2021 State of Good Repair Report

San Francisco Municipal Transportation Agency

SFMTA

Table of Contents

List of Figures 2
Executive Summary 3
I. Introduction 4
SFMTA Overview 5
State of Good Repair Policies 7
10-Year Asset Management Strategy 8
Asset Management Model 10
SFMTA TAM Plan Elements and Implementation Progress 13
Capital Planning Process 15
II. State of Good Repair 16
State of Good Repair Defined 17
Capital Asset Inventory 18
Categorizing Assets 19
2021 Capital Asset Inventory Update 20
TERM Lite Modeling Tool 20
III. 2021 State of Good Repair Analysis 22
Asset Replacement Value 23
Reported Asset Backlog 24
Asset Condition Scores 26
State of Good Repair Investments 39
Long-Term Investment Needs 41
IV. Conclusions and Next Steps 43
Conclusion 44
Next Steps 45

List of Figures

Figure 1: 10-Year Asset Management Strategy 8

Figure 2: A Complete Asset Management Model 10

Figure 3: Asset Management Maturity Scale 11

Figure 4: Transportation Asset Management Plan Progress 13

Figure 5: State of Good Repair Categorization 19

Figure 6: Total Replacement Value by Asset Class 23

Figure 7: Reported Asset Backlog 24

Figure 8: Reported Asset Backlog by Asset Class 25

Figure 9: Transit Service Critical vs. Other State of Good Repair Condition Scores 26

Figure 10: Age-Based Condition Score by Capital Program 27

Figure 11: Age-Based Condition Score by Asset Class 27

Figure 12: Asset Class Condition Scores from 2015-2021 28

Figure 13: State of Good Repair Investments (FY10-21 Actuals; FY22-25 Planned) 40

Figure 14: State of Good Repair Required Investment Levels (0% Escalation) 41

Figure 15: Upcoming 20 Year Investment Need 42

Executive Summary

The San Francisco Municipal Transportation Agency's (SFMTA) 2021 State of Good Repair Report provides an overview of the SFMTA's rehabilitation and replacement needs and investments. It also outlines the SFMTA's project prioritization, planning, and delivery practices related to maintaining a State of Good Repair and institutionalizing the practice of asset management.

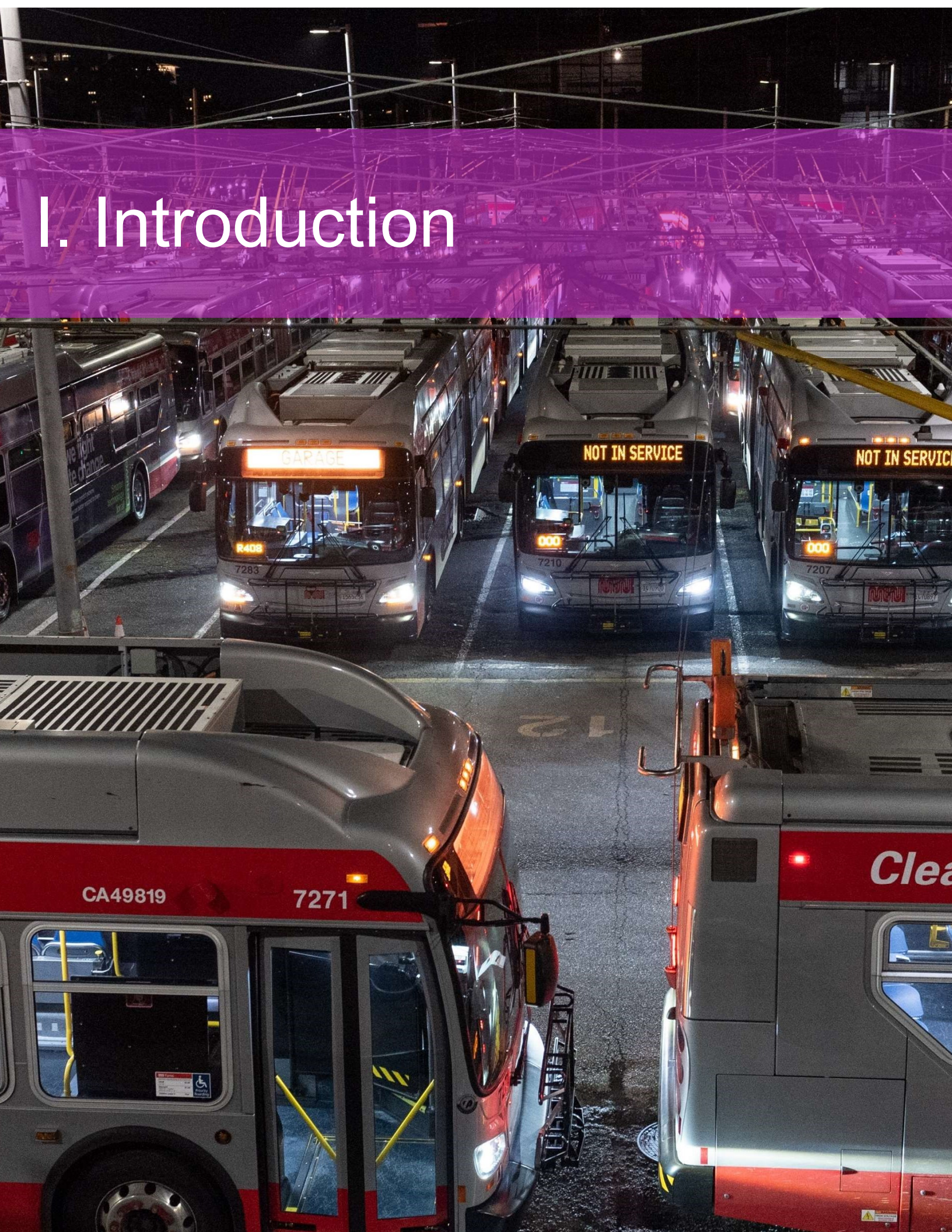
This is the ninth comprehensive annual State of Good Repair Report published by the SFMTA. The SFMTA is committed to issuing this Report annually as a best practice shared by transit agencies across the region, country, and world. The Report aims to track the progress of State of Good Repair investments and asset management practices and compare directly to previous reporting periods. This document builds on previous State of Good Repair Reports and contains financial data and condition scores from FY2020-2021 as well as previous years.

Achieving a State of Good Repair requires an understanding of the desired performance of an asset and timely investment to maximize that performance over its useful life. The SFMTA owns and maintains an estimated $16 billion of capital assets in FY2020-21 including motor coaches, trolley buses, light rail vehicles, historic streetcars, cable cars, maintenance and administrative facilities, parking garages, active transportation infrastructure, and street signs and paint. With an annual budget of approximately $1.4 billion, the SFMTA must balance the needs of the transportation system between expanding capacity and reinvesting in existing infrastructure. The SFMTA has committed to investing an average of $250 million annually in State of Good Repair. This is a commitment made to the Federal Transit Agency (FTA) in 2010. In FY2020-21, the SFMTA spent $164 million on State of Good Repair investments that maintain or renew the SFMTA's assets. This brought the SFMTA's annual average investment since FY 2010 to $228 million per year. This average has consistently risen towards the SFMTA's $250 million minimum goal and commitment to the FTA.

This report also provides data on the condition of the SFMTA's capital assets based on FTA condition standards. The FTA's Transit Economic Requirements Model Lite ("TERM Lite") calculates a condition score on a scale of 1 (poor) to 5 (excellent). For FY2020-21, 3.01 was the value weighted condition score for all SFMTA assets. A score of at least 2.5 is required for the FTA to recognize a transportation system as being in a State of Good Repair. This score represents a decline of 0.06 from the reported value of 3.07 in the 2020 State of Good Repair Report. The model calculated these scores based only on the age of the assets reported, excluding other factors such as specific operating conditions and level of use that impact asset condition. The SFMTA is currently working on a condition assessment program across all asset classes. As this data is collected, condition scores will be included in the SFMTA's asset condition model to reflect the true condition of the assets more accurately.

Previous State of Good Repair reports have highlighted the need for the SFMTA to increase state of good repair investment, to prioritize investment in existing infrastructure, and to improve condition assessment activities and information sharing. Since the last Sate of Good Repair report was published, the SFMTA has taken additional major steps to address our system's urgent needs by continuing condition assessments for major asset classes, investing in PSD Citywide as the SFMTA's new asset management system, and continuing a multitude of transit-critical investment projects. The SFMTA is aware that work still needs to be done to reach full asset management maturity and must continue to build asset management capacity while maintaining assets that are essential to delivering the services the public expects of the SFMTA.

I. Introduction



SFMTA Overview

We operate today's transportation system and work with our partners to plan the transportation system of tomorrow.

Who We Are

San Francisco voters established the San Francisco Municipal Railway (Muni) in 1912, creating the nation's first publicly owned transit system. In 1999, voters created the San Francisco Municipal Transportation Agency (SFMTA) by passing Proposition E, which merged Muni with the Department of Parking and Traffic to form an integrated SFMTA 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 department of the City and County of San Francisco, the SFMTA currently manages all ground transportation in the city.

A Board of Directors governs the SFMTA, providing policy oversight and ensuring the public interest is represented. The Board's duties include approving the SFMTA'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 SFMTA plans, designs, builds, operates, regulates and maintains one of the most comprehensive transportation networks in the world. Directly managing five types of public transit in San Francisco (motor coach, trolley coach, light rail, historic streetcar and cable car), the SFMTA keeps people moving with Muni, the nation's eighth largest public transit system. The SFMTA also manages on- and off-street public parking, facilitates bicycling and walking, regulates taxis, and manages paratransit services for those unable to use fixed-route services.

Guided by its Strategic Plan, the SFMTA strives to deliver on priorities defined by goals centered around Safety, Travel Choices, Livability, and Service. The city's streets are made safer as the SFMTA implements a Vision Zero initiative that includes quickly building critical safety improvements to eliminate traffic deaths. The SFMTA moves "Muni Forward" with new trains and buses and improvements to its Transportation Management Center to ensure consistent delivery during its scheduled service hours. The SFMTA's Bike Program is considered one of the best in the world; and advancing electric vehicle use, ongoing conservation efforts, and implementation of sustainable transportation and land use polices help improve the quality of life and environment in San Francisco. The SFMTA provides an outstanding workplace for staff who in turn strive to provide outstanding service to the community.

Vision

Excellent transportation choices for San Francisco

Mission

We connect San Francisco through a safe, equitable, and sustainable transportation system

Asset Management Unit

The SFMTA's Transportation Asset Management Unit advances efforts to continuously improve the way the SFMTA procures, operates, maintains, rehabilitates, and replaces transportation assets, including fleet and infrastructure, to create a culture of data-driven decision-making and analysis that is timely, accurate, and actionable.

The Asset Management Unit manages the program to define, build and lead the support, policies, processes, documentation, and tools to optimize the performance and cost effectiveness of San Francisco's transportation infrastructure. This team prepares required plans and documents including the Transit Asset Management Plan (TAM), City and County of San Francisco 10-Year Capital Plan, SFMTA State of Good Repair Report.

The team also supports the development of the SFMTA 20-Year Capital Plan, oversees the development and administration of the SFMTA's capital asset inventory, manages the implementation of the SFMTA 10-Year Asset Management Strategy, leads the planning, design, and implementation of condition assessments in partnership with SFMTA divisions and sections, and analyzes the impacts of and makes recommendations for investments to improve the transportation system.

State of Good Repair Policies

The SFMTA has specific policies related to the State of Good Repair of the transportation system. These policies are integrated into the SFMTA's Capital Plan and Program Policies.

The SFMTA's documentation of State of Good Repair Policies is a key element in laying the foundation for a successful Asset Management Program. These policies were integrated into the SFMTA's Capital Plan and Program Policies in 2018, tying asset management into the SFMTA's capital planning process, the development of the 5-Year Capital Improvement Program and 2-Year Capital Budget.

State of Good Repair Policies:

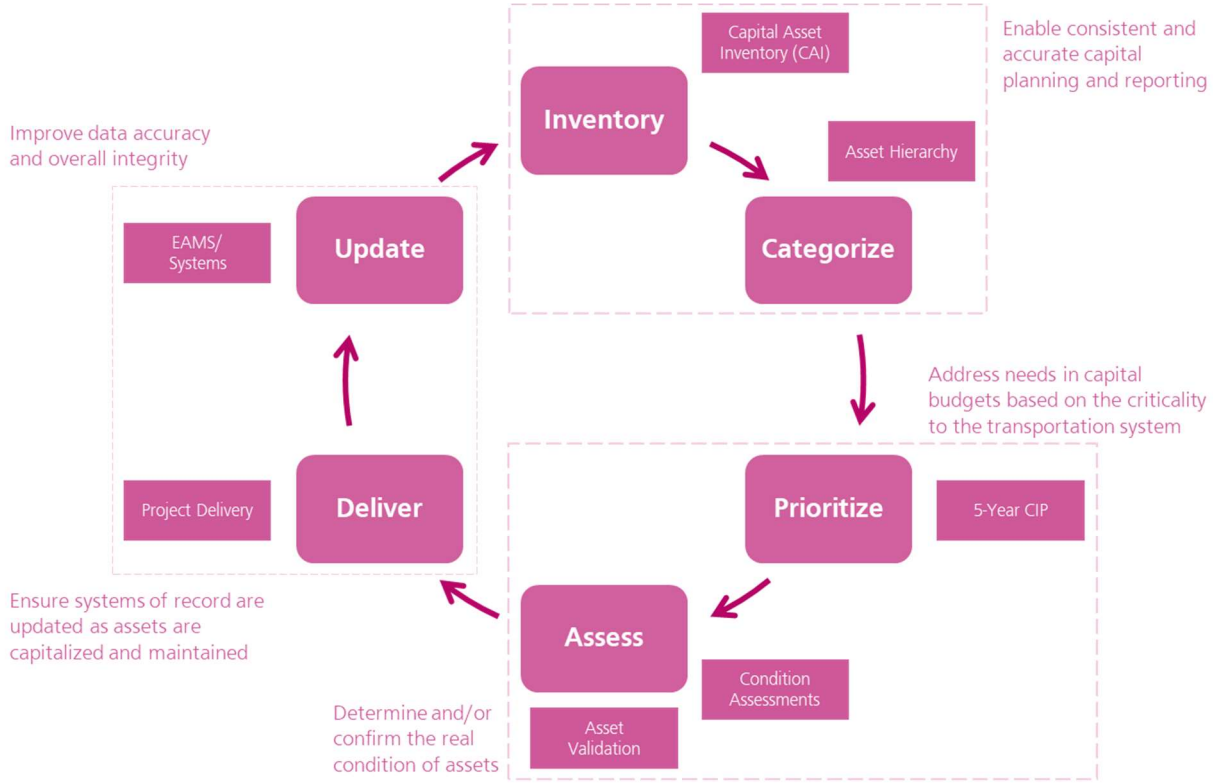
- State of Good Repair is when an asset's condition results in the operation of that asset at a full level of performance.
- The Asset Management Program sets the framework for asset condition standards and reporting methods that classify the level of performance of Asset Classes within the SFMTA's Asset Hierarchy.
- Each Asset Class will have defined metrics for evaluating State of Good Repair based on condition, safety, reliability, or other defined data metric.
- State of Good Repair metrics will be reviewed and approved by the Asset Management Steering Committee.
- Divisions, through their respective Subject Matter Experts, will regularly evaluate the State of Good Repair by identifying investment levels required in the appropriate Asset Classes in the Capital Improvement Program.
- The Asset Management Unit of the Finance and Information Technology Division shall prepare an annual State of Good Repair Report detailing capital investment impacts on SFMTA Asset Classes.

10-Year Asset Management Strategy

A complete performance model that includes asset life cycle management and capital planning for sustained success.

The 10-Year Asset Management Strategy (see Figure 1) is a blueprint and process that builds upon existing work that will result in lower costs, improved infrastructure management and greater efficiencies when fully implemented across the SFMTA. The goal is not just a collection of data and reporting, but actively using this data in the prioritization of investment choices and the development of capital projects.

FIGURE 1: 10-YEAR ASSET MANAGEMENT STRATEGY



Each of the elements of the cycle above is defined as follows:

- Inventory – The complete, detailed listing of the SFMTA's asset portfolio that incorporates age, useful life, value, maintenance activities, and other key elements to accurately track the status of each asset and the portfolio as a whole.
- Categorize – The manner in which the inventory is broken into distinct groups for the sake of sorting, management, and consistent reporting activities.
- Prioritize – Based on the state of elements in the inventory, the SFMTA will develop the order in which requirements and needs will be met.

