



State of Good Repair Report

San Francisco Municipal Transportation Agency
Annual State of Good Repair Report

Published February 2015



SFMTA
Municipal
Transportation
Agency

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Executive Summary

The San Francisco Municipal Transportation Agency's 2014 State of Good Repair Report is intended to provide a comprehensive analysis of the agency's rehabilitation and replacement needs and investments. It is also intended to provide greater transparency regarding the agency's asset management practices, project delivery methods, and project prioritization criteria.

This document builds upon the 2010 State of Good Repair (SGR) Report, which was the first such report published by the San Francisco Municipal Transportation Agency (SFMTA). The 2010 report introduced the agency's asset management program, outlined the 2009 Asset Inventory, and defined prioritization criteria for capital projects. Since 2010, the SFMTA has continued to refine its asset management practices and prioritization criteria for funding capital projects to better allocate SGR investments.

The 2014 State of Good Repair Report will focus 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 of this document introduces the SFMTA, outlines the agency's capital planning process, and defines State of Good Repair. Part II focuses on the SFMTA's 2014 SGR analysis, including: comparison to the 2010 analysis, asset condition modeling, and the agency's financial ability to invest. Part III explains how the SFMTA is addressing SGR needs, including a five-year and one-year outlook for allocated SGR investments. 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 \$2.5 billion. Since 2010, the SFMTA has spent an average of **\$180 million annually**** on State of Good Repair. In May 2014, the SFMTA Board approved the Fiscal Year (FY) 2015-2019 Capital Improvement Program (CIP), which increases the agency's allocated SGR investment to an average of **\$316 million annually**. This increased rate of investment, when viewed in context with the last five years of spending, will keep the SFMTA on track to meet its \$250 million annual SGR commitment.

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's FY 2015-2019 CIP includes \$1.5 Billion in SGR expenditures out of a total investment of \$3.3 Billion 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 \$141M for expenditures only (excluding encumbered funds).

The agency is currently introducing extensive changes to project delivery methods that will increase the efficiency and effectiveness of SGR investments, including: increased pre-development funding for projects, a Capital Program Control System with real time performance metrics, and a new “fund-by-phase” model 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 plans to publish a State of Good Repair Report annually to demonstrate progress on the SGR initiatives presented herein. Some aspects of this report, such as the one-year outlook and “investment dashboard”, will be updated quarterly to measure the agency’s on-going progress toward meeting State of Good Repair investment goals.



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 5,000 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 Program has set forth goals that are consistent with the Federal Transit Administration's guidance under *Moving Ahead for Progress in the 21st Century (MAP-21)*. These goals also support the SFMTA Strategic Plan:

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

In support of these goals, the agency maintains a Capital Asset Inventory to manage investment needs. Various prioritization factors are used to assess these needs, which are then addressed via 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 the next 20 years. This was a condition of the full funding grant agreement with the FTA for the Central Subway project. This goal is intended to ensure that the agency balances its resources effectively between maintaining a state of good repair with enhancing and expanding the transportation system. See page 21 for more detailed information on the impact of various funding levels on State of Good Repair.

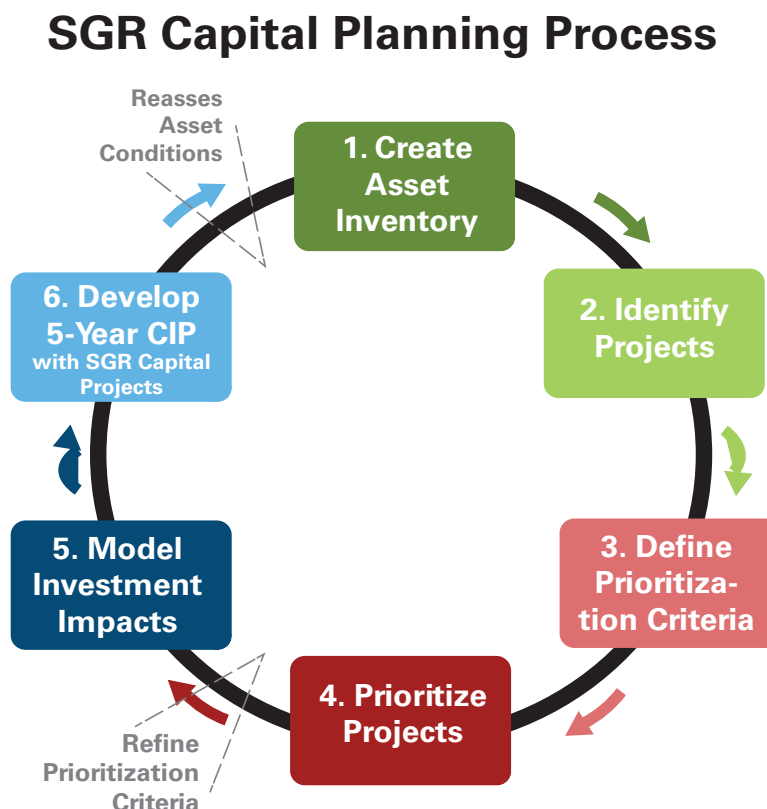


Figure 1: SGR Capital Planning Process

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 SFMTA's **20-year Capital Plan** captures all of the SFMTA's anticipated capital needs for the upcoming twenty years. It is a financially unconstrained plan, meaning that it is not limited to capital needs for which funding has already been identified. The purpose of the Capital Plan is to identify and prioritize all of the agency's capital investment needs. All projects in the Capital Plan are prioritized based on the goals and objectives of the SFMTA Strategic Plan.

The most current Capital Plan, which is formally updated every two years, was adopted by the SFMTA Board in October 2013. It identified \$15.7 billion in capital needs, which includes all potential SFMTA capital investments. Of this total, approximately \$10 billion is needed for the ongoing replacement and renewal of the agency's existing assets (SGR needs). 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).

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

The FY 2015-2019 CIP was adopted by the SFMTA Board in May 2014, and 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.

Categorizing Investment Needs

At a high level, the SFMTA categorized all assets into distinct Asset Classes as part of developing its first comprehensive Capital Asset Inventory in 2009. 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.

In tandem with regional practices, the SFMTA also categorizes SGR needs by **Transit Service Critical (TSC)** and **Other SGR**. Transit Service Critical is defined as asset 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 needs include investments that help 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	<ol style="list-style-type: none"> 1. Light Rail Vehicles 2. Motor Coach Vehicles 3. Overhead Catenary System 4. Track 5. Train Control & Communications 6. Trolley Coach Vehicles 7. Other Systems/Vehicles (TSC) 	<ol style="list-style-type: none"> 1. Transit Fixed Guideway 2. Fleet 3. Communications & IT
Other SGR	<ol style="list-style-type: none"> 8. Facilities 9. Parking & Traffic 10. Stations 11. Other Systems/Vehicles (Other) 	<ol style="list-style-type: none"> 4. Facility 5. Accessibility 6. Pedestrian 7. Bicycle 8. Traffic Calming 9. Security 10. Traffic & Signals 11. Parking 12. Transit Optimization & Expansion
Non-SGR		<ol style="list-style-type: none"> 13. Central Subway 14. School 15. Taxi

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 to enhance or expand the transportation network. However, new assets that are introduced to the transportation system through expansion projects are added to the Capital Asset Inventory either upon completion or based on inclusion in long-range planning documents. This ensures that they will be included in future assessments of the agency's rehabilitation and replacement needs.

