction contract for the Balboa Park Station Area and Plaza Improvements Project, which includes a full upgrade of a train interlocking system at Ocean Ave.

## Facilities

- A construction contract was awarded for the second phase of the Islais Creek Maintenance Facility, which will include new storage and maintenance facilities for hybrid motor coaches.
- Completed rail installation at Area 1A for the Green Center Rail Replacement project
- Completed various improvements to enhance security of bus and rail yards, including:
  - Replaced Gate Operators at Geneva Division
  - Repaired/replaced fencing and barbed wiring at six facilities
  - Installed portable motion detectors at the entrances of five facilities

# 4.0 Future Steps for State of Good Repair



# 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 the SFMTA. This group intends to develop agency-wide project delivery standard operating procedures as well as better define roles and responsibilities across different divisions.

### **Fund-By-Phase Capital Financing**

The SFMTA is increasingly allocating funds on a phase-by-phase basis to improve cash-flow, speed project delivery times, and free up funds for pre-development phases of projects.

### **Pre-Development Funding**

As part of the fund-by-phase model, the agency is also increasing its investment in pre-planning phases in order to better develop scope, schedules, and budgets for capital projects. This will help with long-range planning efforts and the development of the Capital Improvement Program (CIP).

### **Project Integration Process**

In 2014, the SFMTA began full implementation of a Project Integration Process (PIP) 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 15 Capital Programs that reviews project scopes to identify potential project integration opportunities based on existing plans, policies, and projects. The PIP is intended to begin when a project is in the early planning and design phase.

### **New Project Management Technology: Envista**

Envista is an on-line spatial database that will help to facilitate coordination between the SFMTA, other public agencies, and private utility companies. Envista is designed to track data regarding basic project scopes and schedules for any project that involves breaking ground (i.e. modifying roads or closing sidewalks), or that would benefit from multi-departmental coordination. As of October 2014, the SFMTA has uploaded the FY 2015-2019 Capital Improvement Program (CIP) into Envista.

## Transportation Asset Management (TAM)

The SFMTA is working to implement a Transportation Asset Management (TAM) program to better assess and prioritize the agency's SGR needs. Specifically, the goals of the TAM program are:

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

To achieve these goals, the agency will proactively coordinate all asset lifecycle activities in a manner that is guided by international standards on asset management practice and obligations to meet regulatory requirements. The TAM program is being developed alongside recent Federal Transit Administration (FTA) guidance and upcoming rulemaking on asset management. A key element of the agency's TAM program is the implementation of the agency's Enterprise Asset Management System (EAMS).

## Enterprise Asset Management System

The Enterprise Asset Management System (EAMS) is currently in implementation and will enable agency-wide asset tracking, work management, and materials management. 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 of all lifecycle costs associated with each asset. These improvements will support asset renewal/replacement programs and allow for better financial forecasting and planning.

The SFMTA plans to deploy the EAMS across approximately 45 business units within the agency by late 2017. Over the next year, the SFMTA and 21 Tech Consulting will complete system set-up and basic configuration, and complete the implementation with the Maintenance-of-Way Division and a number of other transit maintenance units. In subsequent years, the agency will also deploy the system in the Sustainable Streets (parking, traffic, bicycle, and pedestrian assets) and Transit (fleet) divisions.



# Appendices

## **Appendix A: 2015 Inventory and Backlog Updates**

The following list captures the changes made to the SFMTA Capital Asset Inventory, also known as the State of Good Repair (SGR) Database, following the publication of the 2014 State of Good Repair Report, through 6/30/2015. These changes are reflected in the analysis that are reported in the 2015 State of Good Repair. The changes are grouped by Capital Program:

### **Facilities**

- Retirement of 901 Rankin Facility
- Addition of one new ADA boarding platform and rebuild of two boarding platforms
- Update to unit replacement costs and useful life values of elevators and escalators (substantial increases based on recent capital projects)
- Addition of new equipment for backup power at subway stations
- Construction of four new permanent operator restrooms
- Data refinement, removal of:
  - Facility – Training Center - \$45M
  - Facility – Seismic Retrofit @1401 Bryant - \$25M
  - Stations – Seismic Retrofit Study - \$584k
  - Stations – Standardized elevator and escalator records - \$54M (itemized records now in use)
  - Stations – Updated records for seven fire detection and protection systems to reflect 2012 installations, resulting in a backlog decrease of \$61M

### **Fleet**

- Expansion of 60-ft motor coach fleet by 35 vehicles
- Expansion of 40-ft motor coach fleet by 14 vehicles
- Update to paratransit vehicle fleet inventory (first update since 2009)
- Update to unit replacement cost of LRVs, motor coaches, trolley coaches to reflect recent contract

### **IT/Communications**

- Installation of station LED displays
- Installation of fiber optic cable in the Subway