- Assess – All elements of the inventory are both continuously and periodically assessed for their condition to determine the state of repair of each individual asset and the inventory as a whole; these are completed on a 1-5 scale (with 5 being the highest).
- Deliver – Based on the condition assessment and prioritization of the inventory, the SFMTA will perform various activities to improve the state of its assets; this will be accomplished via Capital Projects implementation, preventive maintenance, and/or as-needed repair.
- Update – Following the delivery of improvement activities, the details of each asset will be updated to reflect key elements, including age, new useful life, value, and other relevant information to accurately track and manage the asset.

In FY2020, the Asset Management Unit began the procurement process for a software to store and organize the Capital Asset Inventory, initiated the signals and stations condition assessment projects, and incorporated asset information into key decision points in the budget development process.

The SFMTA continued these efforts in FY2021 through leveraging PSD Citywide as the SFMTA's new asset management software. PSD Citywide will be the new home of the Capital Asset Inventory and will serve as a centralized hub for maintaining an accurate inventory with real-time asset additions, edits, and reporting functionality. PSD Citywide will also provide the functionality to segment out the inventory in different ways to serve all reporting needs and offer new insights on asset classes. The SFMTA also has continued asset condition assessment projects and plans to incorporate those condition scores into a State of Good Repair score that can go beyond solely age-based condition scores.

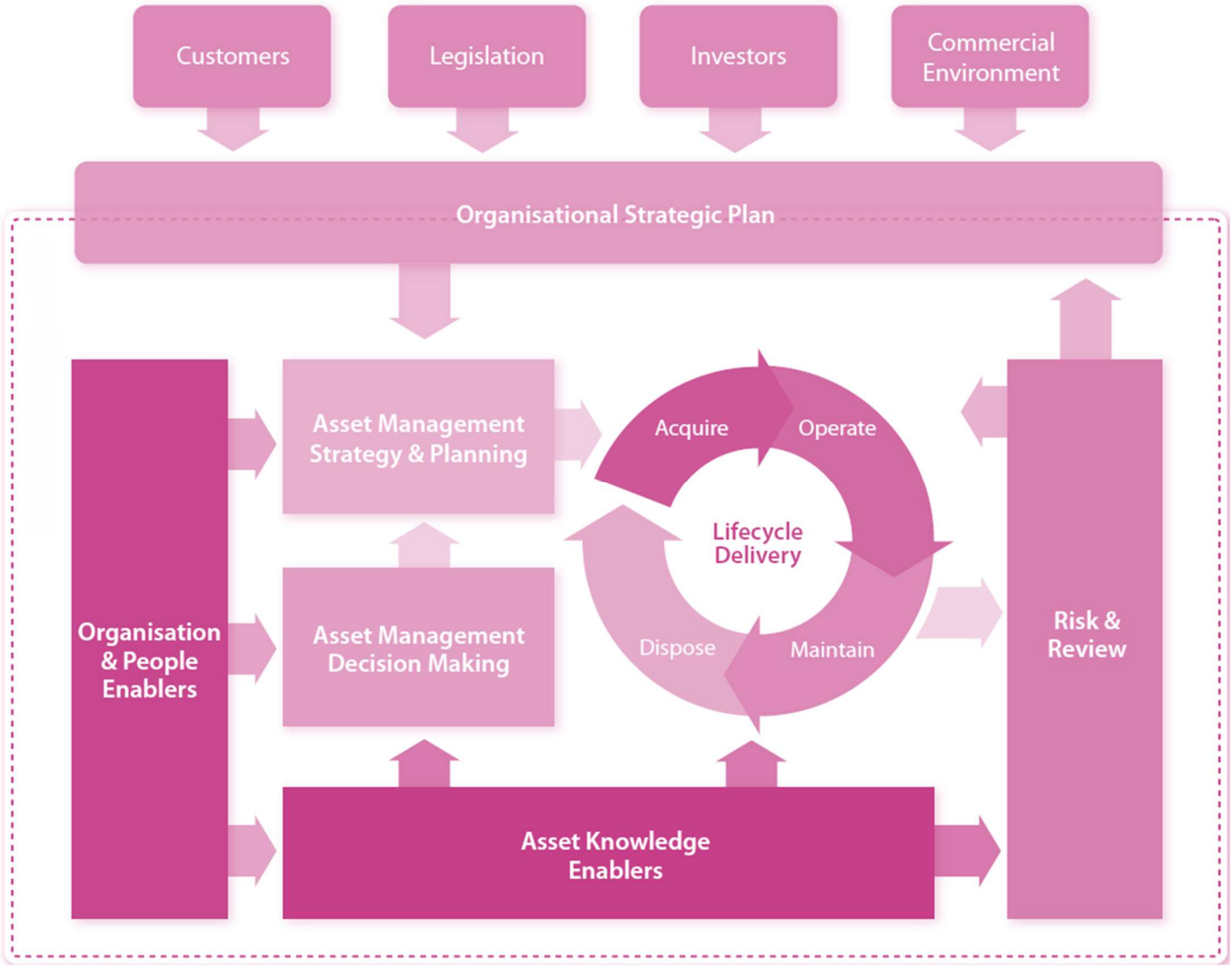
The 10-Year Asset Management Strategy follows an annual cycle of continuous improvement that addresses processes, tools, and people related to Asset Management practice at SFMTA. The Asset Management Unit is dedicated to implementing the year-round strategy and aims to improve performance after each cycle.

Asset Management Model

Figure 2 represents the Institute of Asset Management's Conceptual Asset Management model. This model comprises a suite of six subject groups which represent processes, people, and tools that contribute to functional asset management practice within an organization.

The focus of the 10 – Year Strategy is in the center of this model, highlighting actions to align Strategy & Planning, Lifecycle Delivery, Asset Knowledge, and Asset Decision Making. It is the responsibility of the Asset Management Unit to work with stakeholders to enhance these subject groups to implement a robust asset management program at SFMTA.

FIGURE 2: A COMPLETE ASSET MANAGEMENT MODEL



Asset Management Maturity Scale

The advancement of the Strategy is measured by the SFMTA's Asset Management Maturity scale shown in Figure 3. The Asset Management Maturity level can be applied at difference scales across the SFMTA from the division down to the individual business unit and represents the level at which asset management practice is integrated into existing business processes. Asset management maturity advances at different rates depending on the state of existing processes, staff awareness, and capacities.

FIGURE 3: ASSET MANAGEMENT MATURITY SCALE

As the 10 Year Asset Management Strategy advances, the SFMTA moves up overall levels in the Asset Management Maturity model (see Figure 3). The goal is to reach level 5, a state of practice where asset information is so integrated into the organization's functions that it optimizes each asset to extract the most value over its entire lifecycle with minimal waste. Performance against the 10-Year Strategy can be measured by the maturity of asset management across the SFMTA.

Currently, the SFMTA is at a Level 3+ on the Asset Management Maturity scale. The SFMTA has a clearly defined Policy & Strategy, Level of Service Objectives, and a Business Plan. This strategy is highlighted prevalently both in the annual State of Good Repair reports and every four years in the SFMTA's Transit Asset Management Plan. The SFMTA also has an asset inventory and performs condition assessments.

There are a few critical actions the SFMTA can take to continue climbing the Asset Management scale. The SFMTA needs a regular cadence for condition assessments for all classes of assets. Additionally, these condition assessments need to be incorporated into each asset's score in the annual SGR report for a more holistic view of the health of each asset. The Asset Management Unit will conduct reviews of the SFMTA's asset management maturity and will continue to incorporate those results into future versions of the State of Good Repair report.

2018 Transit Asset Management Plan

TAM Plans must include at a minimum an asset inventory, condition assessments of inventoried assets, and a prioritized list of investments to improve the State of Good Repair of capital assets.

The 2018 Transit Asset Management Plan satisfies the FTA's requirement and serves as the implementation plan for the SFMTA's 10-Year Asset Management Strategy.

In July 2016, the Federal Transit Administration (FTA) published a Final Rule for Transit Asset Management. The Transit Asset Management Rule (49 CFR part 625) is a set of federal regulations that sets out minimum asset management practices for transit providers. The FTA's Rule for Transit Asset Management requires every transit provider that receives federal financial assistance under 49 U.S.C. Chapter 53 to develop a Transit Asset Management (TAM) Plan. According to the FTA, the TAM Plan is a tool that will aid transit providers in assessing the current condition of their capital assets, determining what the condition and performance of its assets should be, identifying the acceptable risks in continuing the use of an asset that is not in a State of Good Repair, and deciding how best to balance and prioritize funding to improve an asset's condition.

In October 2018, the SFMTA completed its inaugural TAM Plan, detailing the SFMTA's policy, approach, and implementation process to improve its asset management practices over the next four years. The 2018 SFMTA TAM Plan employed an action-oriented framework that aimed to improve the maturity of asset management at the SFMTA. The TAM Plan documents the SFMTA's asset management policy and presents the SFMTA's overall asset management improvement program. Additionally, the TAM Plan includes the ongoing governance and system of accountability for managing implementation of an asset management program. The 2018 TAM Plan includes an ambitious set of goals to advance the nine FTA required asset management elements. The SFMTA established the Asset Management Unit in January of 2019 to meet these goals within the 4-year TAM Plan period. The next update of the SFMTA's TAM Plan is currently in development and will be complete in 2022.

The TAM Plan's development process was designed to:

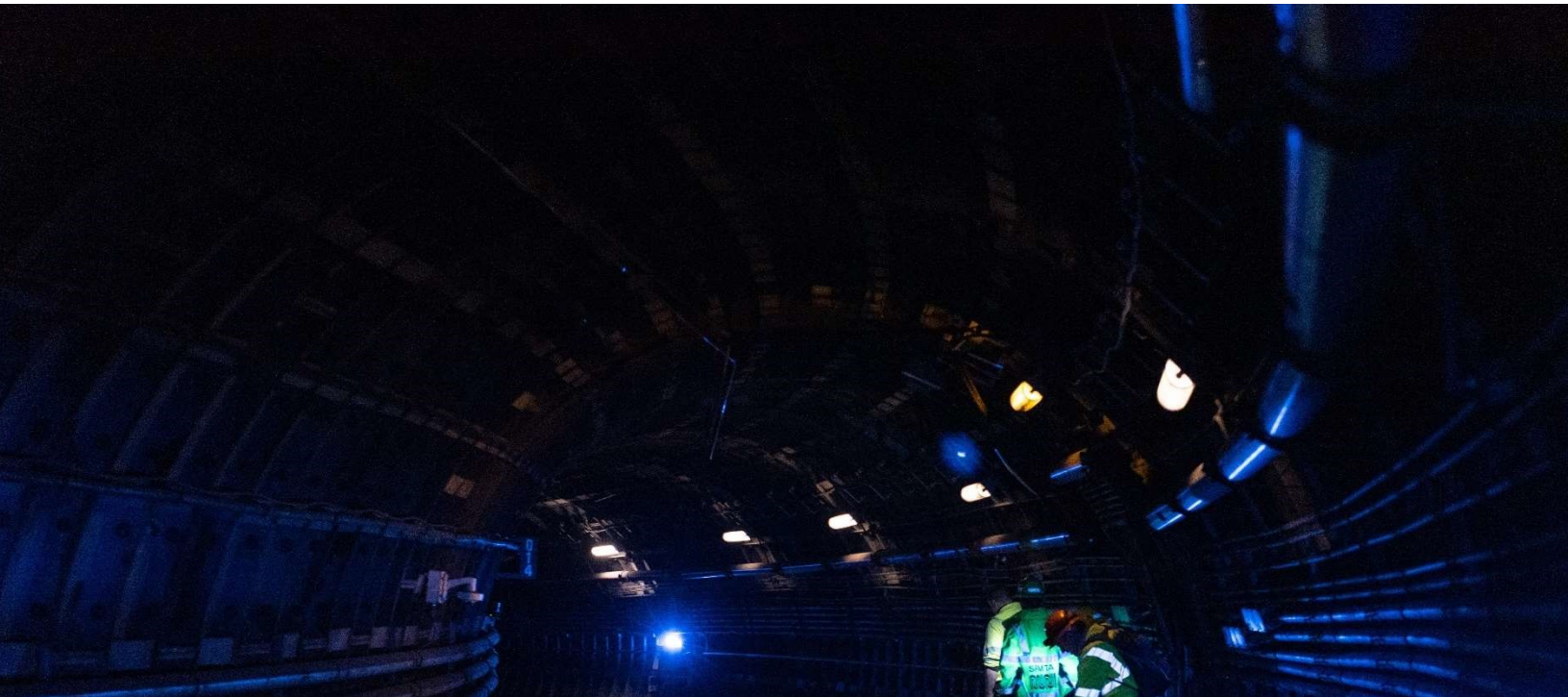
- Communicate the SFMTA's commitment to asset management practice.
- Facilitate the establishment of a culture that values and prioritizes asset management.
- Embed asset management responsibilities and accountabilities into strategic planning activities.
- Build on existing asset management strengths and best practices.
- Provide leadership and direction in establishing asset management into capital, operating and maintenance activities.

SFMTA TAM Plan Elements and Implementation Progress

FIGURE 4: TRANSPORTATION ASSET MANAGEMENT PLAN PROGRESS

TAM Element	SFMTA Approach	TAM Implementation Progress
Asset Inventory All capital assets a transit provider owns, operates, or manages	The SFMTA keeps an inventory of all its assets within a database	SFMTA Capital Asset Inventory is updated annually. In FY21, AMU staff began the process of shifting the Capital Asset Inventory to PSD Citywide to store and maintain the SFMTA's capital asset inventory.
Asset Condition Assessment Ratings of inventoried assets that generate information to monitor and predict the performance of assets and inform investment prioritization	The SFMTA uses TERM to determine the condition of its assets with an on-going program to update this data and further refine it.	AMU staff have continued the Asset Condition Assessment Program. AMU staff utilize a dashboard to map the state of inspections across key asset classes and types.
Analytical Process or Decision-Support Tool Tool used to analyze capital investment needs over time and develop investment prioritization	The SFMTA uses its Capital Plan, Capital Improvement Program, and Capital Budget process to determine capital investment needs over time.	Condition scores and asset class trends from the State of Good Repair Report are used by Capital Program managers to support resource requests and justify decisions related to capital project prioritization during the Capital Planning process.
Investment Prioritization Ranked list of a provider's programs and projects to improve or manage over the TAM plan horizon period in order of priority and anticipated year	The SFMTA has created a Capital Improvement Program that is a list of projects with a full funding plan prioritized from the Capital Plan.	SFMTA is committed to a minimum level of State of Good Repair investment which the Asset Management Unit monitors each budget cycle. Projects which support the SGR investment goal are prioritized during the Capital Improvement Program development process.
Transit Asset Management and State of Good Repair Policy Provider's goals and objectives in creating TAM Plan and SGR Report	The SFMTA has established Asset Management and State of Good Repair policies.	AMU staff will evaluate the Asset Management Program goals and objectives every four years during the Transportation Asset Management Plan update cycle.

TAM Element	SFMTA Approach	TAM Implementation Progress
Implementation Strategy Operation process designed to implement TAM plan	The SFMTA has created the Asset Management Unit to implement the TAM Plan and the 10-Year Asset Management Strategy.	AMU staff workplans are driven by the 15 Action Items outlined in the Asset Management Strategy and TAM Plan. Action Items are reviewed and updated as part of SFMTA's annual performance plan and evaluation process.
Key Activities Description of activities that a provider intends to engage in over the TAM plan horizon period	The SFMTA Asset Management Plan has mapped out a set of 15 phased action plans to advance asset management practice at the SFMTA.	The Asset Management Unit has made significant progress on Action Plans which will be further discussed in the 2022 TAM Plan.
Resources Summary or list or resources need to develop and carry out TAM plan	The Asset Management Unit has met and partnered with several other SFMTA business units to learn about and develop required asset management resources.	SFMTA's Asset Management Working Group is a monthly forum with participants across the organizational chart to set policy, discuss best practice, and advance asset management practice at the SFMTA.
Monitoring, Updating, and Evaluating Strategy A strategy that will outline how a provider will monitor, update, and evaluate its TAM plan to ensure continuous improvement	The SFMTA 10 Year Asset Management Strategy defines annual cycles related to monitoring, updating, and evaluating the actions to advance asset management, state of good repair activities, and the implementation of the TAM plan.	The AMU uses dashboards to track the status of the SFMTA's condition monitoring across primary asset types.