In calculating yearly SGR investment, the SFMTA analyzes planned expenditures at both a project-level and Capital Program-level. Some Capital Programs are entirely comprised of SGR investments; 100% of that Capital Program is therefore 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. The 2014 analysis included in this report bases SGR investment on Capital Program-level assumptions. Moving forward, the agency will continue to refine its calculation of SGR investments at a more fine-grain project level. See Appendix E 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. At this time, 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 in State of Good Repair as part of its Asset Management Program.

In conducting its 2014 SGR analysis, the SFMTA used the Transit Economic Requirements Model Lite (TERM Lite), the Federal Transit Administration (FTA) recommended SGR Analysis tool. This tool is similar to the FTA's TERM software for evaluating need at the national level, but is optimized to be run by individual agencies. 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 2014 TERM Lite analysis results 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

2014 State of Good Repair Findings

Total Cost of State of Good Repair



Capital Asset Inventory Background

2010 State of Good Repair Report

In 2009, the SFMTA kicked off its Capital Asset Management Program with the development of its first comprehensive Capital Asset Inventory. The program was intended to support agency, regional, and national-level capital planning efforts, and the inventory provided a foundation for the agency's first State of Good Repair report in 2010. The resulting inventory reflected an extensive effort that engaged many agency divisions in collecting asset information, including age, replacement cost, and scheduled useful life. 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.

Although many of the assets documented in 2010 were transit-related, other recorded categories of assets included non-transit facilities, parking-related infrastructure, traffic signals and non-revenue vehicles. In some cases, the data gathered was at a very fine level of detail (i.e. data by specific vehicle type). Other times, assets were documented as a higher-level group of assets (such as grouping individual rail segments by line). For these coarsely defined items, a single line item in the data set with age, standard replacement cost and scheduled useful life represents the entire group of assets. In total the agency identified over 3600 asset items in the 2009-2010 asset inventory process.

Updates to the Asset Inventory (2010 – 2014)

Following the completion of the 2010 report, 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. In 2011, the SFMTA worked with the Metropolitan Transportation Commission (MTC) and C2HM Hill to make these updates, which fed into the MTC's Regional Transit Capital Inventory (RTCI). The RTCI is used to forecast SGR needs for all of the Bay Area's transit agencies and is reported in the Regional Transportation Plan, called Plan Bay Area.

In 2014, the SFMTA's Capital Asset Inventory was updated again, this time to reflect the completion of SGR-related transit projects by the agency's Capital Planning and Construction (CP&C) and Fleet Engineering divisions between 2010 and 2014. Examples of these projects included rail replacement, facility rehabilitation, and fleet replacements. Capital work completed by SFMTA's other divisions, such as Sustainable Streets, was not reflected in this inventory update.

See Appendix A for a list of specific inventory updates made in 2011 and 2014.

Capital Asset Inventory Next Steps

The SFMTA is continuing to refine its Capital Asset Inventory. Below is a summary of key improvements that the agency plans to implement in the 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. Develop and implement a process to capture replacement and rehabilitation of assets as they happen.
3. Move from a coarse-grain inventory to a fine-grain inventory, particularly in the areas of vehicles, overhead catenary system, track, and facilities. This will support tracking of SGR investments from the operating budget.
4. Add existing assets that are not already in the inventory, including pedestrian and bicycle infrastructure.
5. Refine per unit costs by asset, and develop a process for evaluating replacement cost.
6. Further refine rehabilitation schedules in the inventory based on actual planned schedule.
7. Inclusion of planned changes to the Revenue Vehicle Fleet, as documented in the 2014 SFMTA Fleet Plan.
8. 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.
9. Conduct risk assessments and multi-variable condition assessments for all assets to support more precise SGR evaluation and more data-driven project prioritization.



SGR Needs Analysis Background

2010 State of Good Repair Report

The 2010 State of Good Repair Report was based upon the 2009 Capital Asset Inventory, which calculated asset condition based on asset age relative to scheduled useful life. The SFMTA used the *SGR Model*, a tool developed by AECOM for the Massachusetts Bay Transportation Authority (MBTA). The model's needs forecasts were informed by standardized project cash flow data that was developed for each SFMTA Asset Class. As such, it distributed funding needs for capital projects that take multiple years to complete over the appropriate time frame. In addition to calculating current and future SGR needs, the model also allowed for investment scenario testing, including scenarios based on asset age and agency priority.

The *SGR Model* analyzed both financially unconstrained and financially constrained modeling scenarios. For the financially unconstrained scenario, the model assumes that all deferred needs (assets that are overdue for replacement) are addressed first, and only constrained by the project delivery schedules. For financially constrained scenarios, the model assesses the impact of limited investment capabilities and project prioritization. SFMTA analysis explored the impacts of different funding scenarios as well as the impact of varying the weighting of age-based condition and agency-determined prioritization factors.

2014 State of Good Repair Analysis

The 2014 State of Good Repair analysis is based on the agency's 2014 Capital Asset Inventory, which 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. In this updated analysis, the SFMTA used the Federal Transit Administration's TERM Lite modeling program to calculate current and future SGR investment needs. TERM Lite differs from AECOM's *SGR Model* in several respects. One key difference is that TERM Lite 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 time needed to deliver the project.

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, the SFMTA will incorporate additional factors into condition scoring. This refined condition scoring, paired with upcoming risk assessment data (such as criticality and vulnerability), will support more precise SGR assessments and more data-driven project prioritization. These efforts will become available alongside the SFMTA's Enterprise Asset Management System (EAMS), which is due to roll out as a prototype in late 2017.

2014 State of Good Repair Findings

Total Asset Replacement Value

The first step to calculating future investment need is to define the SFMTA's current total asset replacement value. The 2010 State of Good Repair analysis calculated a total asset replacement value of \$14.6 billion; that value decreased to \$13.2 billion in 2014. The SFMTA did not complete any significant expansion projects or dispose of major assets between 2010 and 2014. Differences between the 2010 and 2014 asset replacement value are therefore driven by updates made to the Capital Asset Inventory, as was explained above (page 12). For example, refinements made to replacement cost estimates and the addition of previously undocumented assets to the asset inventory.

Figure 3 shows a comparison of asset replacement values calculated in 2010 and 2014, shown by Asset Class. The most significant changes between the 2010 and 2014 replacement values are: 1) reduced asset replacement value for the Overhead asset class due to updated cost estimates, and 2) the increased asset replacement value of the Stations asset class due to adding several missing assets.