### **Transit Fixed Guideway**

- Addition of three previously undocumented pieces of light rail special work
- Replacement of eight pieces of light rail special work
- Replacement of overhead catenary system during the Castro Street Redesign

### **Other Systems and Vehicles**

- Update of non-revenue vehicle fleet Inventory (first since 2009)



# Appendix B:

## 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 polices, 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.

# Appendix C:

## Select Capital Project Scopes, FY 2015-2019 Capital Improvement Program (CIP)

### **Blue Light Phone Emergency**

#### *Communications & IT Technology / Transit Fixed Guideway*

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**

#### *Communications & IT Technology*

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**

#### *Facility*

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**

#### *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**

#### *Fleet*

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**

### *Fleet*

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**

### *Transit Fixed Guideway*

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**

### *Transit Fixed Guideway*

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**

### *Transit Fixed Guideway*

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**

### *Transit Fixed Guideway*

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**

### *Traffic & 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**

### *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**

### *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**

### *Transit Optimization & Expansion*

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**

### *Transit Optimization & Expansion*

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.

## Appendix D:

### Planned Investments by Capital Program: All Investments FY 2015-2019 Capital Improvement Program (CIP)

Includes State of Good Repair, Expansion Projects & Enhancements Projects  
All amounts shown in Millions (\$M)

Capital Program	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	CIP Total
Central Subway	\$203.4	\$190.9	\$150.0	\$150.0	\$98.5	\$792.9
Security	\$7.1	\$10.1	\$10.1	\$3.0	\$3.0	\$33.3
Bicycle	\$33.5	\$35.5	\$23.5	\$12.6	\$14.2	\$119.2
Pedestrian	\$15.5	\$18.3	\$13.4	\$10.4	\$13.3	\$70.8
Transit Optimization/ Expansion	\$125.7	\$162.4	\$193.3	\$53.6	\$117.6	\$652.7
Traffic/Signals	\$18.3	\$24.9	\$17.3	\$9.6	\$4.5	\$74.6
Transit Fixed Guideway	\$72.0	\$33.6	\$30.3	\$27.1	\$54.7	\$217.7
Fleet	\$230.0	\$321.0	\$199.7	\$205.0	\$124.5	\$1,080.3
Facility	\$52.2	\$45.8	\$35.0	\$1.0	\$1.0	\$134.9
Traffic Calming	\$7.1	\$9.1	\$2.8	\$2.2	\$1.4	\$22.8
Parking	\$32.7	\$8.4	--	--	--	\$41.1
School	\$3.7	\$4.5	\$2.7	\$0.0	\$0.0	\$10.9
Taxi	\$0.9	\$0.8	\$0.8	\$0.8	\$0.8	\$3.9
Accessibility	\$0.5	\$1.2	\$4.2	\$3.7	\$5.5	\$15.1
Communications/ IT Infrastructure	\$36.9	\$4.0	\$1.6	\$0.9	\$0.9	\$44.4
<b>Total</b>	<b>\$839.6</b>	<b>\$870.3</b>	<b>\$684.7</b>	<b>\$479.9</b>	<b>\$440.0</b>	<b>\$3,314.5</b>

## Appendix E:

### Planned SGR Investments by Capital Program FY 2015-2019 Capital Improvement Program (CIP)

All amounts shown in Millions (\$M)

Capital Program	CIP Total (\$M)	SGR Total (\$M)	SGR Category
Accessibility	\$15.1	\$15.1	Other
Bicycle	\$119.2	\$23.8	Other
Central Subway	\$792.9	--	--
Communications/IT Infrastructure	\$44.4	\$44.4	TSC
Facility	\$134.9	\$134.9	Other
Fleet	\$1,080.3	\$1,080.3	TSC
Parking	\$41.1	\$41.1	Other
Pedestrian	\$70.8	\$7.1	Other
School	\$10.9	--	--
Security	\$33.3	\$33.3	Other
Taxi	\$3.9	--	--
Traffic Calming	\$22.8	\$2.3	Other
Traffic/Signals	\$74.6	\$74.6	Other
Transit Fixed Guideway	\$217.7	\$217.7	TSC
Transit Optimization/ Expansion	\$652.7	\$130.5	Other
<b>Total</b>	<b>\$3,314.6</b>	<b>\$1,805.1</b>	

# Appendix F:

## Capital Program by SGR Investment Level FY 2015-2019 Capital Improvement Program (CIP)

Capital Program FY 2015 - 2019 CIP	SGR Investment Level (EST)
1. Accessibility	100%
2. Communications & IT	100%
3. Facility	100%
4. Security	100%
5. Traffic & Signals	100%
6. Transit Fixed Guideways	100%
7. Parking	100%
8. Fleet	80%
9. Bicycle	20%
10. Transit Optimization & Expansion	20%
11. Traffic Calming	10%
12. Pedestrian	10%
13. Central Subway	0%
14. School	0%
15. Taxi	0%



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