Capital Planning Process

Provides foundational structure for the SFMTA's capital investments involving replacement, renewal, improvement, expansion, and acquisition of capital assets.

Several documents describe the SFMTA's need for capital investments, most notably the 20-Year Capital Plan and the 5-Year Capital Improvement Program (CIP). These planning documents support the SFMTA's overarching strategic goals:

- Create a safer transportation experience for everyone.
- Make transit and other sustainable modes of transportation the most attractive and preferred means of travel.
- Improve the quality of life and environment in San Francisco and the region.
- Create a workplace that delivers outstanding service.

Formally updated every two years, the most recent 20-Year Capital Plan was updated in November 2021. The purpose of the Capital Plan is to identify and characterize all the SFMTA's potential capital investments needed to achieve the City's transportation goals. It is a financially unconstrained document, meaning that it includes capital needs for which funding has not yet been identified or committed. It also provides the foundation for developing the fiscally constrained 5-Year CIP and the 2-Year Budget. A capital project must be included in the 20-Year Capital Plan to be eligible for inclusion in the 5-Year CIP. The 2021 Capital Plan identifies over $31.3 billion in potential SFMTA capital investments over the next 20 years.

Like the 20-Year Capital Plan, the 5-Year CIP is formally updated every two years. The SFMTA's 5-Year CIP is a fiscally constrained program of capital projects that is organized into 10 Capital Programs: Communications/IT, Facility, Fleet, Parking, Security, Traffic Signals, Streets, Taxi & Accessible Services, Transit Fixed Guideway, and Transit Optimization & Expansion.

The FY2023-27 CIP was adopted on April 19, 2022. It includes approximately $2.6 billion dollars across more than 178 projects that the SFMTA plans to implement during the next five years. Of these investments, $1.85 billion correspond towards State of Good Repair investments. These projects will improve the safety, reliability, equity, and efficiency of San Francisco's transportation system.

The Asset Management Unit supports the capital planning process by incorporating asset data at key steps along the process based on lifecycle analysis of our capital asset inventory. In coordination with Capital Program Managers and Asset Maintainers, AMU staff identifies long range capital replacement needs, supports investment allocations in existing infrastructure, tracks infrastructure condition, and tracks planned and actual investment trends. The Asset Management Unit anticipates playing a prominent role in future budget cycles to facilitate decision-making for capital investments, helping to ensure that funding is provided for critical deferred maintenance and replacement needs.

II. State of Good Repair

State of Good Repair Defined

State of Good Repair is the condition in which a capital asset can operate at a full level of performance.

The SFMTA defines an asset as being in a State of Good Repair if the asset can function at a full level of performance. Investments that contribute to realizing a full performance from an asset are qualified as State of Good Repair investments. This definition excludes projects or capital investments in which the primary purpose is to enhance or expand the transportation system. However, new assets that are introduced to the transportation system through enhancement or expansion projects are added to the Capital Asset Inventory upon substantial completion. This ensures that the project's assets will be included in future assessments of the transportation system's long-term rehabilitation and replacement needs.

The SFMTA currently evaluates whether an asset or asset class is in a State of Good Repair using the TERM Lite tool developed by the Federal Transit Administration. The TERM Lite model produces a "condition score" for all assets in the Capital Asset Inventory on a scale of one (Poor) to five (Excellent). The cumulative, value-weighted average of all asset condition scores in the Capital Asset Inventory determines the SFMTA's overall condition score. The FTA defines a transportation system in which assets receive an overall condition score of 2.5 or better as being maintained in a State of Good Repair.

Currently, the SFMTA generates this score based solely from asset age, which shows an asset's condition score deteriorating as it reaches the end of its scheduled useful life. It does not reflect specific operating conditions, level of use, or other factors that impact the performance and operating life of an individual asset. A key component of the 10-Year Asset Management Strategy is to incorporate additional factors into condition scoring, such as an inspected operating condition. Accordingly, the SFMTA will start to incorporate use-based condition data to better model the condition of its assets. So far, this type of data has been provided through the following condition assessments:

- ongoing traffic signal condition assessment.
- facilities assessment scoping discussions were completed, and the RFP is currently being finalized
- upcoming condition assessment of all Muni Metro stations
- upcoming street curb and facilities assessment of Sustainable Streets related assets
- ongoing overhead line pole inventory update is in the field work stage

This refined condition scoring will support more precise State of Good Repair assessments and more data-driven investment decision and project development. The key elements of State of Good Repair include:

Function

The transportation asset can fully perform its designed function.

Safety

The transportation asset does not pose any safety risk to employees or the public.

Value

The transportation asset performed within its useful life at its planned cost.

Capital Asset Inventory

The Capital Asset Inventory is a registry of the SFMTA's physical infrastructure that contains critical information about each asset such as in-service date, estimated useful life, and replacement value. The SFMTA can use this information to understand future needs of the SFMTA by modeling replacement and rehabilitation cycles.

Currently, the Capital Asset Inventory represents a point in time snapshot of capital assets which is updated annually, but the goal is to connect the inventory to active data systems and business processes to provide a more real time picture. Linking the Capital Asset inventory to active data systems, including both maintenance and accounting systems, is also key for measuring the success of our capital investment strategy as documented in the SFMTA's Capital Improvement Programs (CIPs).

Beginning in 2014, the SFMTA has updated the CAI on an annual basis. These annual revisions include updating changes to capital assets, refining asset models, and ensuring the asset registry accurately reflects current state of the transportation infrastructure. Today, the CAI includes nearly 5,000 individual entries, categorized between different asset classes and CIP Programs. The assets are also segmented between "Transit Service Critical" or "Other State of Good Repair" assets. These categorizations provide further insight to the SFMTA when prioritizing State of Good Repair investments.

SFMTA assets can be categorized from the Capital Asset Inventory into a variety of hierarchies and attributes depending on the type of analysis that is required of the data. The Asset Management Unit is responsible for structuring the data so it can serve various reporting and analysis needs, such as supporting the FTA's NTD report and the Metropolitan Transportation Commission's RTCI database.

Categorizing Assets

Assets are categorized into Asset Classes which were developed in 2009 to align with the FTA's asset reporting categories. Since SFMTA functions also as a DOT, new asset classes were added to reflect non-transit infrastructure. Investments in these assets occur via capital projects which are sorted by SFMTA Capital Program to link with the capital planning process. This report uses both Asset Classes and Capital Programs to report upon State of Good Repair needs and investments. To facilitate trend comparison, the 2021 Report will continue to use the original 2009 Asset Classes.

The SFMTA categorizes State of Good Repair needs as either "Transit Service Critical" or "Other State of Good Repair". Transit Service Critical investments are made in Asset Classes and Capital Programs 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 State of Good Repair signifies areas of investment that help to make transit service comfortable and efficient for riders, along with maintenance of non-transit assets related to pedestrian, bicycle, enforcement, and administration infrastructure. Figure 3 outlines the Asset Classes as either Transit Service Critical or Other State of Good Repair.

FIGURE 5: STATE OF GOOD REPAIR CATEGORIZATION

	Asset Class	Capital Program	Example Assets
Transit Service Critical	Light Rail Vehicles	Fleet	LRVs, Historic Streetcars
	Motor Coach Vehicles	Fleet	Motor Coaches
	Overhead Catenary System	Fixed Guideway	Trolley Wire, Electrification Infrastructure
	Track	Fixed Guideway	Switches, Rail
	Train Control & Communications	Communications / IT, Fixed Guideway	Automatic Train Control System, Radio
	Other Systems / Vehicles	Fleet, Communications / IT	Cable Cars,
Other State of Good Repair Assets	Facilities	Facility	Administrative Buildings, Maintenance Buildings
	Parking & Traffic	Parking, Signals, Streets	Parking Garages, Traffic Signals, Parking Meters
	Stations	Facility	Muni Metro Stations
	Other Systems / Vehicles	Communications / IT	CCTV, Non-revenue vehicles

2021 Capital Asset Inventory Update

The FY2021 State of Good Repair Report is based on an updated Capital Asset Inventory registry that was used in subsequent reports. As per the 10-Year Asset Management Strategy, the data in this inventory has been reviewed – to true-up entries from FY2020 – as well as built upon with significant FY2021 capital project investments.

The AMU strives to ensure the asset registry reflects the reality of the SFMTA's infrastructure; however, some asset classes have better quality data than others and some asset types are not fully reflected in the inventory. Asset classes that are more regulated such as revenue vehicles, track, and overhead lines have the highest quality data. Asset classes related to our Sustainable Streets Division such as bike lanes, soft hit posts, and street paint; and our IT Division such as computer systems, phone systems, and data networks are either not represented in the inventory or are roughly modeled based on available information. Some assets are in the middle, such as facilities, subway stations, and tunnels. These are included in the inventory, but need additional work to refine their lifecycle models by further breaking down these large assets into more discrete sub-systems to refine replacement costs and estimated useful life.

While reviewing and updating the CAI are key steps in the 10-Year Asset Management Strategy, there remains work to be done to further increase the usefulness of the inventory. Future steps include obtaining cost and date-built information for all assets not in the inventory such as painted bus bulbs, bike racks, parking meters, soft hit barriers and bus stops. Performing and incorporating condition assessments of all assets would also make inventory analysis more accurate and credible, particularly in informing the asset condition scores in a State of Good Repair analysis. The following represent some key updates reflected in the new 2021 Capital Asset Inventory:

- Added Parking Access and Control System
- Updated six facilities that completed fire life safety upgrades
- Retired 3 1995 Breda Light Rail Vehicles and added a 2017 Siemens
- Retired 33 Motorbus Vehicles from 1999 and 2007; Updated useful life and replacement cost data for Motorbus Vehicles
- Updated replacement cost data for Trolleybus Vehicles
- Retired 4 Automobiles; Added 1 Minivan; Updated useful life for Automobiles and Vans

TERM Lite Modeling Tool

Assists in evaluating the SFMTA's current State of Good Repair asset backlog, future investment needs, and different funding and prioritization scenarios.

The FTA's Transit Economic Requirements Model Lite (TERM Lite) is a computer application designed to simulate an agency's transit capital investment needs over an extended time horizon. The model estimates the total amount of annual capital expenditures required for a 20-year period to maintain or improve the physical condition and performance of an agency's transit infrastructure. Specifically, the TERM Lite tool determines levels of investment required to maintain or improve asset condition, assesses the impact of investment scenarios on asset conditions, and simulates future needs with age-based asset decay

formulas. The tool produces Asset Condition Scores, projects Future Investment Needs, and provides a reported Asset Backlog.

Condition scores are based on the estimated 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. The TERM Lite condition scores use a scale of 1 (poor) to 5 (excellent), with assets approaching one 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 SFMTA's reported Asset Backlog is calculated based on scheduled useful life and replacement value of an asset. When an asset is first capitalized and entered into the CAI, it is given an estimated useful life approximating the number of years the asset will be operable in a State of Good Repair. Useful life estimates are based on several factors including manufacturer recommendations, FTA guidelines, and subject matter expert input. When an asset comes to the end of its estimated useful life, TERM Lite reports the asset is in a status called backlog. An asset reported in backlog is measured by its full replacement value. As with the condition score, the reported Asset Backlog does not account for specific conditions of operation, level of use, or other factors that would adjust the anticipated useful life of an asset.

The FY2021 State of Good Repair analysis is based on a 20 year simulation that projects out asset replacement cycles, condition decay, and costs. The 20 year model projection aligns with the SFMTA's 20 year capital plan. It also ensures that the results are as accurate and useful as possible. As the time horizon moves farther out from the present, it becomes exponentially harder to accurately forecast State of Good Repair needs, replacement schedules, and asset condition scores.

The FY2021 State of Good Repair analysis is also based on assumptions of unconstrained spending and 3.5% inflation. The inflation rate aligns with the capital construction escalation rate determined by the City and County of San Francisco. While inflation is abnormally high right now, it is impossible to predict what the rate will be moving forward. Therefore, 3.5% is an appropriate baseline number to use based on historical trends and the capital construction escalation rate. The SFMTA plans to incorporate additional scenario testing once the inventory is added to PSD Citywide. One of those scenarios will be higher or lower than expected inflation. Performing a simulation based on unconstrained resources provides a best case scenario for asset replacement cycles. With this data, investment priorities and trade-offs can more easily be communicated based on available funding.

Through obtaining and incorporating accurate asset condition scores, the SFMTA can more accurately report on the condition of assets and improve forecasting of needed future investment.

III. 2021 State of Good Repair Analysis

Asset Replacement Value

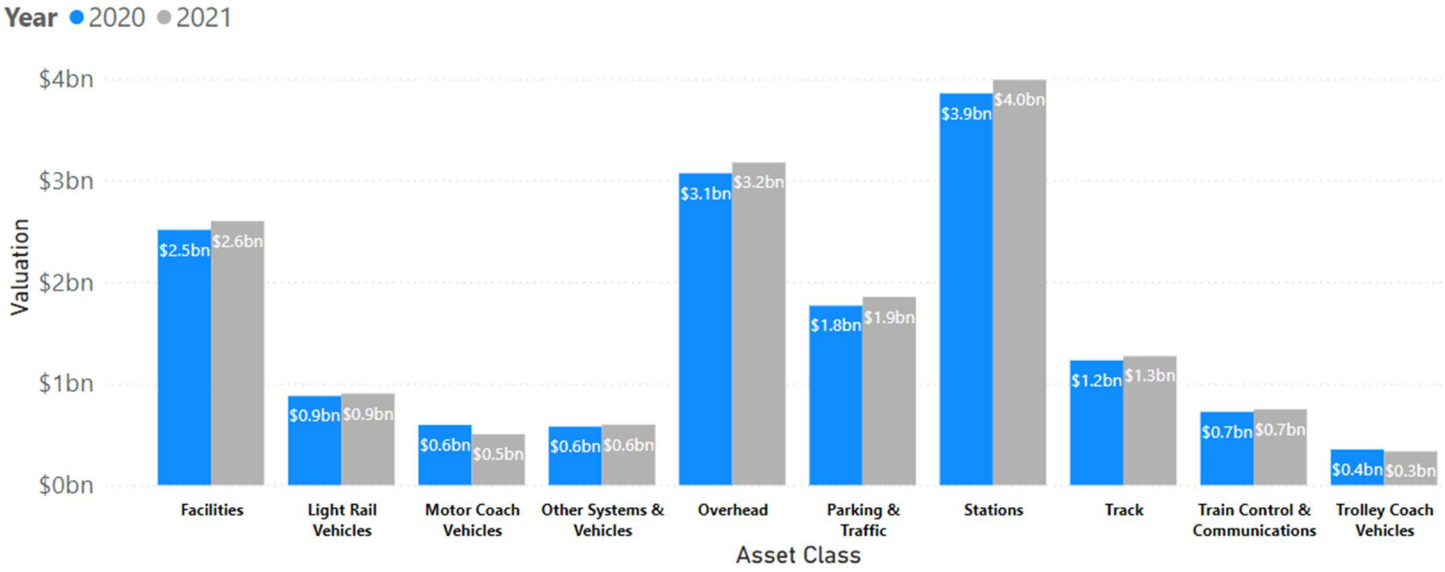
The term "replacement value" refers to the amount that the SFMTA would have to pay to replace an asset at the present time. This value helps estimate the future need that the SFMTA is responsible for to keep up with the regular cycle of rehabilitation and replacement of its capital assets.

The FY2021 State of Good Repair analysis calculates a total replacement value of $15.97 billion for the SFMTA's assets. Figure 6 shows total reported replacement value for all recorded assets by asset class compared with the previous year. There are two factors that impact the asset replacement value; adding or removing assets to the capital asset inventory and updating the estimated replacement cost of an existing asset.

The key takeaway of asset replacement value is the distribution of asset value across the different categories to identify where the risks, liabilities and needs for capital resources exist across the SFMTA's infrastructure portfolio. Asset replacement value is also used to validate the accuracy of items represented in the SFMTA's capital asset registry.