Total Asset Replacement Value Comparison

2010 (\$14.6B) & 2014 (13.2B)

*All Amounts Shown in 2014 Dollars

2010 Asset Value
2014 Asset Value

Note: Value changes are due primarily to further completion of the asset inventory and improvements to replacement cost estimates

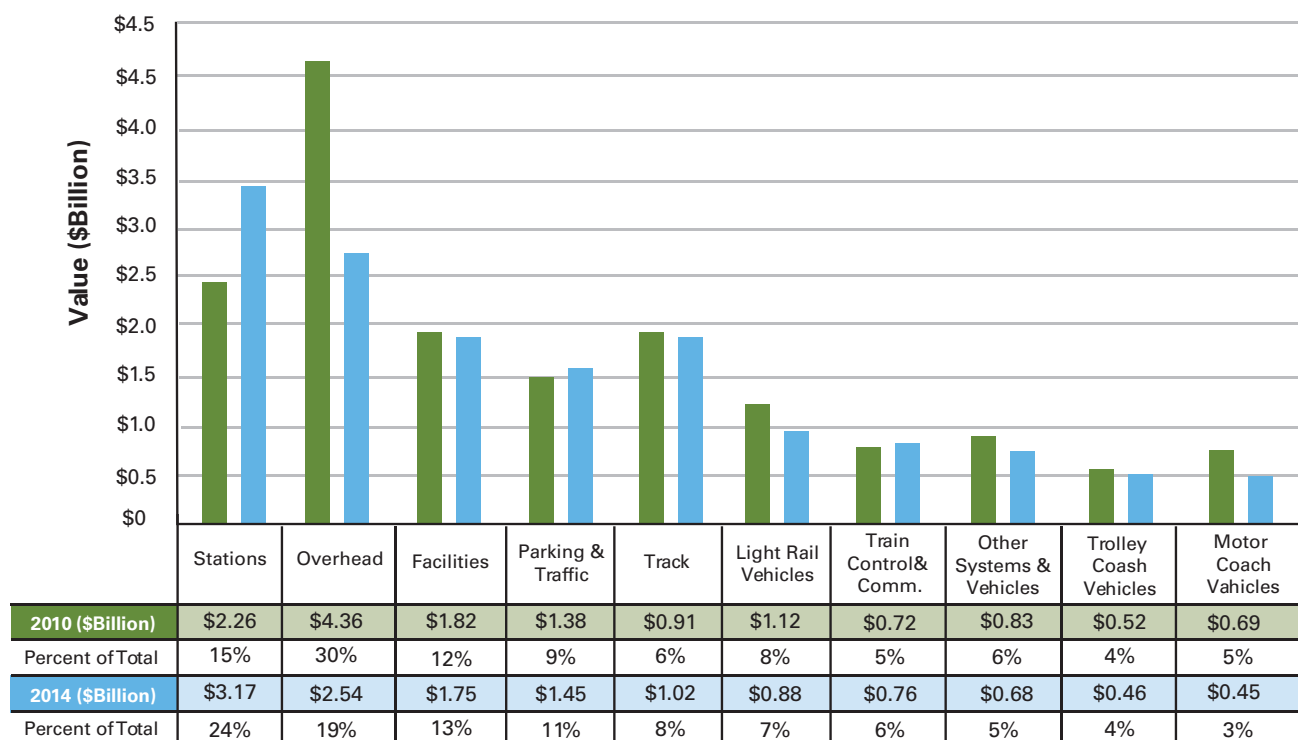


Figure 3: Total Asset Replacement Value by Asset Class, 2010 and 2014 Comparison

Estimated Backlog

To date, the SFMTA has not had the financial means to fully replace all assets before they reach the end of their scheduled useful life. 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 life. It is important to note that the 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 \$2.39 billion in 2010 and increased to \$2.45 billion in 2014. 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 the inventory updates made between 2010 and 2014. Therefore, comparing these two numbers directly is difficult. One can also note that the Transit Service Critical asset backlog has actually decreased by 18% between the two years. That reduction, however, is largely driven by the increased asset replacement value associated with stations (Other SGR) and decreased asset replacement value calculation for Overhead (TSC), shifting proportions between the two categories. Moving forward, as our inventory calculations become more refined and consistent, year-over-year changes to the backlog can serve as a key performance metric for measuring SGR.

Figure 4 presents a side by side comparison of the 2010 and 2014 estimated backlogs.

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

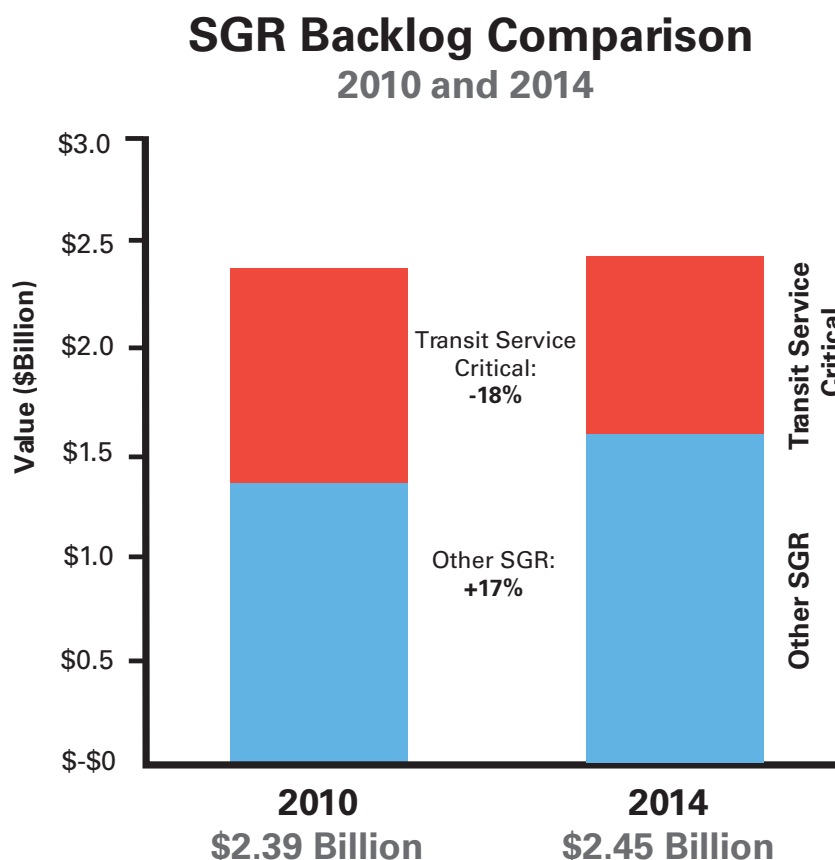


Figure 4: SGR Backlog, 2010 and 2014

SGR Backlog by Asset Class

Analyzing the backlog by Asset Class provides a more detailed look at which assets may be a higher priority and require increased investment in future years. This breakdown reflects the agency’s current prioritization of investments in Transit Service Critical assets, as TSC Assets have \$849 million in unmet need, compared to \$1,590 million for Other SGR assets.