The increase in asset replacement value for FY2021 is due to applying a 3.5% inflation rate to assets where the replacement cost data was not changed from last year. This explains the increase in replacement cost for Facilities, Light Rail Vehicles, Other Systems & Vehicles, Overhead, Parking & Traffic, Stations, Track, and Train Control & Communications. The reason that Motor Coach Vehicles saw their replacement cost go down is because 33 vehicles were retired from the fleet and more accurate, updated replacement costs were used that were lower than the replacement costs in last year's inventory. The replacement cost for Trolley Coach Vehicles was also adjusted which led to the total replacement value going down for that category as well.

FIGURE 6: TOTAL REPLACEMENT VALUE BY ASSET CLASS



Reported Asset Backlog

The reported asset backlog is the replacement value of assets older than their estimated useful life. In FY2021, the SFMTA's reported asset backlog is $4.07 billion.

All assets in the Capital Asset Inventory contain data about their estimated useful life. Estimated Useful Life is defined as the maximum period during which an asset will serve its intended use. This estimated useful life is based on manufacturer recommendations, FTA guidelines, and subject matter expert input. When an asset comes to the end of its estimated useful life and is not replaced it is considered in the backlog. An asset reported in backlog is measured by its full replacement value. As the number of assets reported in backlog grows, the total amount of investment needed to replace those assets grows as well.

The SFMTA's FY2021 reported asset backlog has a total value of $4.07 billion. Figure 7 shows that the SFMTA's reported asset backlog rose from $3.83 billion in FY2020 to $4.07 billion in FY2021. The 2021 reported asset backlog is comprised of $1.25 billion in Transit Service Critical assets and $2.82 billion in Other State of Good Repair assets.

The reported asset backlog growth is partially due to challenges completing capital projects due to COVID-19. While projects are currently in progress that will significantly decrease the assets in the backlog, the projects cannot be realized in the inventory until they are completed. Additionally, the breakdown between Transit Service Critical and Other State of Good Repair assets shows the SFMTA has been ultra-focused on assets that are critical to providing service. While this intuitively makes sense, it is important to also prioritize supporting assets that aid the overall health of the SFMTA system. Figure 8 details the reported asset backlog by Asset Class, showing that the SFMTA's Parking & Traffic assets have the highest reported backlog at $1.19 billion.

FIGURE 7: REPORTED ASSET BACKLOG

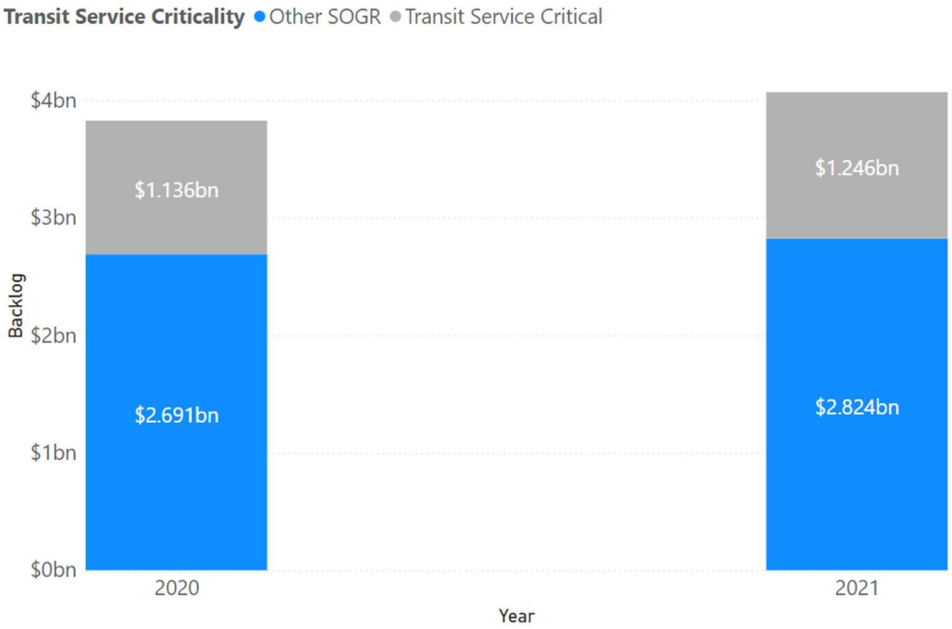
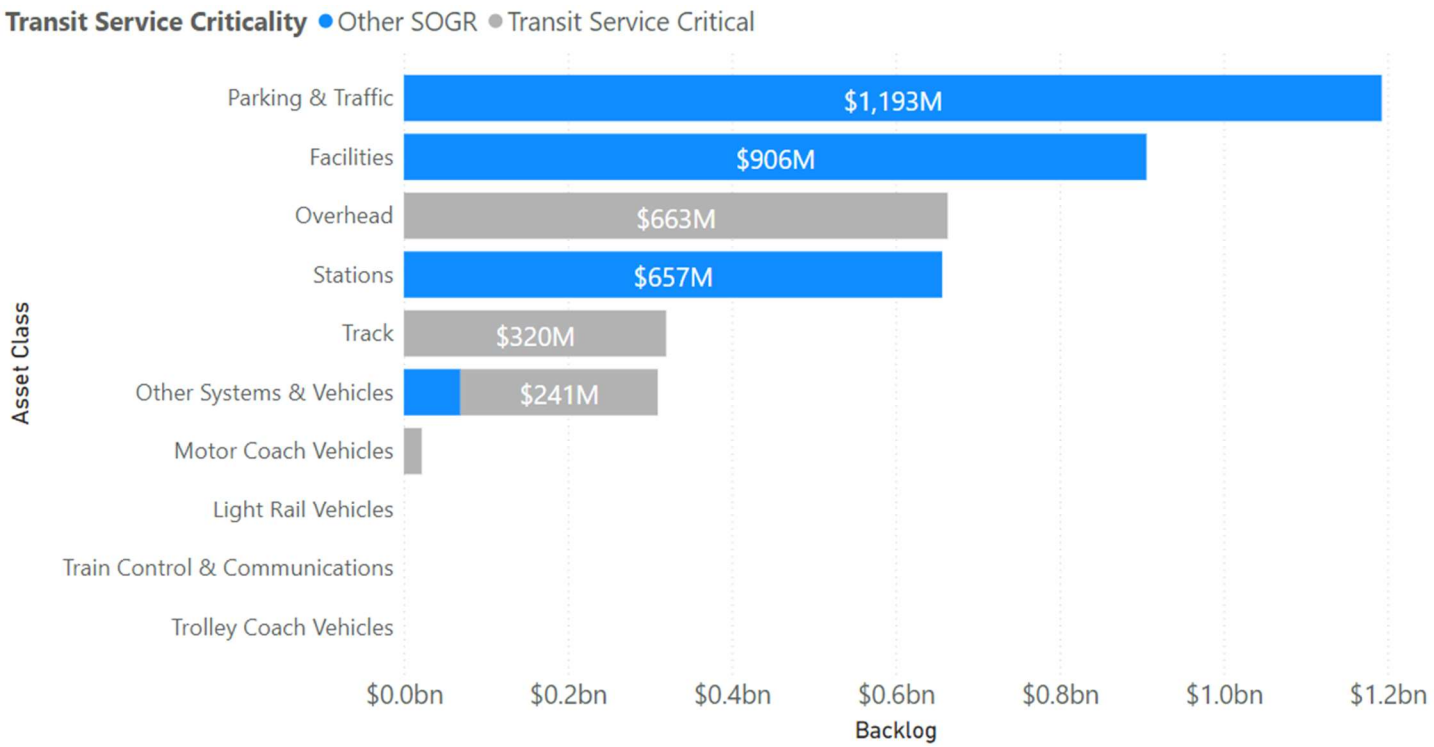


FIGURE 8: REPORTED ASSET BACKLOG BY ASSET CLASS



While the reported backlog value is a useful goalpost to measure the SFMTA's progress in maintaining a State of Good Repair, it is one of many data points to consider when informing future investment decisions. Here are key considerations when reviewing the backlog.

- It is possible for an asset in the backlog to perform as intended beyond its estimated useful life with increased inspection and maintenance, but at increased risk.
- Not all assets represented in the backlog require full replacement. The backlog represents assets where an end of life decision needs to be made; either these assets will be retired due to future service needs, replaced in-kind, or upgraded with new technology or systems.
- Asset classes reporting no backlog may still require high levels of investment in future years. Investment decisions need to consider both the backlog and the projected replacement needs represented later in this report. For example, the SFMTA is facing a high investment need required to replace the Train Control System within the next decade.

To adjust for these discrepancies, the SFMTA will continue to verify asset dates and place a strong emphasis on condition assessments moving forward. By ensuring asset information is current in the CAI and incorporating condition assessments to better inform investment priorities, the SFMTA will have a more accurate reported asset backlog and clearer understanding of the deferred replacement need.

Asset Condition Scores

Asset Condition Scores are based on the age of an asset and use a scale of 1 to 5. The weighted average condition score for all SFMTA assets in FY2021 is 3.01.

The TERM Lite model produces a "condition score" for each asset in the capital asset inventory. These condition scores are based only on the estimated 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. Part of the Condition Assessment Program is to conduct condition assessments of the SFMTA's assets and generate usable metrics to gain a better understanding of each asset's useful life.

The TERM Lite condition scores use a scale of 1 (poor) to 5 (excellent) with scores for assets declining as they age. Asset with a score 2.5 or higher are within a State of Good Repair. While this section primarily focuses on overarching trends, more specific trends and numbers for each individual asset class can be found in the asset class pages following this section.

The SFMTA incorporates a weighted average based on total replacement cost. This creates a more accurate representation of the State of Good Repair of SFMTA assets. For example, it is more detrimental if a high-value asset has a low condition score than a low-value asset.

2021 Asset Condition Score

FIGURE 9: COMPARISON OF CONDITION SCORES, 2020 VS. 2021

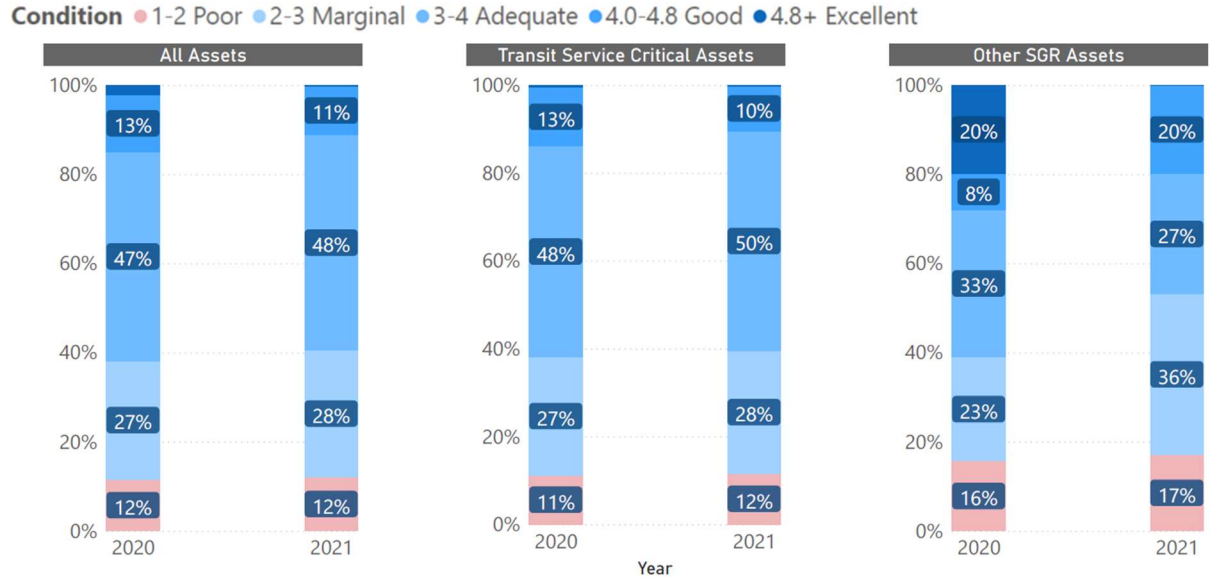


Figure 9 displays asset condition score by Transit Service Critical and Other State of Good Repair assets. Transit Service Critical assets have a substantially higher average condition score than Other State of Good Repair assets. TSC assets score a weighted 3.24 on the scale which translates to an Adequate condition category. OSGR assets are scored at 2.74, labeling these assets as Marginal in their condition category. These scores are a direct result of a policy decision to prioritize investments in TSC assets over

Other SGR assets. One trend that jumps out is the 20% of Other SGR Assets that moved from excellent to good. This is primarily due to a number of Preformed Thermoplastic assets that aged by one year moving from Excellent to Good condition.

Figures 10 and 11 provide detailed breakdowns of asset condition by Capital Program and Asset Class, respectively. The data affirms that the SFMTA's State of Good Repair efforts have had positive results on the condition scores of Transit Service Critical assets such as the revenue fleet; but that other State of Good Repair assets, including non-revenue vehicles (Other Systems and Vehicles) and parking assets (Parking & Traffic), have received reduced investment amounts.

The SFMTA recognizes the importance of maintaining the supporting infrastructure and has already begun taking steps to improve asset condition in lower rated categories. One prime example is an ongoing parking and traffic project that is replacing all parking meters across the city.

FIGURE 10: AGE-BASED CONDITION SCORE BY CAPITAL PROGRAM

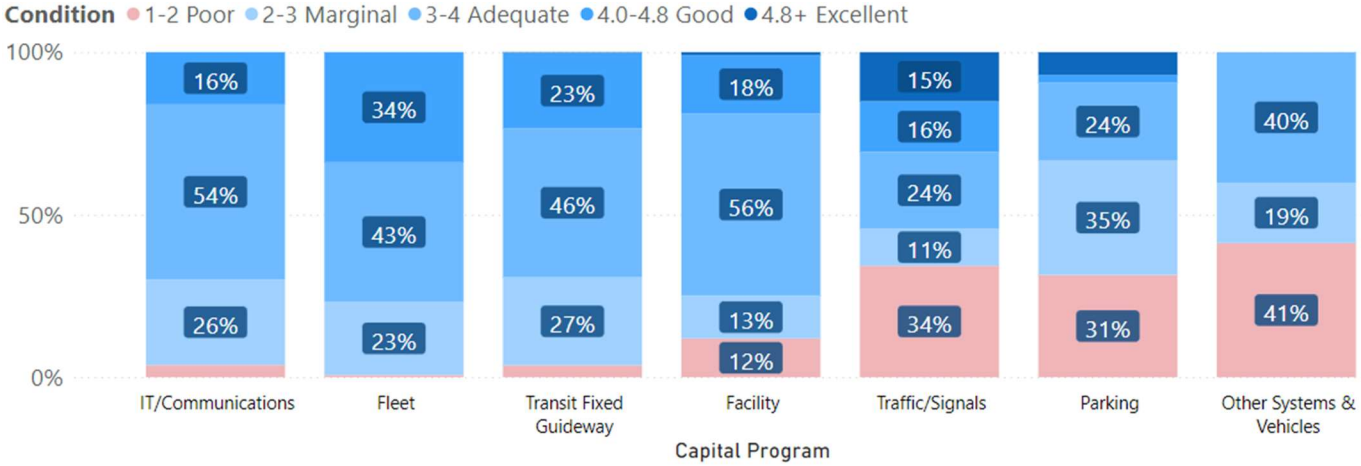
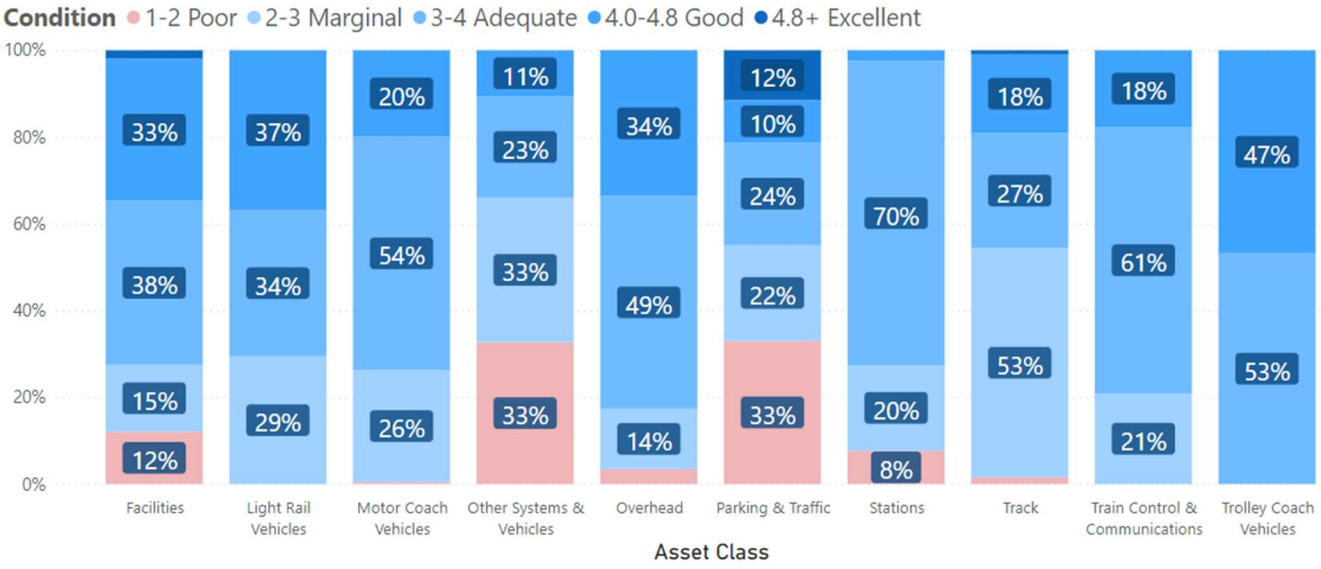


FIGURE 11: AGE-BASED CONDITION SCORE BY ASSET CLASS



Asset Condition Score Trends

Figure 12 provides a breakdown of average condition scores by Asset Class over time. The following notes explain the trend in condition scores for each Asset Class. Although the TERM Lite data is only based on the useful life of the assets and does not incorporate the actual operating condition of the assets, it provides a general indicator of the state of the Asset Class across the entire portfolio. Like the backlog data, the age-based condition score is one factor to consider when making investment decisions. Understanding the performance and failure risks associated with the relative age of the infrastructure also guides investment allocations.

FIGURE 12: ASSET CLASS CONDITION SCORES FROM 2015 – 2021

Asset Class	2015	2016	2017	2018	2019	2020	2021
Facilities	3.2	3.2	3.3	3.3	3.2	3.0	3.0
Light Rail Vehicles	3.8	3.8	3.7	3.8	3.8	3.6	3.4
Motor Coach Vehicles	3.7	3.5	3.7	3.6	3.4	3.3	3.4
Other Systems & Vehicles	3.0	3.1	3.1	2.6	2.6	2.4	2.4
Overhead	3.7	3.7	3.6	3.5	3.4	3.4	3.4
Parking & Traffic	2.8	3.0	2.9	2.4	2.4	2.3	2.3
Stations	3.1	3.1	3.1	3.0	3.0	2.9	2.9
Track	3.3	3.2	3.2	3.1	3.2	3.1	3.0
Train Control & Communications	3.7	3.6	3.5	3.4	3.8	3.8	3.7
Trolley Coach Vehicles	3.4	3.3	3.2	3.6	4.2	3.8	3.4

Notes on Condition Score

- Condition score is weighed by asset value. The impact of an asset classes score on the SFMTA aggregate score is a direct function of the proportion of the replacement value of a class to the total SFMTA replacement value.
- Facilities assets typically have high replacement values and long estimated useful lives which is reflected in the slow and consistently declining score. Upcoming investments in SFMTA's oldest facilities as identified in the Building Progress facilities renewal program will raise this score in subsequent reports and the overall SFMTA score.
- Revenue vehicles in the Light Rail, Motor Coach, and Trolley Coach asset class categories are routinely replaced. Procurement years are identified by years with score increases.
- Other Systems and Vehicles asset class is primarily composed of non-revenue service vehicles; these represent a relatively small proportion of the SFMTA's total assets. Improving the value weighted score would require a comparatively small investment but also have the smallest impact on overall SFMTA score.
- Parking and Traffic represents the SFMTA's parking garages and traffic signals which have received less investment compared with Transit Service Critical asset classes.

Guide: Individual Asset Class Pages

Notes on Asset Class Pages

- The Asset Class pages are slightly different from prior years.
- Please refer to the guide below for keys to understanding the new layout, particularly the new graphs.

Asset Class Legend
- Facilities
- Light Rail Vehicles
- Motor Coach Vehicles
- Other Systems & Vehicles
- Overhead
- Parking & Traffic
- Stations
- Track
- Train Control & Communications
- Trolley Coach Vehicles

*This graph will depict how the asset class condition score **ranks against other asset classes** from year-to-year.*

*It shows **ranked order**, not the yearly condition score trend (see graph on for yearly condition score trends).*

The colors from the left and the right graphics are the same for each asset class (and match the legend to the right).

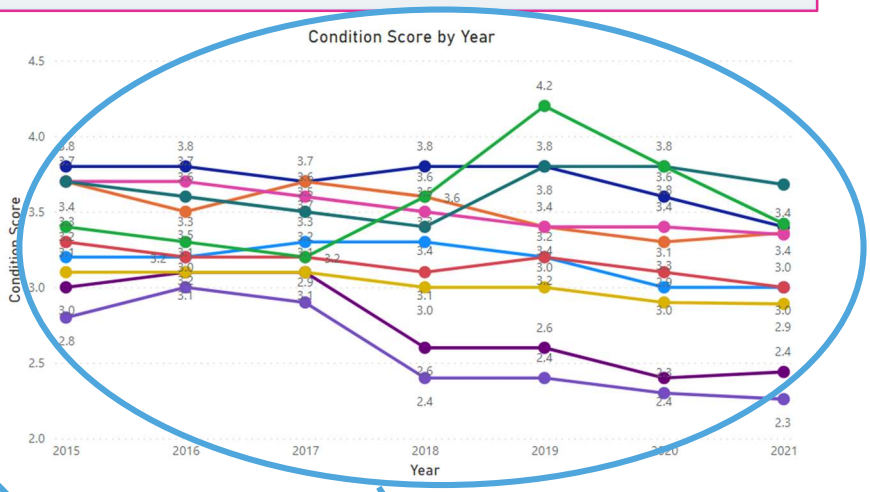
On the following pages, the bolded ribbon (with data labels) is the featured asset class.

Asset Class Name

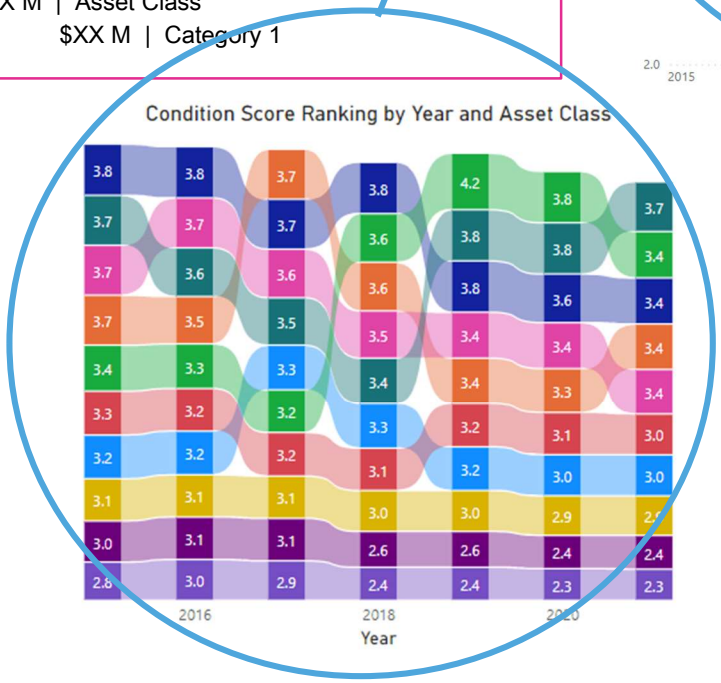
Asset Replacement Value
These assets represent X% of all SFMTA Assets
$XX M | All Overhead Assets
$XX M | Category 1

Condition Score
X.X | All Overhead Assets

Backlog
$ XX M | Asset Class
$XX M | Category 1



This graph will show the yearly condition score trend for the page's asset class.



FY23-27 Capital Improvement Program Planned Investment

Project One: A summary of the project from the FY23-27 Capital Improvement Plan

…

Did you know….

Additional facts and figures about the asset class.

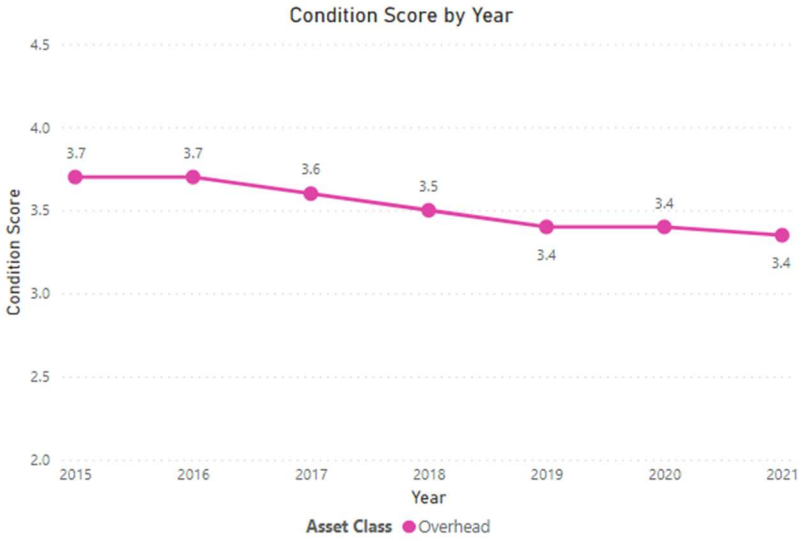
Overhead

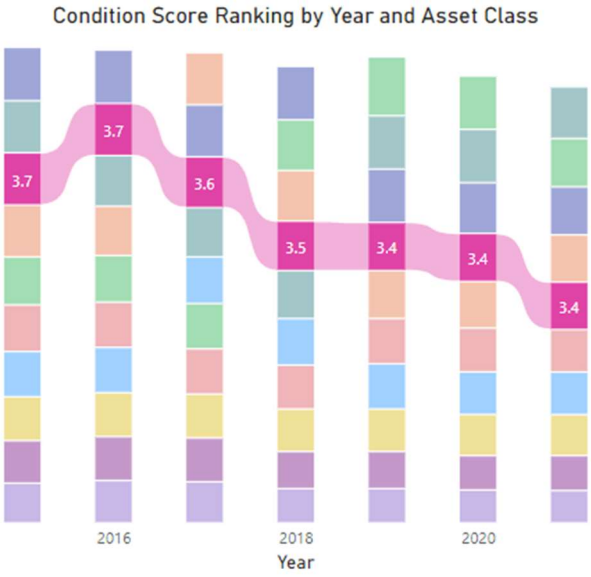
Overhead lines are used to transmit power to support electrically powered trolley coaches, light rail vehicles, and historic streetcars.

Asset Replacement Value
These assets represent 20% of all SFMTA Assets
$3.2 B | All Overhead Assets

Condition Score
3.4 | All Overhead Assets

Backlog
$ 663 M | Overhead
- $559 M | Trolley Wire
- $46 M | Feed Span
- $42 M | Tangent Span
- $14 M | Decorative Streetlighting





Sections of the overhead line system are regularly replaced through ongoing maintenance activities.

FY23-27 Capital Improvement Program Planned Investment

Islais Creek Bridge Overhead Reconstruction: Design and replace the overhead catenary system (OCS), including the mounting structure and support systems in coordination with the San Francisco Public Works project to rebuild of the Islais Creek bridge.

Rigid Traction Power Feasibility Study: Study the benefits and feasibility of upgrading the current Overhead Catenary System with a Rigid Overhead Conductor Rail System. The study will provide recommendations for future replacement, costs and preliminary design work required to implement a new rigid system.

Did you know….

The electrification system is also referred to as the traction power network.

When Streetcar No. 33 was converted in 1935, it became the first “trackless trolley” to operate in the State of California. Today, the 33-Stanyan still operates on parts of the original route.

SFMTA is responsible for over 10,000 poles with an estimated replacement cost between $40-60k making up nearly 20% of the total replacement value of the overhead line system. We are pursuing an inventorying project which will give us a better sense of this asset class. These poles can be used to generate revenue by leasing to third-party communications and telecom providers.

Train Control & Communications

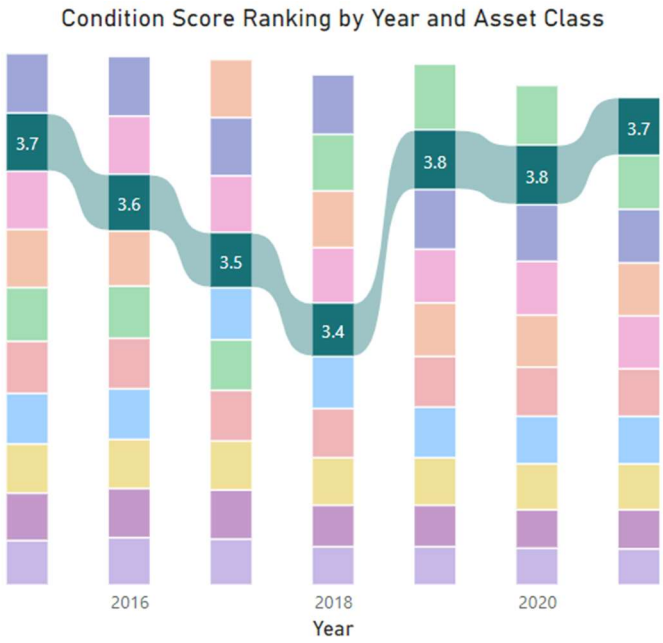
SFMTA's train control system is designed to improve Muni Metro light rail service by providing operations staff with the tools necessary to deliver reliable, speedy, high-frequency transit to, from, and within downtown San Francisco.

Asset Replacement Value
These assets represent 5% of all SFMTA Assets

$746 M | All Train Control & Communications Assets
$309 M | Light Rail Control & Communications
$199 M | Commuter Rail Control & Communications
$57 M | Passenger Emergency Phones
$21 M | CCTV
$156 | Misc. Control & Communications Assets

Weighted Condition Score
3.68 | All Train Control & Communications Assets

Backlog
$0 | All Train Control & Communications Assets



Key SFMTA projects planned for the next five years include substantial investment in a modern train control system. These projects will help to make the Fixed Guideway system more reliable, safe, and comfortable for the passengers who currently rely on fixed guideway routes.

FY23-27 Capital Improvement Program Planned Investment

Train Control System Upgrade: Plan, design, procure and install the next-generation communications-based train control (CBTC) system for the rail network, including surface and subway alignments. Investing in a new CBTC system will bring the train control system into a state of good repair and will result in a more efficient, reliable, and safe way to manage LRV traffic. The CBTC system will improve transit service by reducing congestion-related delays, providing more consistent travel times, reducing headways and will improve overall system safety for all Muni Metro LRV lines.

Did you know….

Four of the eight assets with the highest replacement values are Train Control & Communications assets, even though there are only 22 total Train Control & Communications assets.These four assets range from $308 M to $192 M. They are all centralized train control systems for commuter and light rail.

Communications technology at the SFMTA uses WiFi or cellular connections to precisely track and continually communicate with every LRV in service.

Facilities

SFMTA's facility campus includes a varied group of buildings, grounds, and bus yards. These facilities support the SFMTA's ability to provide reliable transit service, maintain street infrastructure, and store, protect and maintain its diverse transit fleet.