Viewing the backlog by Asset Class is important for contextualizing the asset condition scores that are given on pages 18-19 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, the backlog presents an un-weighted metric for which assets may require the highest dollar amount of investment.

It is important to note that some assets received low TERM Lite scores, suggesting a high investment need, and yet still make up a relatively small portion of the backlog due to their low replacement cost. For example, Trolley Coach Vehicles have the lowest age-based condition score of any asset, as this report does not take into account a major trolley coach replacement project that is currently underway. However, Trolley Coach Vehicles make up a small portion of the current backlog due to their low replacement cost (see the graph of Total Asset Replacement Value on page 15 for details).

Parking & Traffic (\$579M), Stations (\$542M), and Facilities (\$381M) are the three largest categories of the backlog. All three Asset Classes are categorized as Other SGR. As is explained in more detail on page 19, Facilities and Stations both have a relatively good age-based condition score, despite their large investment need. Parking & Traffic received the second-lowest age-based condition score of all Asset Class categories. However, all three categories score above the FTA’s minimum threshold of 2.5 on a scale of 1 (poor) to 5 (new).

SGR Backlog by Asset Class \$2.45 Billion Total Need

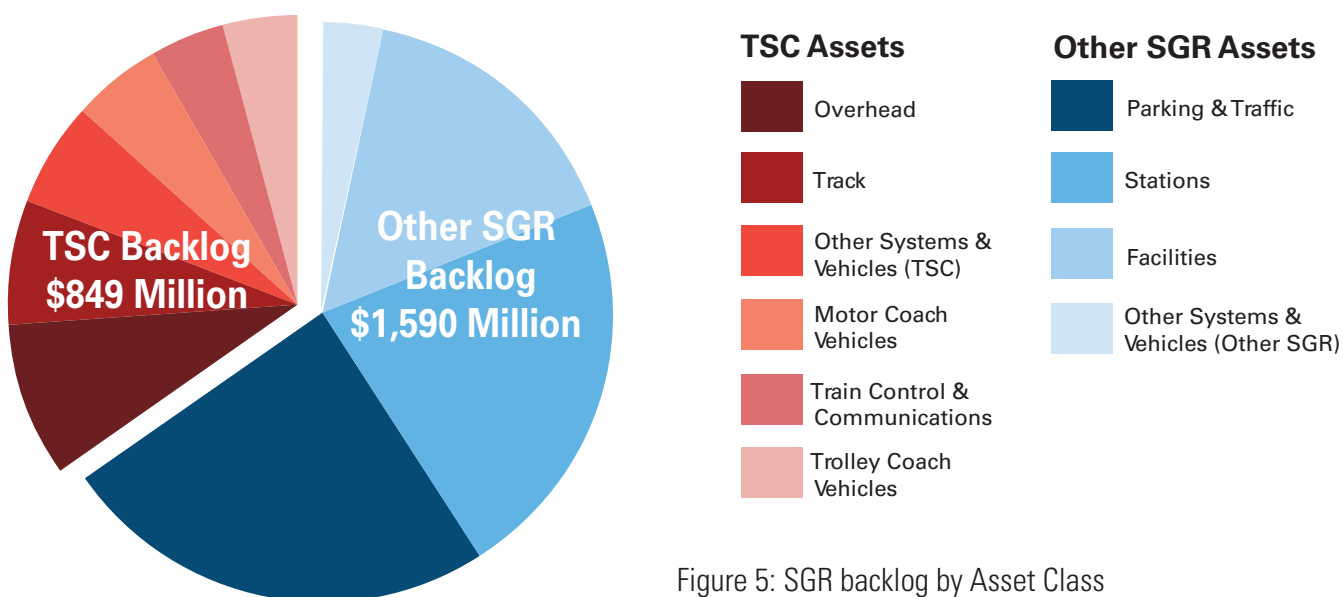


Figure 5: SGR backlog by Asset Class

Asset Condition Scores

In addition to calculating the current and future investment needs of the agency’s assets, the 2014 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.

Figure 6 shows the Average Condition Score (ACS) for all SFMTA assets, broken down by Transit Service Critical (TSC) and Other SGR classifications. The SFMTA is currently maintaining an ACS of 3.24 for all assets, surpassing the FTA’s recommended minimum threshold of 2.5. Transit Service Critical assets have an ACS of 3.32 and Other SGR assets have an ACS of 3.13, reflecting the agency’s higher level of investment in TSC assets.

Age-Based Condition Score - Overview

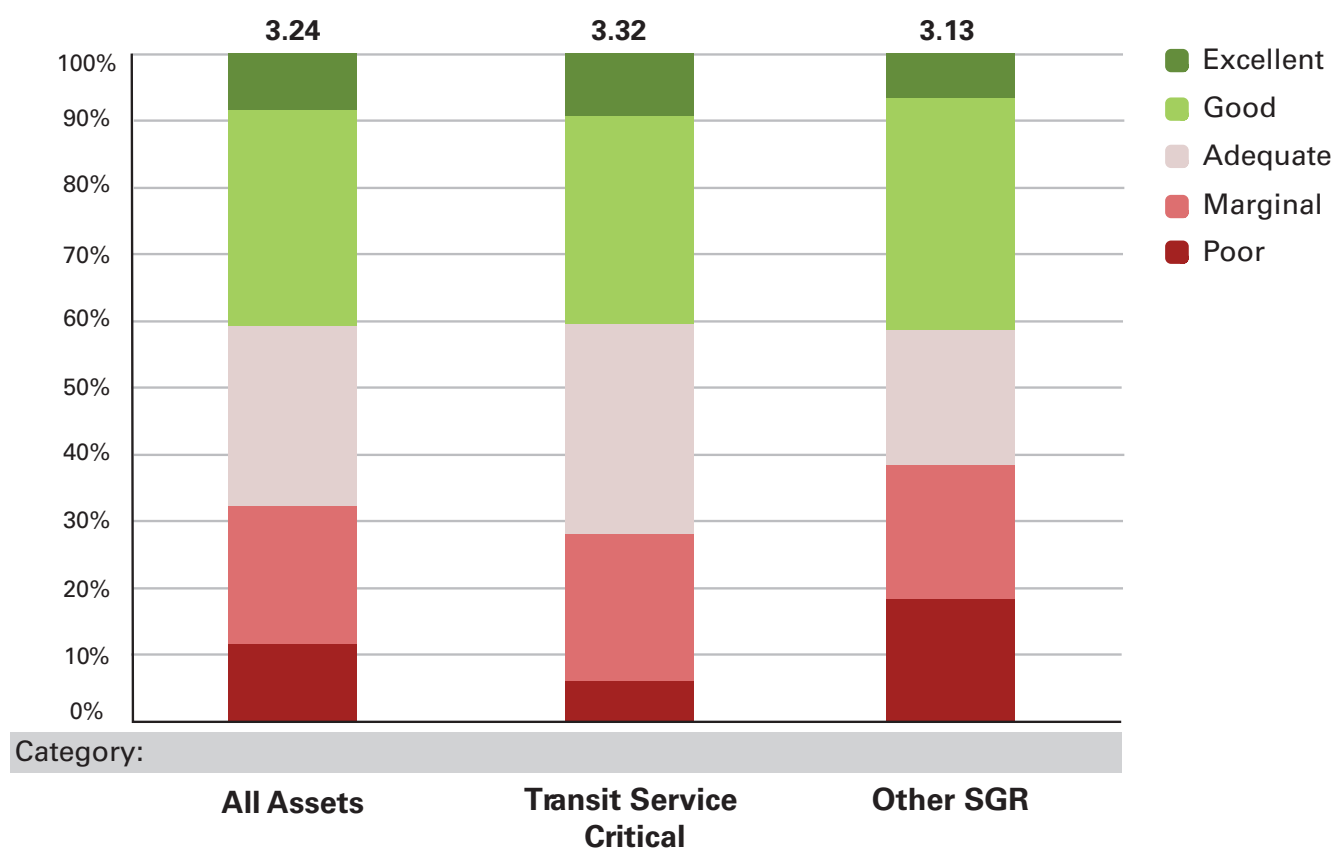


Figure 6: Age-Based Condition Score - Overview
(condition score based on scheduled useful life)

Figure 7 looks at the Average Condition Score (ACS) by Asset Class. In this view, Trolley Coach Vehicles stand out as the only asset class falling below an average score of 2.5. A project to replace 60 vehicles in the Trolley Coach fleet is currently underway; a contract was issued in early 2014 and the vehicles are expected to start arriving early 2015. The ACS for Trolley Coach Vehicles is therefore expected to increase significantly by the next SGR report.

Age-Based Condition Score by Asset Class

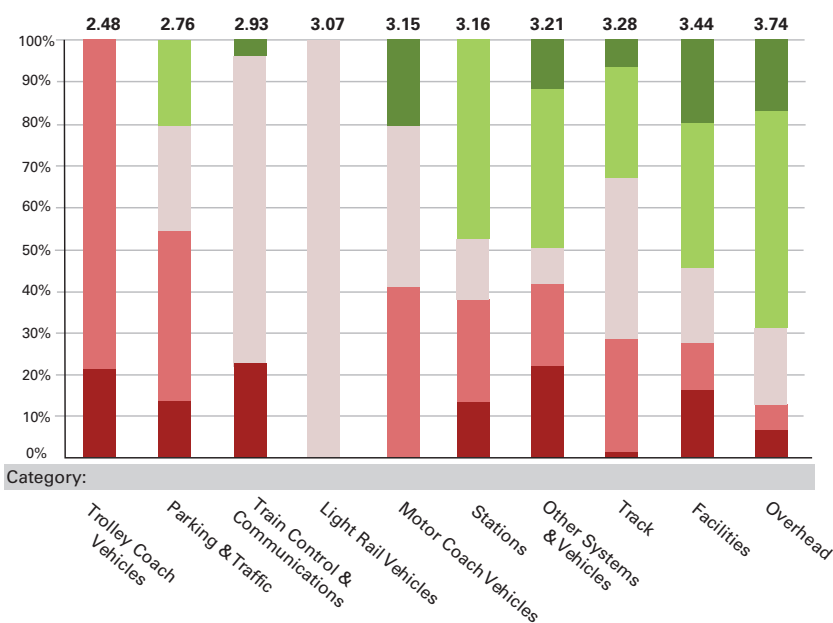


Figure 7: Age-Based Condition Score by Asset Class (condition score based on scheduled useful life)

Review of the data by Capital Program highlights Parking and Other Systems and Vehicles as programs with an ACS below 2.5. With regards to Parking, this program’s inventory has not yet been updated to reflect recently completed projects: a major parking meter replacement project has been completed since 2010, and several parking garages are also currently under renovation. The asset inventory has not yet been updated to include these parking investments. 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.

Age-Based Condition Score by Capital Program

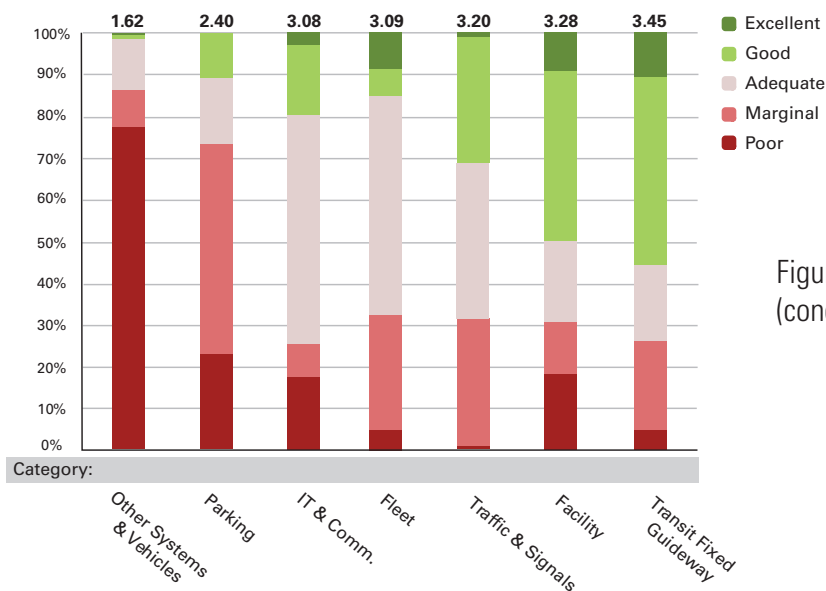


Figure 8: Age-Based Condition Score by Capital Program (condition score based on scheduled useful life)

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 billion in upcoming need. Addressing all upcoming investment needs as well as the current backlog of \$2.45 billion would amount to \$11.45 billion over the next 20 years.

Figure 9 shows the agency’s projected SGR needs by-year through 2034. As was mentioned previously, TERM Lite modeling does not support multi-year project cash flow assumptions; instead, replacement costs appear in full during the final year of an asset’s scheduled useful life. The high investment need for 2015 and 2034 are due to several high-dollar assets with a 20-year scheduled useful life needing replacement. Part III of this report gives details on how the SFMTA plans to address these needs in future years.