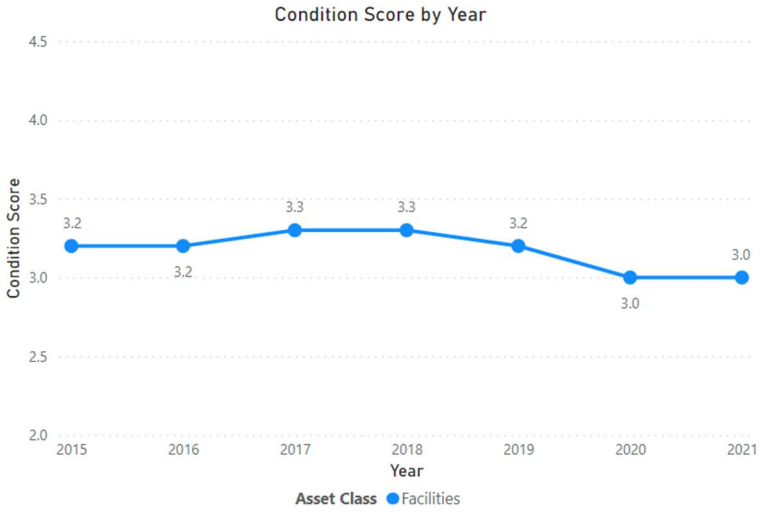
Asset Replacement Value
These assets represent 16% of all SFMTA Assets

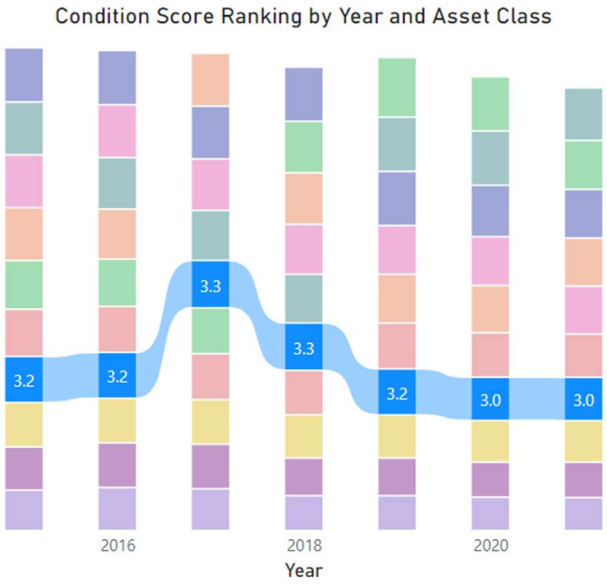
$2.60 B | All Facilities

Backlog
$905 M | All Facilities

Weighted Condition Score
3.00 | All Facilities

Average Condition Scores
2.90 | Maintenance Facilities
2.94 | Administrative Facilities
3.10 | Combined Maintenance & Administrative





The Facilities Program supports the modernization and expansion of outdated facilities to make them safe and efficient, as well as acquiring new facilities to accommodate fleet growth.

FY23-27 Capital Improvement Program Planned Investment
The FY23-27 Capital Improvement Program highlights a $202.12 investment across 12 facilities projects over the next five years. See below for a sample of these Facilities projects:

Facility Condition Assessment Implementation: Address backlogged State of Good Repair Projects.

Castro Station Accessibility Improvement: Install a new four-stop elevator on the south side of Market Street at the Castro Muni Station

Potrero Yard Modernization Project: Replace the obsolete two-story maintenance building and bus yard located at Bryant and Mariposa streets with a modern, three-story, efficient bus maintenance and storage garage, equipped to serve the SFMTA's growing fleet as it transitions to battery electric vehicles. Construction is expected to begin in 2023.

Did you know….

The Potrero Yard Modernization Project is also a housing project.

The new facility will have three main levels for bus maintenance and storage that will measure up to 75 feet in height from the corner of Mariposa and Bryant streets. The modern yard will be able to store 213 buses or approximately 50 percent increase in capacity. But the City and SFMTA are also proposing approximately 560 residential units that include seven (7) additional floors above the bus facility. Developers will submit proposals that must include 50% affordable units, but are challenged to maximize the number of affordable units, up to 100%.

Light Rail Vehicles

The Muni light rail vehicles operate 21 hours per day, 365 days per year to provide vital transit service for 49 million riders annually. The light rail vehicle fleet consists of LRV2, LRV3, and the newest, LRV4 model vehicles. Additionally, Muni operates three types of Historic Streetcars: President's Conference Cars (PCCs), Milan Cars, and Antique Streetcars.

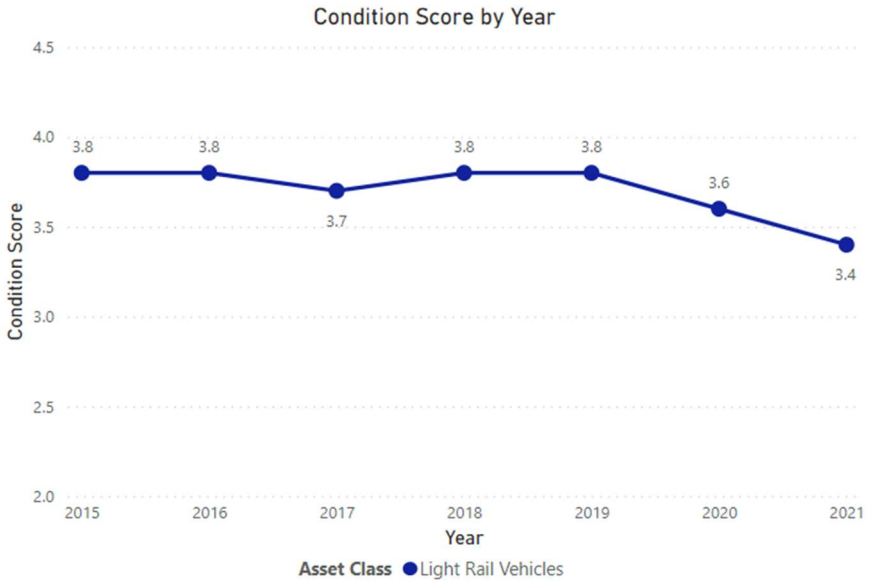
Asset Replacement Value
These assets represent 6% of all SFMTA assets.

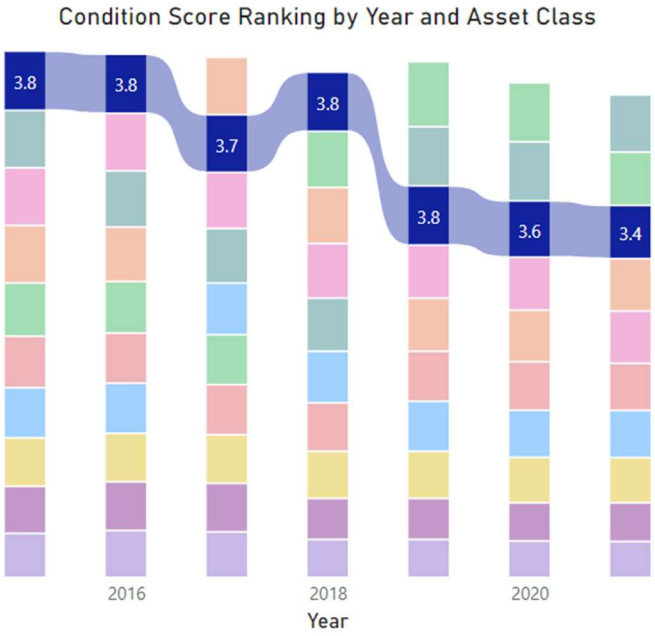
$783 M | Light Rail Vehicles
$118 M | Historic Streetcars

Backlog
$0 I All Light Rail Vehicles

Weighted Condition Score
3.41 | All Light Rail Vehicles

Average Condition Scores
3.46 | Light Rail Vehicles





For the last six years, light rail (LRV) and historic vehicles were maintained in adequate condition.

FY23-27 Capital Improvement Program Planned Investment

Light Rail Vehicle Fleet Replacement & Expansion: Procure 151 replacement LRVs and 68 additional LRVs to expand the fleet to 219 trains to replace LRV2 & LRV3 trains manufactured by Breda and are nearing the end of their useful life. The expanded fleet of LRV4s is manufactured in California by Siemens. These new trains will support transit service to Central Subway and expand service citywide. These new state-of-the-art trains improve transit reliability, safety, and passenger comfort.

Paratransit Fleet Expansion: Procure expansion paratransit cutaway vehicles to meet growing paratransit service demand. By proactively planning for the anticipated population growth and increased service demand of the paratransit fleet, the SFMTA ensures that paratransit service is reliable and comfortable for people with disabilities who cannot access the fixed-route transit system.

Did you know….

SFMTA maintains a fleet of trolleys, trams, and streetcars from global cities, including Zurich, Milan, Melbourne, Osaka, and Blackpool.

While light rail vehicles are replaced with a newer model after their 25-year useful lives expire, Historic Streetcars must be completely rebuilt by SFMTA staff after their 100-year useful lives end.

Motor Coach / Trolley Coach

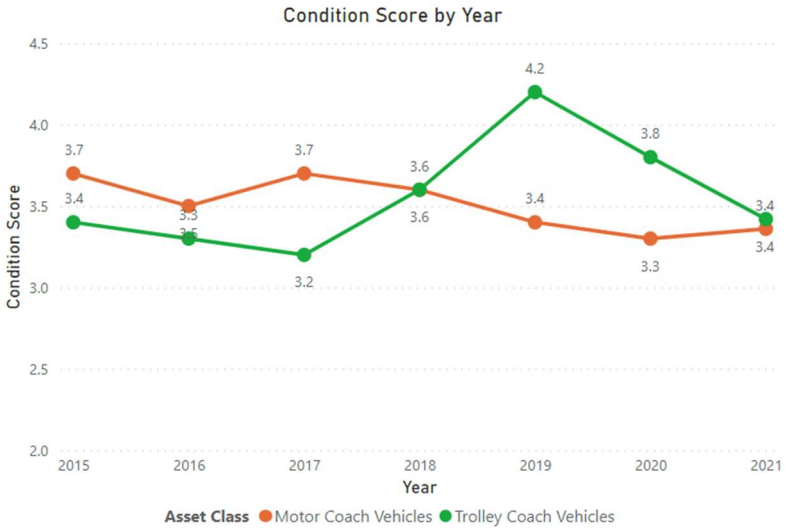
The motor coach fleet consists of low emissions electric hybrid motor coaches that run on battery as well as renewable diesel. The fleet consists of 30 30-foot, 331 40-foot, and 224 60-foot vehicles. The trolley coach fleet runs on 100 percent greenhouse gas-free Hetch Hetchy electricity via overhead wires. The fleet is made up of 93 60-foot vehicles and 185 40-foot vehicles.

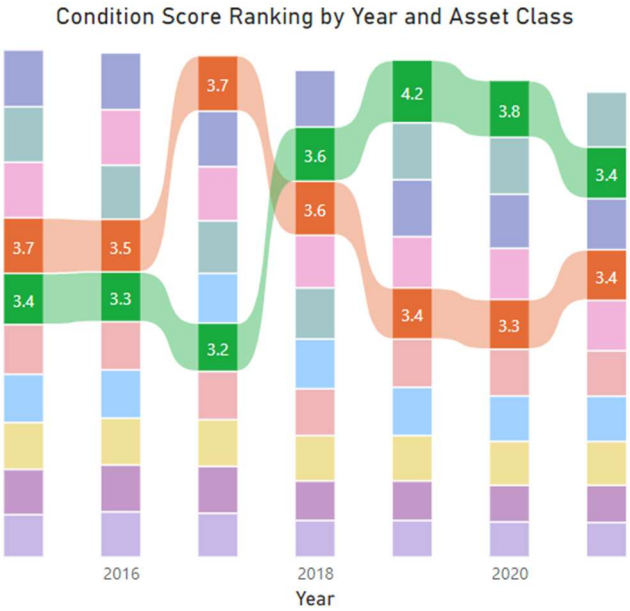
Asset Replacement Value
These assets represent 6% of all SFMTA assets

$500 M | Motor Coach
$331 M | Trolley Coach

Condition Scores
3.36 | Motor Coach
3.42 | Trolley Coach

Backlog
$22 M | Motor Coach
$0 | Trolley Coach





Motor and Trolley Coaches were maintained in adequate condition over the last six years. These vehicles are procured periodically in large batches resulting in extreme highs and lows in condition scores that correspond to asset useful life. Transit Division staff are working to smooth out the fluctuations in condition by doing smaller, more routine vehicle procurements.

FY23-27 Capital Improvement Program Planned Investment

40' & 60' Motor Coach Replacement: Procure 232 40' and 224 60' motor coaches to replace motor coaches that have reached their useful life.

New Flyer Trolley Replacement Energy Storage Systems: Procure up to 70 replacement energy storage systems for 40' and 60' trolley coaches. The energy storage systems are planned for replacement during the midlife overhaul campaigns of our New Flyer.

Did you know….

Muni has the largest trolley bus fleet of any transit agency in the United States and Canada.

Muni's trolley coaches (as well as its streetcars and cable cars) are almost entirely pollution-free because their electric power comes from the city's hydroelectric Hetch Hetchy Water and Power System.

As of FY20, the SFMTA was operating the Green Zones program along the 2, 12, 19, 28, 28R, 43, & 47 routes. A Green Zone is a significant portion of a route where a hybrid electric bus operates on battery power alone.

Stations

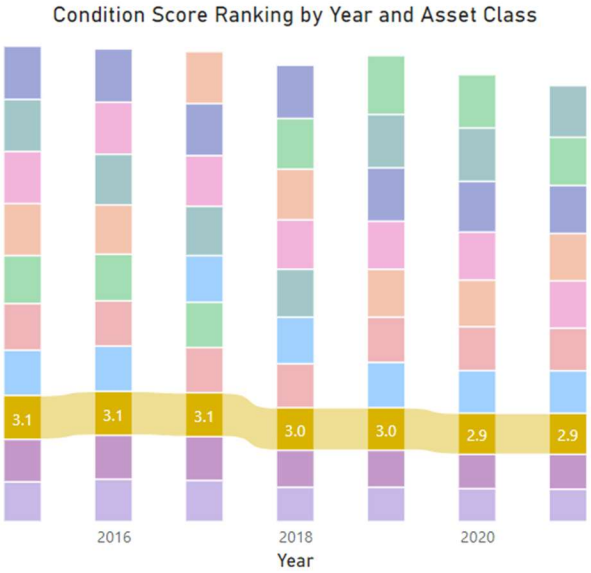
The Muni Metro system includes three tunnels, nine subway stations, and 142 surface platforms and boarding islands.

Asset Replacement Value
These assets represent 25% of SFMTA assets.

$3.99 B | All Stations Assets
$2.57 B | Building
$1.23 B | Guideway
$96 M | Access
$76 M | Complete Station

Weighted Condition Score
2.89 I All Stations Assets

Backlog
$657 M I All Stations Assets



The Muni metro stations are over fifty years old and little is known about the condition of their comprising assets. The condition of all SFMTA stations will be assessed in FY2022 as part of the SFMTA's Condition Assessment Program.

FY23-27 Capital Improvement Program Planned Investment

Station Wayfinding Signage and Upgrade Phase IV: Upgrade station signage at the West Portal, Forest Hill, Van Ness, Civic Center, Montgomery, and Embarcadero stations. Project includes the procurement, fabrication and installation of wayfinding and station identification signage.

Civic Center Substation Upgrade
Replace and upgrade electrical equipment at Civic Center Substation. Upgrading the substation includes replacing and upgrading the utility metering, AC and DC switchgear, rectifier transformer assemblies, fire alarm, security system, station battery system, supervisory control, data acquisition systems, communications systems, and the traction power cables. Investing in these Muni substations will increase the overall reliability

Did you know….

BART has primary capital responsibility for the Market Street stations.

Embarcadero Station has no stairs, only escalators.

The Forest Hill Station is the oldest station west of Chicago.

Track

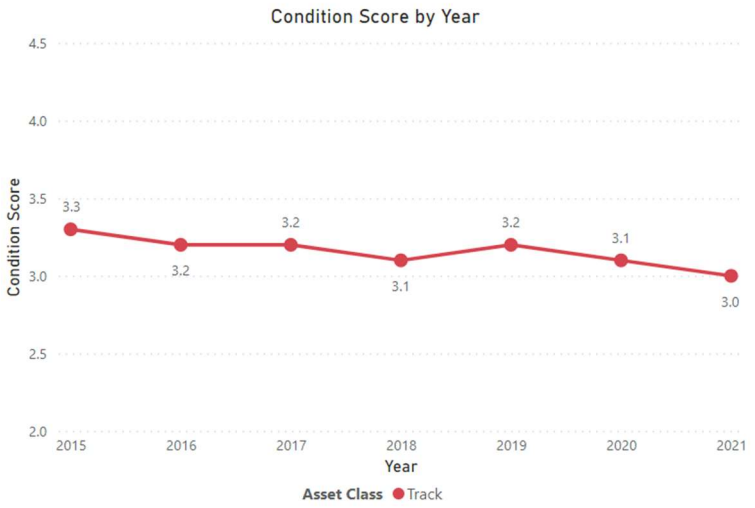
With over 90 miles of track and nearly 300,000 daily trips, the vehicles on SFTMA's fixed guideway routes carry half of its daily ridership. This asset class includes rail, tie and ballast, switches, and other special work.

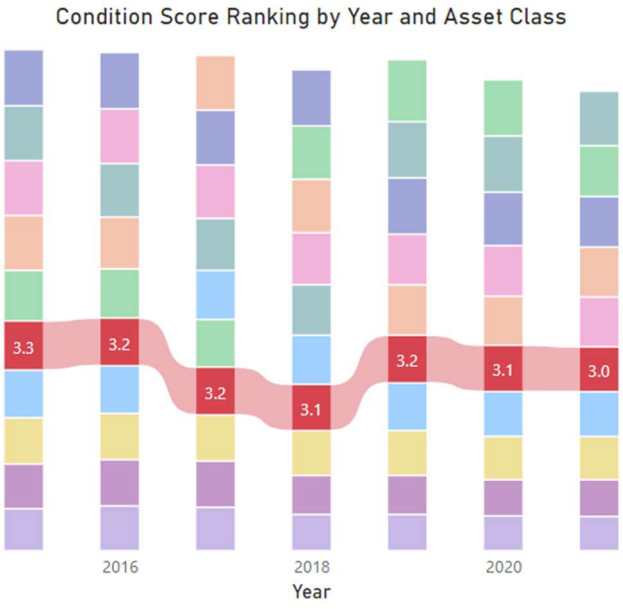
Asset Replacement Value
These assets represent 8% of all SFMTA's assets

$1.27 B | Track
- $389 M | Embedded Track
- $359 M | Direct Fixation Track
- $300 M | Ballasted Track
- $223 M | Special Track

Condition Scores
3.00 | Track

Backlog
$306 M | Track
- $129 M | Embedded Track
- $3 M | Direct Fixation Track
- $45 M | Ballasted Track
- $129 M | Special Track





For the last six years, the track system has remained in adequate condition. Track and guideway related assets are some of the most resource intensive assets for the SFMTA to maintain and replace.

FY23-27 Capital Improvement Program Planned Investment

Cable Car Guideway SGR Program: Enhance the ridership experience for cable car users by improving system reliability and vehicle safety, while preserving this iconic historic resource in revenue service.

Subway Special Trackwork Replacement: Replace special trackwork such as switches and crossovers in the subway at Castro, Duboce, Van Ness, and Embarcadero Stations.

Subway Trackwork Replacement: Replace tangent and curve spans of rail between Embarcadero Station and Castro Station.

Ultrasonic Rail Testing Phase III: Conduct ultrasonic rail testing services for over nine miles trackway to evaluate and establish the condition of the SFMTA's rail network.

Cable Car Curved Track Replacement: Replace ten track curves on the Mason and Powell lines. The curved rails were installed in 1982 and are approaching the end of useful life.

Did you know….

Key Fixed Guideway projects include substantial investment in a systematic replacement of segments of the rail system.

These projects will help to make the Fixed Guideway system more reliable, safe, and comfortable for the passengers who currently rely on fixed guideway routes.

Parking / Traffic

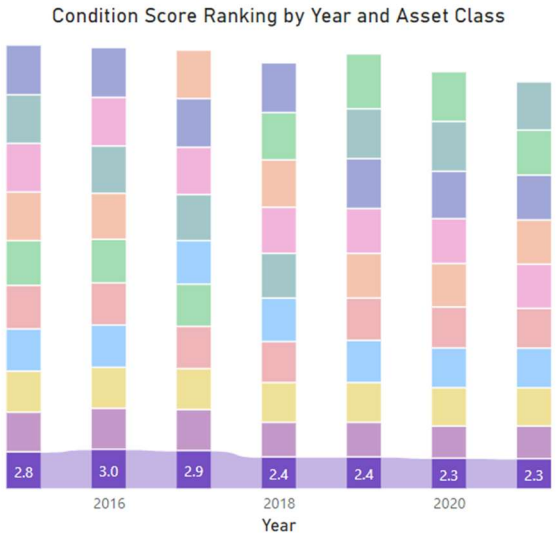
The SFMTA's street and parking assets include all the City-owned parking lots and garages, traffic and pedestrian signals, and thermoplastic paint that indicate bike lanes, bus priority lanes, and pedestrian cross walks.

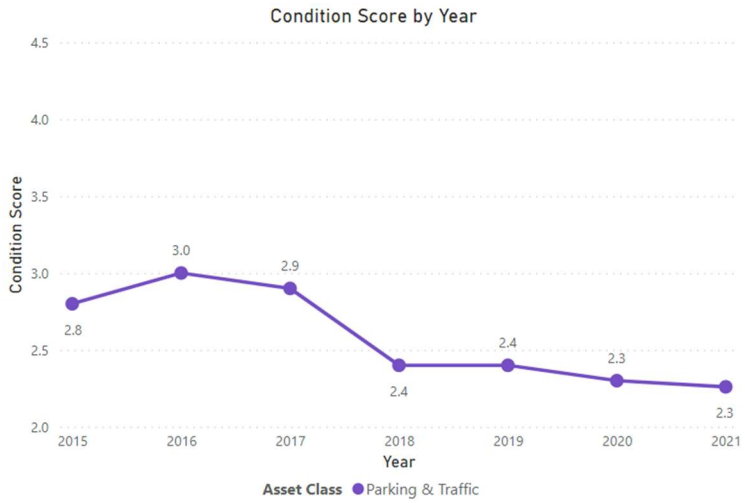
Asset Replacement Value
These assets represent 12% of all SFMTA assets

$1.85 B | All Parking & Traffic Assets
- $1.00 B | Guideway
- $393 M | Access
- $234 M | Building
- $127 M | Electrification
- $71 Revenue Collection

Weighted Condition Score
2.26 | All Parking & Traffic Assets

Backlog
$1.19 B | All Parking & Traffic Assets
- $631 M | Guideway
- $296 M | Access
- $142 M | Building
- $104 M | Electrification
- $0 | Revenue Collection





In support of the Vision Zero goal of eliminating traffic fatalities and severe injuries, the CIP includes major traffic signal upgrade projects in the Western Addition and the Tenderloin areas which will add pedestrian countdown signals, accessible pedestrian signals, and higher visibility traffic signals.

There will also be several projects using City forces that will install higher visibility traffic signals, replace key aging signal equipment such as accessible pedestrian signals and signal controller cabinets, and replace faded pedestrian crossing and street name signs.

FY23-27 Capital Improvement Program Planned Investment

Contract 36 Traffic Signal Modifications: Design and construct signal improvements at 22 intersections citywide to address safety or operational concerns. Improvements will likely include installing new pedestrian countdown signals, installing new mast-arm signals to improve visibility, or implementing left-turn signals

Contract 66 New Traffic Signals: Design and construct new traffic signals and/or flashing signal systems at up to six locations citywide. Locations TBD.

Tenderloin Signal Upgrade: Design and construct signal improvements at approximately 15-20 locations in the Tenderloin to address safety or operational concerns.

Did you know….

Key Fixed Guideway projects include substantial investment in a systematic replacement of segments of the rail system.

These projects will help to make the Fixed Guideway system more reliable, safe, and comfortable for the passengers who currently rely on fixed guideway routes.

Other Systems & Vehicles

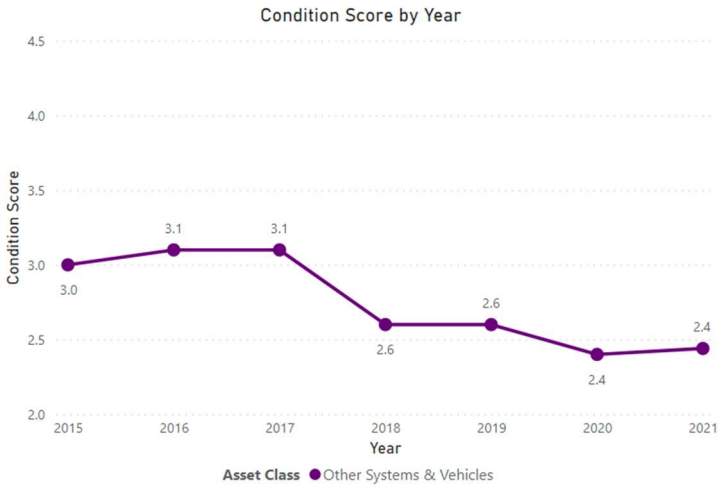
This asset class includes non-revenue vehicles, which are vital to SFMTA operations. These vehicles are used for everything ranging from roadway striping, train, bus, overhead line, track, and facilities maintenance to traffic sign and signal installation and repairs.

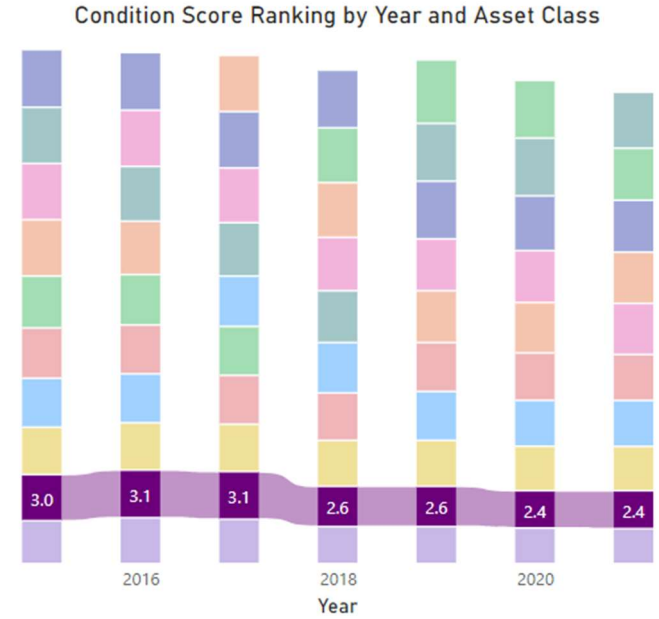
Asset Replacement Value
These assets represent less than 4% of all SFMTA assets

$595 M | Other Systems & Vehicles

Weighted Condition Score
2.44 | Other Systems & Vehicles

Backlog
$310 M | Other Systems & Vehicles
$75 M | Facilities ($65 M Equipment / $10 M Buildings)
$37 M | Vehicles ($32 M Non-Revenue / $5 M Revenue)
$198 M | Misc. Systems





The Fleet Capital Program oversees the purchase, maintenance, compliance, decommissioning, and disposal of the non-revenue fleet (including sedans, trucks, and special vehicles and equipment) to meet transit needs. Muni currently operates over 1,100 service vehicles across 75 transit lines.

Replacing these vehicles at the end of their useful lives will help reduce overall maintenance costs, improve operations response times, and reduce carbon emissions.

FY23-27 Capital Improvement Program Planned Investment

Non-Revenue Vehicle (NRV) SGR Program: Invest more than $5 Million to replace outdated non-revenue fleet that consists of light vehicles, medium and heavy trucks, and specialized vehicles and equipment that have reached the end of their useful lives.

Fleet Contingency: Funding set aside within the Fleet Capital Program, intended to accommodate unforeseen project budget increases and emerging project priorities.

Did you know…

Other vehicles or equipment that make up the non-revenue fleet: Forklifts, tow tractor pushers, trailers, scissor and man lifts, welders, compressors, generators, light bars, arrow boards, cranes, tampers, backhoes, skid steerers, and speed swings.

The most unique vehicle is a Geismar Ultrasonic Rail Fault Self-Propelled, which is driven on the rail and has sensors that send ultrasonic waves into the track.

The largest non-revenue passenger vehicles can carry up to 12 staff members.

State of Good Repair Investments

Since 2010, the SFMTA has made a commitment to spend an average $250 million per year on State of Good Repair investments.

Because the SFMTA operates in a fiscally constrained environment, the SFMTA must balance State of Good Repair needs with operations, enhancement, and expansion priorities. In 2010, the SFMTA committed to spend 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 Federal Transit Administration for the Central Subway project. This goal is intended to ensure that the SFMTA balances its resources effectively between maintaining a State of Good Repair and enhancing and expanding the transportation system.

Of the $250 million per year, the SFMTA has made it a policy priority to direct these resources primarily towards “Transit Service Critical” asset classes and projects. This spending has resulted in positive results across the asset condition scores of those assets.

In calculating yearly State of Good Repair expenditures, the SFMTA analyzes expenditures at both a project-level and Capital Program-level. Some Capital Programs such as Transit Fixed Guideway are entirely comprised of State of Good Repair investments so that 100% of that Capital Program is counted towards the SFMTA’s $250 million annual commitment. Other Capital Programs like Transit Optimization are only partly comprised of State of Good Repair projects and programmatic expenditures so that the SFMTA must consider such programs on a project-by-project basis to determine the amount of State of Good Repair expenditures. At a granular level, some individual projects may contain both State of Good Repair and non-State of Good Repair components. For example, the Van Ness Improvement Project combines the expansion and enhancement element of the added Bus Rapid Transit system with the rehabilitation of existing assets including replacement of essential utilities, namely sewer and water. The SFMTA categorized this project as an improvement and applied 70% of its spending towards State of Good Repair.

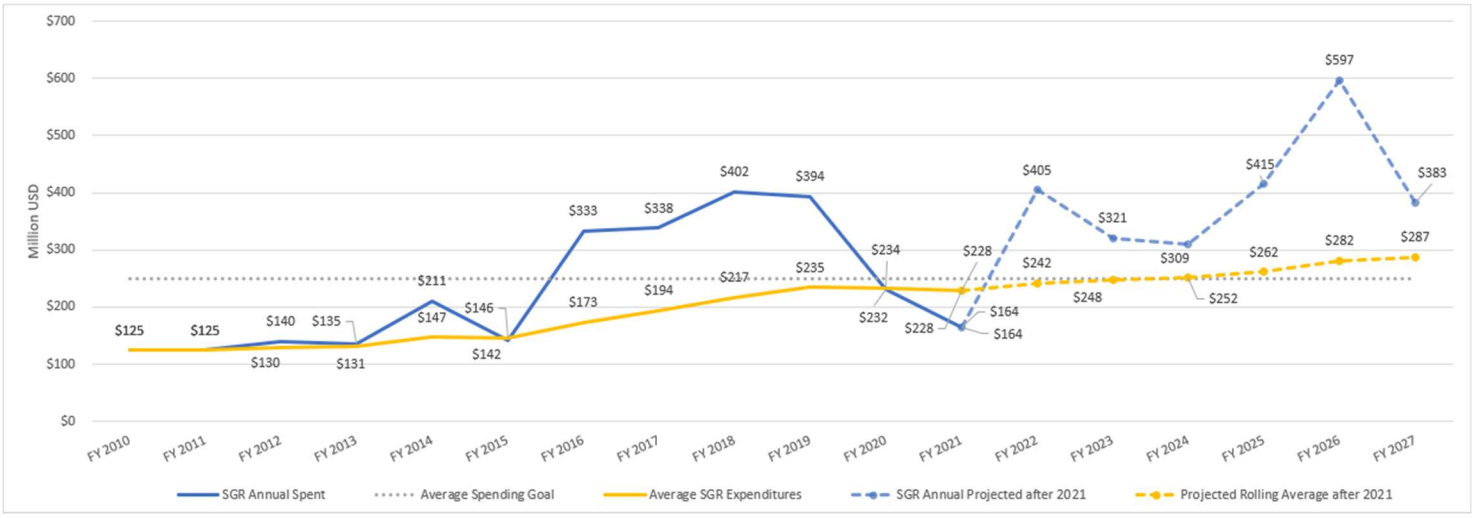
Expenditure Average:

From FY 2015 through FY2021, the SFMTA averaged $293 million per year on State of Good Repair spending.

Actual Expenditures:

The SFMTA has increased its State of Good Repair expenditures nearly every year since FY2015. In FY 2016, the total expenditures for State of Good Repair was $333 million, a 135% increase from the $141 million spent in FY2015; another significant jump was in FY2018 during which $402 million was spent on State of Good Repair, an increase of 19% from the previous year. FY2020 was a drop of 41% from FY2019. In 2021, the SFMTA spent $164 million on State of Good Repair spending which was an 29% decrease from 2020. A large part of the recent decrease in State of Good Repair expenditures is due to the difficulty caused by COVD-19 regarding finishing and closing projects. While the SFMTA is still spending a significant amount on State of Good Repair projects, the SFMTA cannot realize expenditures as part of its annual spending goal until projects have been completed. Therefore, the SFMTA expects future year spending to be higher than the final numbers from FY2020 and FY2021.