Unconstrained 20-Year Fiscal Need \$9 Billion Upcoming Investment Need (\$11.45 billion including backlog)

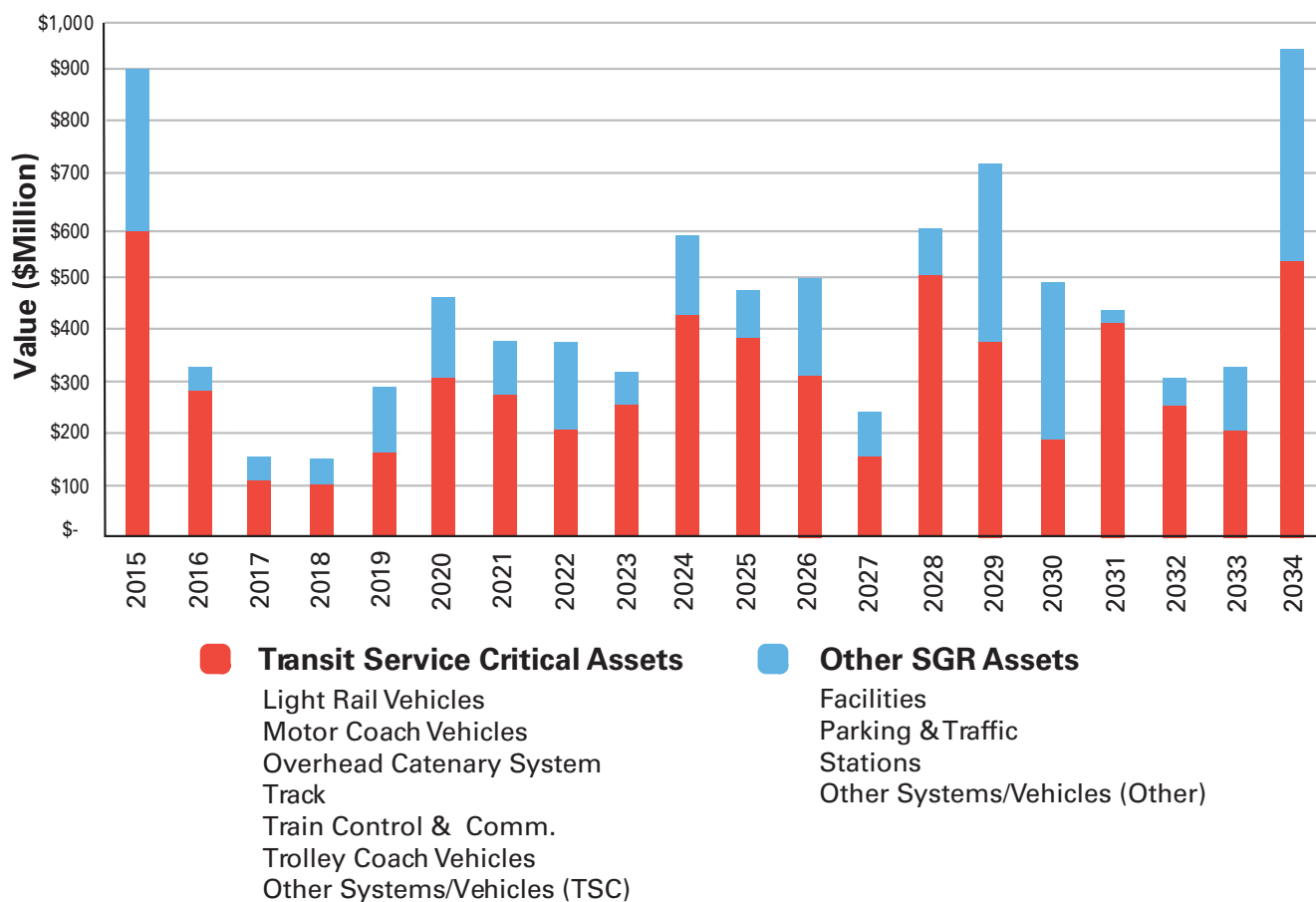


Figure 9: Unconstrained 20-Year Fiscal Need for SGR

SGR Investment Scenarios

Based on the \$11.45 billion needed in SGR investments over the next 20 years, the SFMTA would need to invest approximately \$570 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 billion in SGR needs that will arise over the next twenty years (\$450 million annually). These needs can be further divided into \$6.1 billion needed for Transit Service Critical Assets (\$305 million annually) and \$2.9 billion needed for Other SGR assets (\$145 million annually).

Figure 10 presents different SGR annual investment levels and their impact on the backlog and upcoming SGR needs. As was mentioned previously, 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.