FIGURE 13: STATE OF GOOD REPAIR INVESTMENTS (FY2011-21 ACTUALS; FY2022-25 PLANNED)



2021 State of Good Repair Spending

$164M

Average State of Good Repair Spending

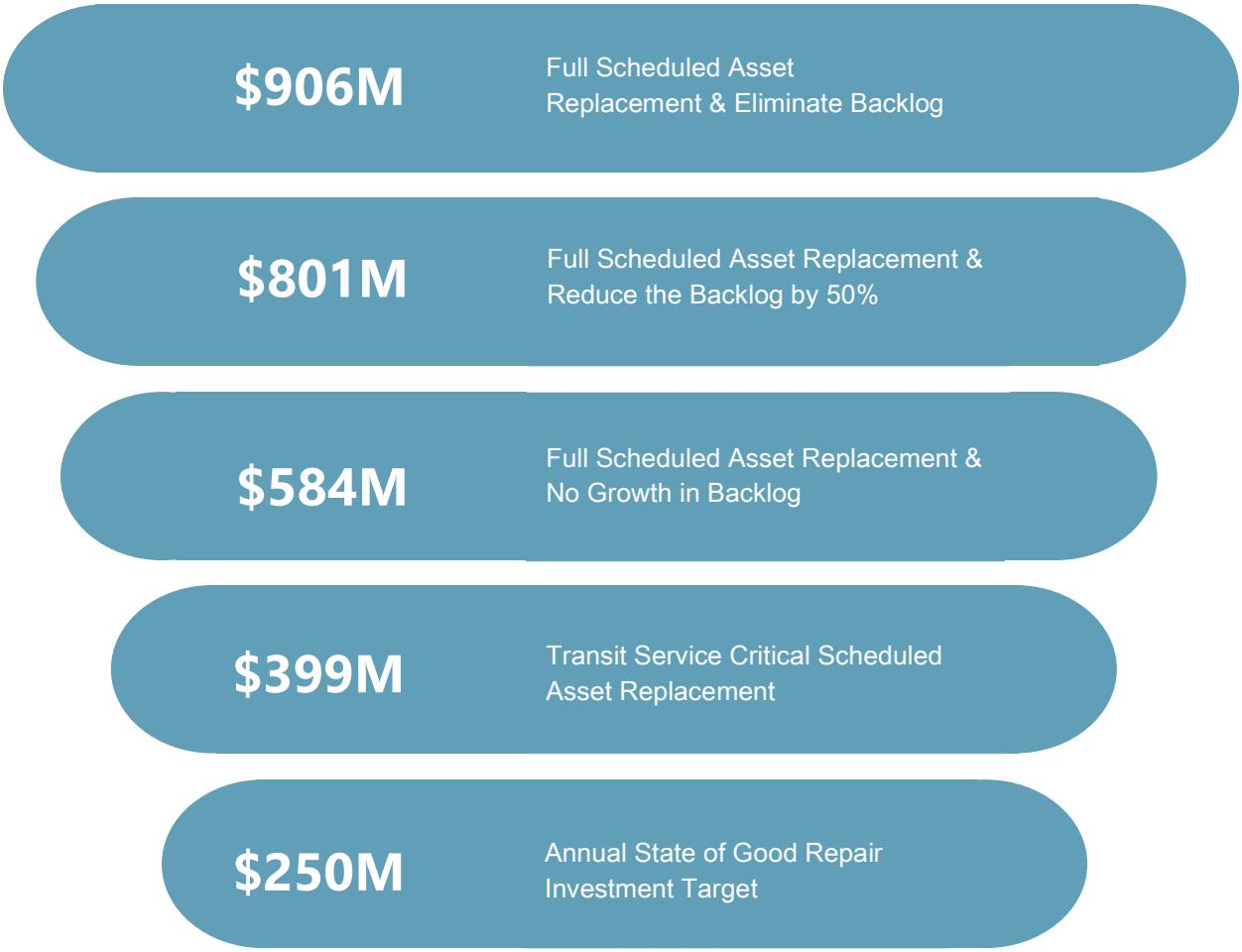
$228M

Long-Term Investment Needs

The SFMTA must continue investing in State of Good Repair at or above the current rate over the next 20 years, or aging assets will cause the reported backlog to grow.

Based on the 2021 TERM Lite analysis, it is not enough for the SFMTA to simply aim to meet its $250 million per year planned State of Good Repair investment goal. Figures 14 shows State of Good Repair annual investment levels and their impact on the reported asset backlog, including an annual 3.5% escalation. Without accounting for escalation, the SFMTA will need to invest $18.13 billion over the next 20 years to keep its assets in a State of Good Repair. In order to eliminate the entire reported asset backlog and do all needed repairs, the SFMTA would need to invest an average of $906 million per year for 20 years on State of Good Repair needs.

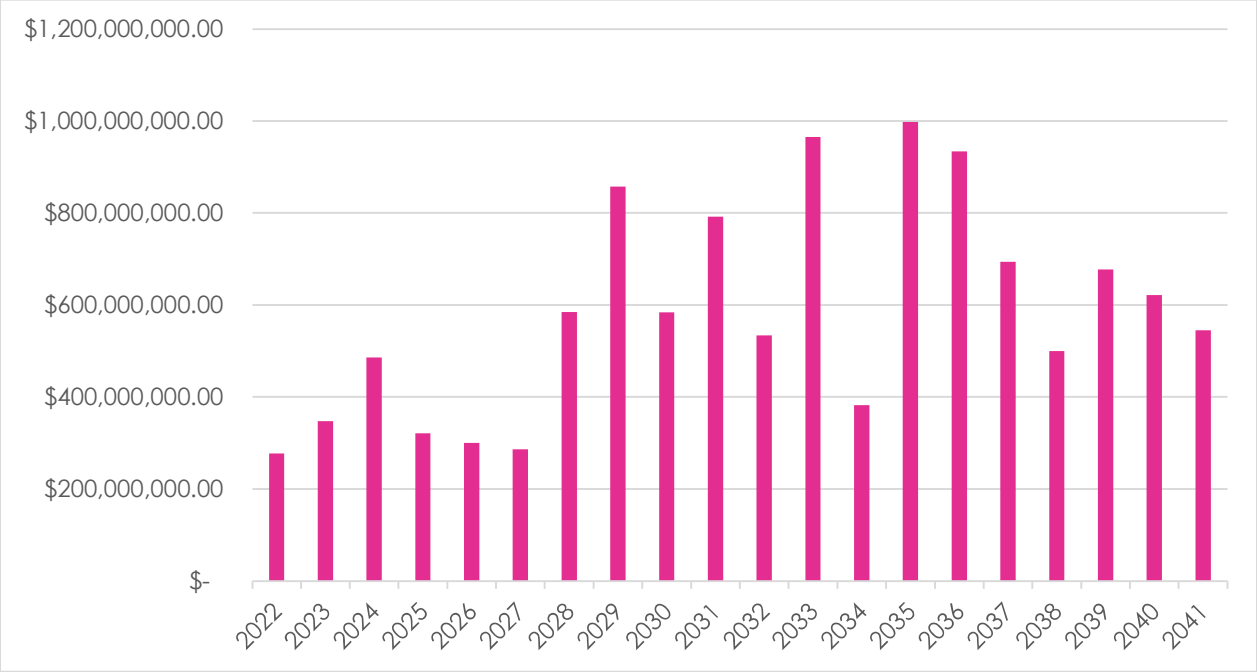
FIGURE 14: STATE OF GOOD REPAIR REQUIRED INVESTMENT LEVELS (3.5% ESCALATION)

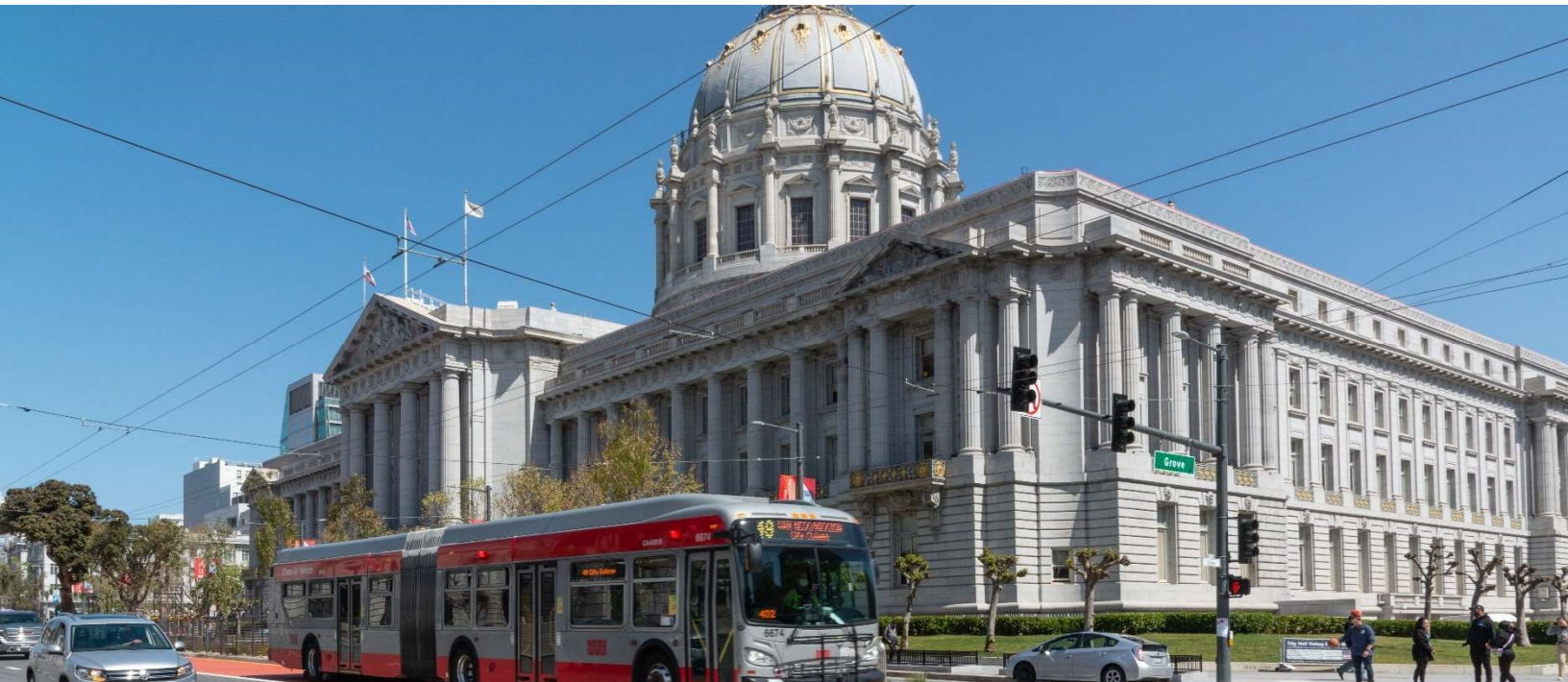


This analysis shows that the SFMTA still has significant work to do to fully meet recommended State of Good Repair investment levels over the next 20 years. However, the SFMTA's proactive State of Good Repair spending over the past few years has helped to improve the future State of Good Repair outlook.

Figure 15 shows the $11.68 billion in investment needs by year through FY2041. This excludes the existing $4.07 billion reported backlog. The model shows a relative steady rise and fall in investment need over the 20 year period. The 20 year analysis allows SFMTA to start planning projects and resources early to meet the upcoming replacement needs.

FIGURE 15: UPCOMING 20 YEAR INVESTMENT NEED





IV. Conclusions and Next Steps

Conclusion

Overall, the 2021 State of Good Repair Report reflects the SFMTA's continuous efforts to update and refine its Capital Asset Inventory, its measurements of condition of the transportation system, and process to prioritize and deliver capital improvements that will have the greatest operational impact and value to San Francisco's transportation system.

In 2021, San Francisco's transportation system is generally in a State of Good Repair, with a TERM Lite score of 3.01. Investments in transit service critical assets have resulted in the score of these assets rising since reporting began in 2014. Non-transit service critical assets, however, continue to decline in condition score and increase the overall backlog. Of particular concern, Other Systems & Vehicles and Parking assets need major investments to ensure that assets in those categories remain in a state of good repair.

The COVID-19 health emergency will have long term effects on the ability to invest in State of Good Repair projects. While the total available funding will be limited in future years, the emphasis on austerity in transportation spending will mean that new projects must demonstrate additional benefits to the overall transportation system. Projects that emphasize state of good repair and illustrate clear links to improvement in asset condition and performance will be prioritized in future capital improvement programs. As the SFMTA builds its asset management capacity, it will be in a better position to make these choices and ensure a high level of service in a heavily constrained fiscal environment.

Other Systems & Vehicles, Parking & Traffic, Track, and Stations are some of the classes with the largest backlogs and worse age based condition ratings in the whole portfolio. The SFMTA is planning major projects to address assets in these categories. However, these scores also show the necessity of condition assessments being incorporated in a holistic view of assets and asset classes. It is possible for assets to outlive their expected useful life depending on conditions, rehabilitation, and other factors. Using real condition assessments instead of just age-based scores will help inform more nuanced prioritization for assets and asset classes that are the most in need.

This report continues to emphasize a trend of insufficient investment levels to fully address the SFMTA's aging assets; the backlog increases each year and the condition trends are declining. The SFMTA has demonstrated the ability to reverse these trends in focused areas with positive results; however, the overall system continues to decline. The SFMTA can address this through prioritizing capital investments to maximize asset condition, performance and meet replacement and rehabilitation cycles. Additionally, the SFMTA can address this through operating investments, to ensure sufficient workforce capacity to inspect, monitor, and maintain the condition of its assets to meet performance standards and deliver service. As the SFMTA develops future budgets; the true lifecycle costs need to be considered when designing and implementing capital improvements, investments must address critical customer needs, and the benefits of proposed investments must measurable.

Next Steps

The SFMTA will continue to build and mature its Asset Management Program. Future activities include:

Data Refinement and PSD Migration

The Asset Management Unit will continue to refine its Capital Asset Inventory data by: adding operational condition data, continuing to develop and detail an SFMTA-wide asset hierarchy to meet additional reporting requirements, and adding data source and personnel data to assets to support the maturation of the people and processes responsible for asset management practices at the SFMTA. Additionally, migrating the Capital Asset Inventory to PSD Citywide will lead to some key advantages such as enhanced data integrity, better reporting capabilities, and ability to update the inventory in real-time.

Assessment Programs

The SFMTA still has an ongoing traffic signal condition assessment that will result in a new inventory with more accurate condition scores and operational condition data. The SFMTA also completed scoping discussions for an upcoming facilities assessment and is working on finalizing the RFP. An internal overhead line pole inventory update is in the field work stage. Finally, the SFMTA has plans to complete condition assessments of all Muni Metro stations as well as street curb and facilities assessments of Sustainable Streets related assets. All of these condition assessments will lead to a more useful and actionable capital asset inventory and will enable more accurate forecasting and prioritization.

SFMTA In-reach and Education

The Asset Management Unit will be conducting a comprehensive and sustained in-reach campaign to build asset management understanding and capacity across the SFMTA. This campaign will include making the Capital Asset Inventory easily accessible and transparent, reconvening the asset management working group, developing resources for asset maintainers and data owners, and connecting with other asset management units in other departments.

Minimum $250 Million State of Good Repair Investment

The SFMTA will continue to meet the minimum investment goal of $250 million per year in State of Good Repair needs pursuant to its commitment to the FTA. However, based on the analysis of the past few State of Good Repair reports, it is not enough for the SFMTA to simply invest in this amount per year. The SFMTA will need to reevaluate the minimum investment target moving forward, prioritize the funding of projects that support meeting the goal, and identify new sources of revenue to fund State of Good Repair projects.

2022 Transit Asset Management (TAM) Plan Follow-Up

The Asset Management Unit has been implementing the 15 Action Plans identified in the 2018 Transit Asset Management Plan. The SFMTA is starting the 2022 Transit Asset Management plan which will provide an in-depth look at the progress the SFMTA has made over the last four years and outline the upcoming strategic priorities for the SFMTA moving forward.

SFMTA

THIS REPORT WAS PREPARED BY:

Jim Morrill, Acting Asset Management Unit Manager

Phillip Lasat

Inzaley Moh