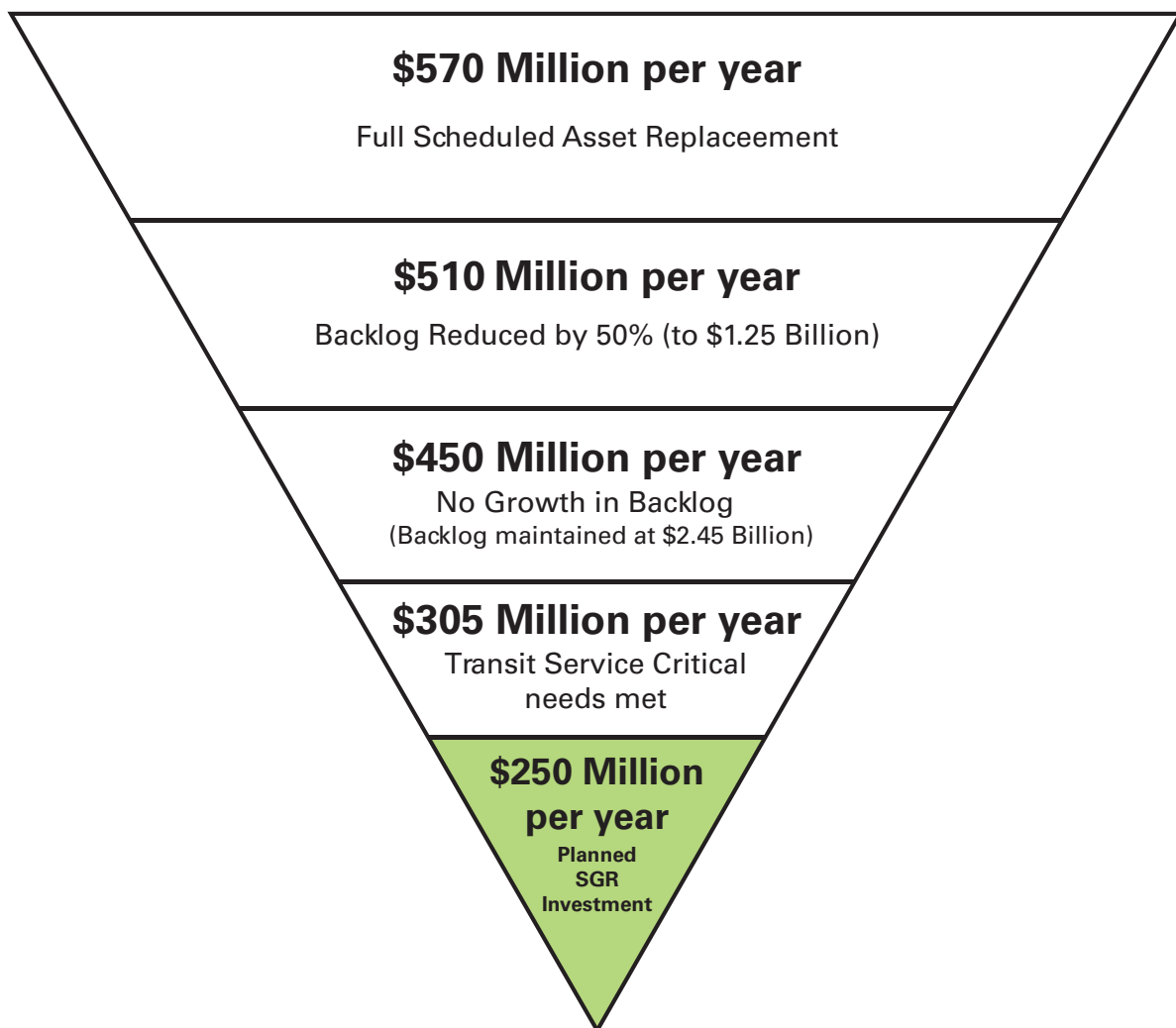


Figure 10: SGR Goals and Associated Required Investment Level

3.0 State of Good Repair Investments

Five-Year Outlook: The Fiscal Year 2015 – 2019 CIP

One Year Outlook

Investment Dashboard



Five Year Outlook

In May 2014, the SFMTA Board approved the FY 2015-2019 Capital Improvement Program (CIP), which increases State of Good Repair spending to an average of \$316 million annually. 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.

What is the CIP?

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 FY 2015-2019 CIP includes 370 projects for a total investment of \$3.30 billion, including infrastructure investments, capital procurements, area plans, and one-time initiatives such as educational programs. The CIP is updated every two years concurrently with the SFMTA Operating Budget.



Adopted on May 20, 2014



The CIP represents planned investments based on anticipated revenue projections from federal, state, and local sources. A portion of the SGR investments planned for the next 5-year CIP period are reliant on currently non-committed sources including competitive grants and ballot initiatives (for example, a potential increase to the vehicle license fee that is expected to be on the ballot in 2016). 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.

SGR Investment Comparison

The agency has invested an average of \$180 million over the past five years, including funds that are currently encumbered in contracts (note that encumbered funds are not included in the agency’s calculation of SGR investments for the next five year period). The agency’s average investment without encumbrances is \$141 million annually. Figure 11 shows SGR expenditures by year since 2010.

SGR Annual Investment (\$M) FY 2010-2014

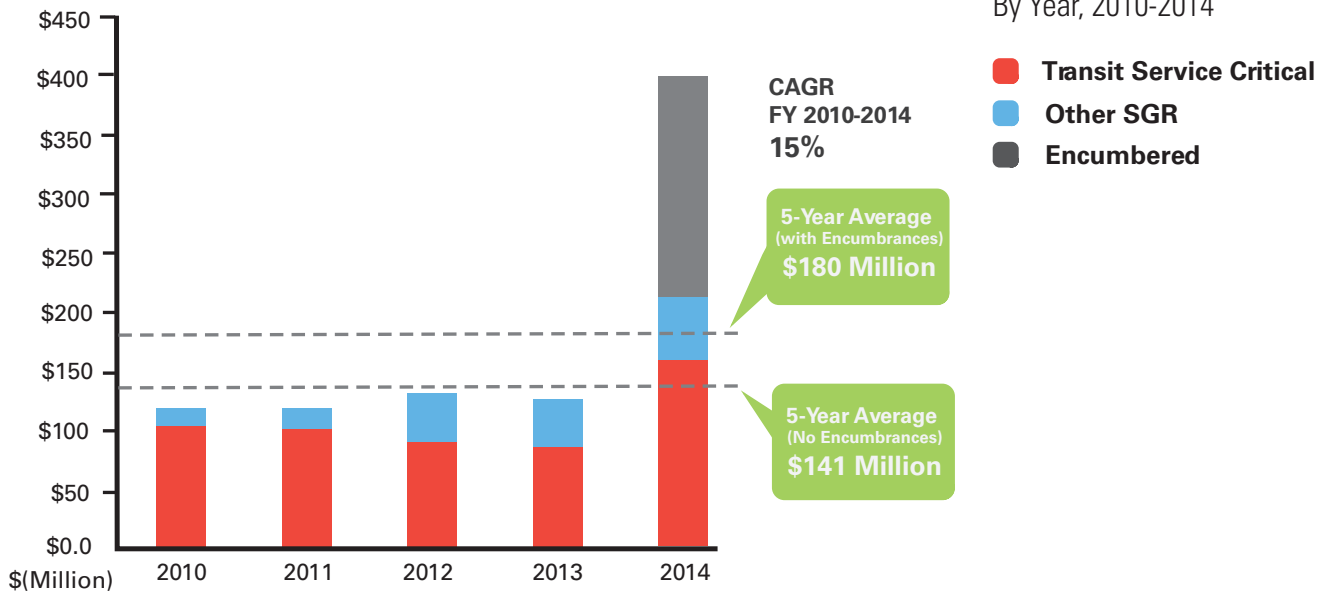


Figure 11: Annual SGR Investment By Year, 2010-2014

The SFMTA’s planned investment of \$316 million annually over the next five years, combined with \$180 million average annual investment over the last five years, will bring the agency’s total average annual investment in line with the \$250 million per year commitment that the SFMTA has committed to delivering.

Figure 12 shows the growth in SGR investment between FY 2010-2014 and FY 2015-2019, with an average investment over the ten-year period of \$247 million.

SGR Investment Comparison (\$M)

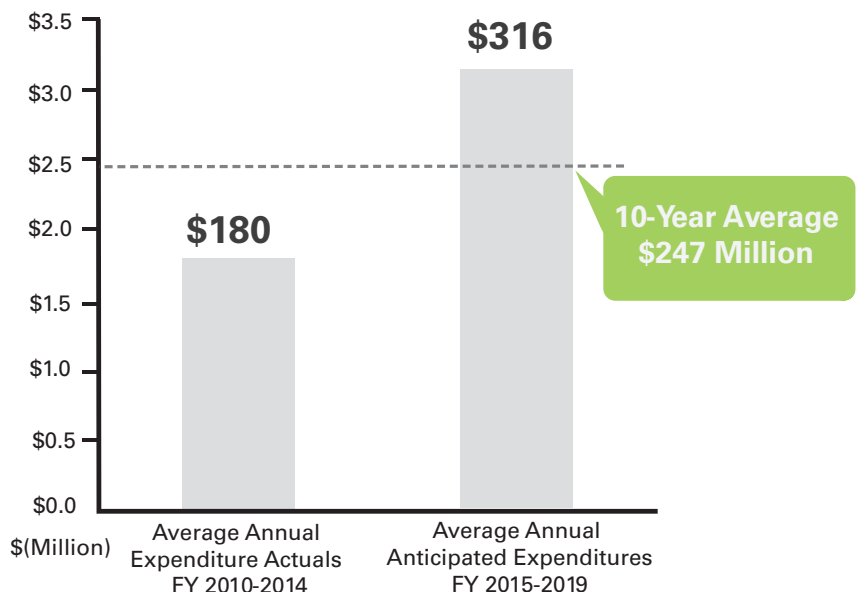


Figure 12: SGR Investment Comparison, FY 2010-2014 & FY 2015-2019

Given the level of funding outlined in the FY 2015-2019 CIP, the growth of the backlog will slow significantly. At the agency’s previous funding level of \$180 million annually, the backlog would have grown 103% over the next 20 years, or to more than twice its current value. At the committed funding level of \$250 million annually, the backlog is expected to grow by 61%. If the agency is able to continue to invest at \$316 million annually, the backlog will grow by 17% over the next 20 years.

Due to the cyclical nature of SGR investment needs, with some years requiring a much higher SGR investment than other years, it is important to view each CIP in the context of a 20 year horizon. The increased level of SGR investment over the next 5 years is driven by increased funding and project delivery capacity, combined with a higher SGR investment need due to major assets reaching the end of their useful life. As mentioned previously, the entire rubber tire fleet is scheduled to be replaced during this time, which represents a significant dollar amount of investment. The agency will also begin replacing all of its 151 light rail vehicles over the next five years (this is captured by the 71% increase in the Fleet program shown in Figure 13, below). Because fleet replacement occurs over multi-year procurements, we can expect annual SGR expenditures to remain high over the next five-year period. However, the agency may see sets of years with a lower investment level once these high dollar value fleet replacements are completed.

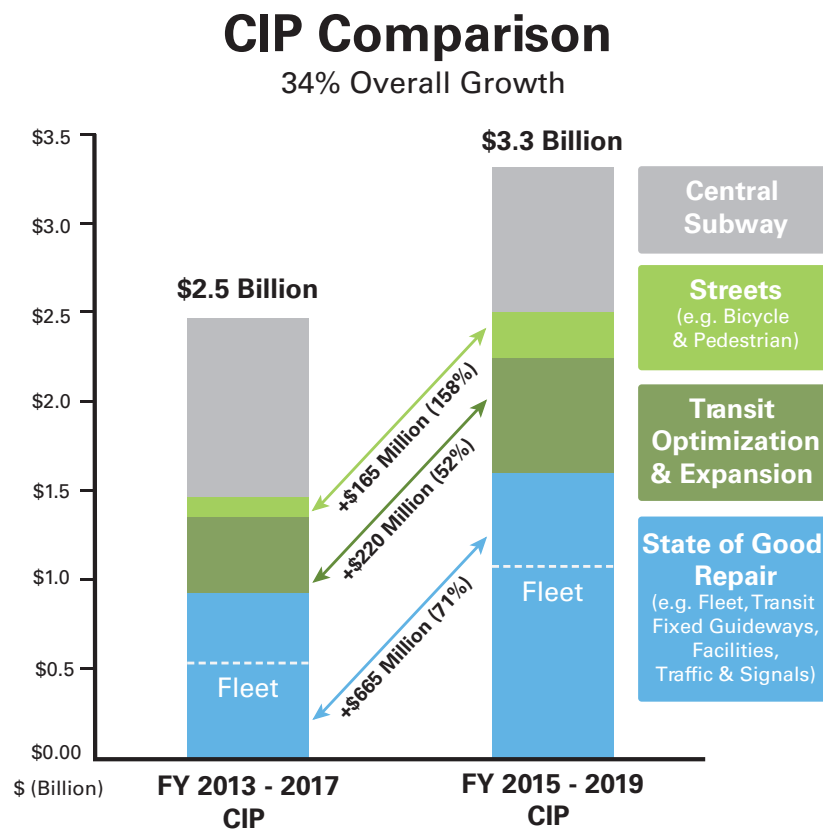


Figure 13: Comparison of FY 2013-2017 CIP & FY 2015-2019 CIP

Key SGR Investments: FY 2015-2019 CIP

The next five years will see major SGR investments across the transportation system, including:

- Transit vehicle rehabilitation and replacement, such as trolley coach replacement, replacement of the entire Muni Metro rubber tire fleet, and mid-life vehicle overhauls
- Replacement of old communications systems with state-of-the-art equipment, such as new Blue Light Phone systems in the Muni Metro Sunset and Twin Peaks Tunnels and modern radio and data communications systems for both revenue and non-revenue fleets
- Rail rehabilitation and replacement in the subways
- Signal repair and replacement at key locations throughout the city, including new pedestrian signals
- Maintenance facility upgrades such as new Life and Fire Safety Systems



One-Year Outlook

The agency is currently working to develop a “dashboard,” as laid out in the exhibit below (page 27), to track performance with regards to the goals outlined in this report. In addition to the annual SGR report, these dashboards will provide a tool for measuring the progress of SGR investments included in the 5-Year CIP. This dashboard will be presented to the FTA at each quarterly meeting. The presentation will review data from the previous quarter so as to allow for time to ensure the data are accurately represented. Because the CIP is a dynamic document, this section will serve as a way to track the agency’s annual SGR investments against the planned investments outlined in the CIP.

FY 2015 Investment Dashboard

Yearly SGR Investment Progress Tracker



DRAFT

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:

Resource and Staffing Analysis

The SFMTA is currently conducting a resource analysis to determine staffing needs in anticipation of the \$500 million General Obligation Bond, approved on the November 4, 2014 ballot.

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

Enterprise Asset Management System

The Enterprise Asset Management System (EAMS) 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 intends to enlist an implementation consultant, complete background discovery work to inform how the system will be configured, and complete the majority of the implementation with the Maintenance-of-Way Division. In subsequent years, the agency will also deploy the system in the Sustainable Streets (parking, traffic, bicycle, and pedestrian assets) and Transit Operations (fleet) divisions.



Appendices

Appendix A: Specific Inventory and Backlog Updates

2011 Updates: Refined cost estimates and asset additions

Specific updates included the following:

- Facilities: reduced total asset value of two major facilities
- Maintenance facilities: Various line item refinements
- Vehicles: Merged overhaul plans and costs into fleet line items
- Overhead Catenary System: Updated asset value estimation
- Overhead Catenary System: Added line items for OCS guideway elements
- Fixed Guideway: Added tunnels
- Stations: Updated asset value estimation
- Stations: Added LRV boarding islands on street
- Stations: Added elevators and escalators to inventory
- Track: Various line item refinements and updated quantity estimates

2014 Updates: Reflection of completed projects

A summary of the projects included is as follows:

- Phelan Bus Loop Relocation
- Automatic Fare Collection System
- MMT Rail Rehabilitation
- Carl & Cole Rail Replacement
- MMT Water Intrusion Mitigation
- Church & Duboce Rail Replacement
- Islais Creek Facility - Phase I
- Escalator Replacement - Phase I
- St Francis Circle
- Green Roof Replacement
- Bernal Substation
- Purchase of new motor coaches
- Rehabilitation and retirement of motor coaches
- Significant new items in the backlog (2010 – 2014)
- Stations: Most equipment at Forest Hill Station
- Facilities: Fire detection equipment at most substations
- Facilities: Various other equipment at some substations

Appendix B:

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 C:

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
Total	\$839.6	\$870.3	\$684.7	\$479.9	\$440.0	\$3,314.5

Appendix D:

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
Total	\$3,314.6	\$1,805.1	

Appendix E:

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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