State of Good Repair 2022

San Francisco Municipal Transportation Agency

Table of Contents

List of Figures

Executive Summary

The San Francisco Municipal Transportation Agency's (SFMTA) 2022 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.

$17 Billion
capital assets maintained

$1.4 Billion
SFMTA annual budget

$393 million
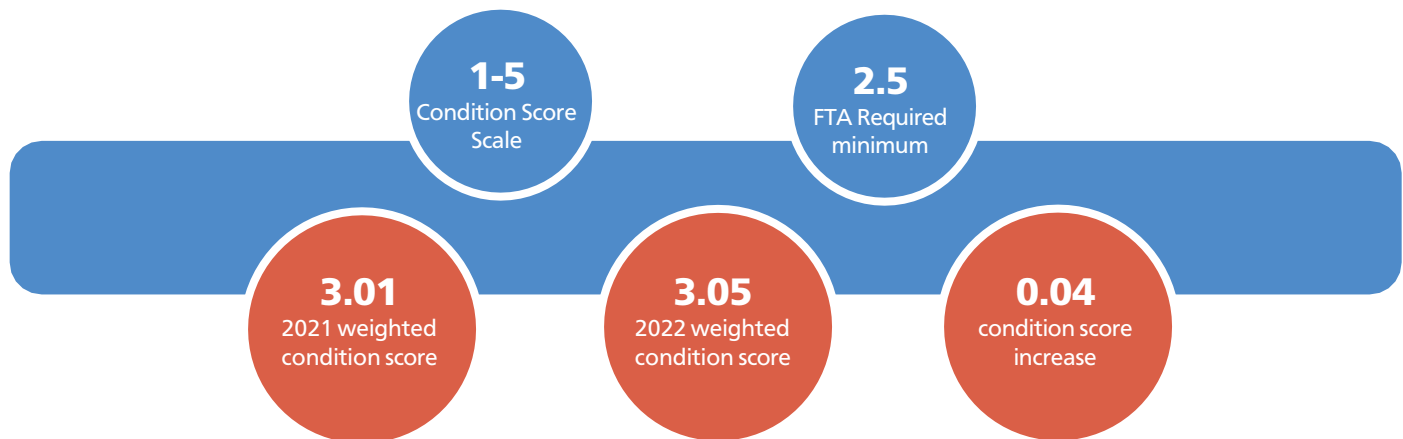State of Good Repair Investments FY21-22

Introduction

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 FY2021-2022 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 almost $17 billion of capital assets in FY2021-22 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. This figure does not include Central Subway related assets as SFMTA Asset Management staff is in the process of obtaining final report numbers of the assets. Asset replacement values increases year over year based on inflation unless further refined by the capital programs.

Asset Condition

The State of Good Repair Report provides data on the condition of the SFMTA's capital assets based on FTA condition standards. This data is known as a condition score. The FTA's Transit Economic Requirements Model Lite ("TERM Lite") calculates a condition score on a scale of 1 (poor) to 5 (excellent).

For FY2021-22, the value weighted condition score for all SFMTA assets was 3.05. 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. As the SFMTA's weighted average condition score is above 2.5, the system is considered in a State of Good Repair. Furthermore, the system's state of repair is improving. The FY2021-22 score represents an increase of 0.04 or 1.0% from the reported value of 3.01 in the 2021 State of Good Repair Report.

1-5
Condition Score Scale

2.5
FTA Required minimum

3.01
2021 weighted condition score

3.05
2022 weighted condition score

0.04
condition score increase

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.

Backlog Assessment

The total value of SFMTA's assets is $16.9 billion. Of the total assets, $3.64 billion or 29.5% of total assets are beyond their useful life. Assets beyond their useful life represent a backlog of deferred investments in infrastructure replacement or rehabilitation. Not all assets represented in the backlog require full replacement. Assets can be retired, replaced in-kind, or upgraded with new technology or systems.

The backlog is broken down into 10 asset classes: Facilities, Light Rail Vehicles, Motor Coach Vehicles, Other Systems & Vehicles, Overhead, Parking & Traffic, Stations, Track, Train Control & Communications, and Trolley Coach Vehicles. Of these 10 Asset Classes, the facilities asset class has the biggest backlog at $935 million. Facilities assets include administrative and maintenance buildings. Parking and Traffic is asset class with the second highest backlog at $699 million. Parking and Traffic assets include parking garages and traffic control devices on the streets such as traffic signals. Although, both of these asset classes are considered Non-Transit Critical, they are essential to the transportation system. For example, facilities include maintenance yards that keep SFMTA vehicles in constant working order. If those facilities get to a point of disrepair, SFMTA fleet maintenance will suffer, impacting the ability of the fleet to transport passengers.

The SFMTA has made significant progress in reducing the Parking & Traffic backlog. In 2021, the Parking & Traffic asset class had the highest backlog at 1.1 billion. This year, that figure decreased $494 million or 41.4% to $698.6 million due high levels of investment. For example, in the last three years SFMTA upgraded 60 intersections, including about 30 intersections on Van Ness Avenue. The overall Parking & Traffic inventory was reviewed and updated aided in the decrease in backlog of that asset class. Overhead lines have the third highest backlog. The backlog in Overhead lines is significant because Overhead lines is the asset class with the highest Transit Service Criticality.

While the overall condition of the Overhead lines is in the adequate range at 3.3, a number of assets that approaching the 2.5 threshold that places an asset in the backlog. Therefore, without significant

investment Overhead lines will fall from a state of good repair which means it will not be at optimal performance and will lead to less reliability, affect service and will be more costly to repair if not planned for.

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. 26% of our total assets are in 1-2 poor range, while 22% of our total assets are in 2-3 marginal condition score range. Track, Station and Overhead are top 3 with asset classes in the Marginal range. Without action, those assets will eventually fall into the poor condition range.   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.

Investment Strategies and Future Projections

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. In 2010, the SFMTA committed to the Federal Transit Agency (FTA) to invest an average of $250 million annually in State of Good Repair. In FY2021-22, the SFMTA spent $393 million on State of Good Repair. This investment brought the SFMTA's annual average investment since FY 2010 to $247 million per year which is $3 million or about 1% less than its commitment to the FTA. Although SFMTA's average State of Good Repair expenditure is slightly less than its commitment to the FTA, the commitment has increased over time. (See Figure 1)

Figure 1: Annual Spend 2010 - 2022
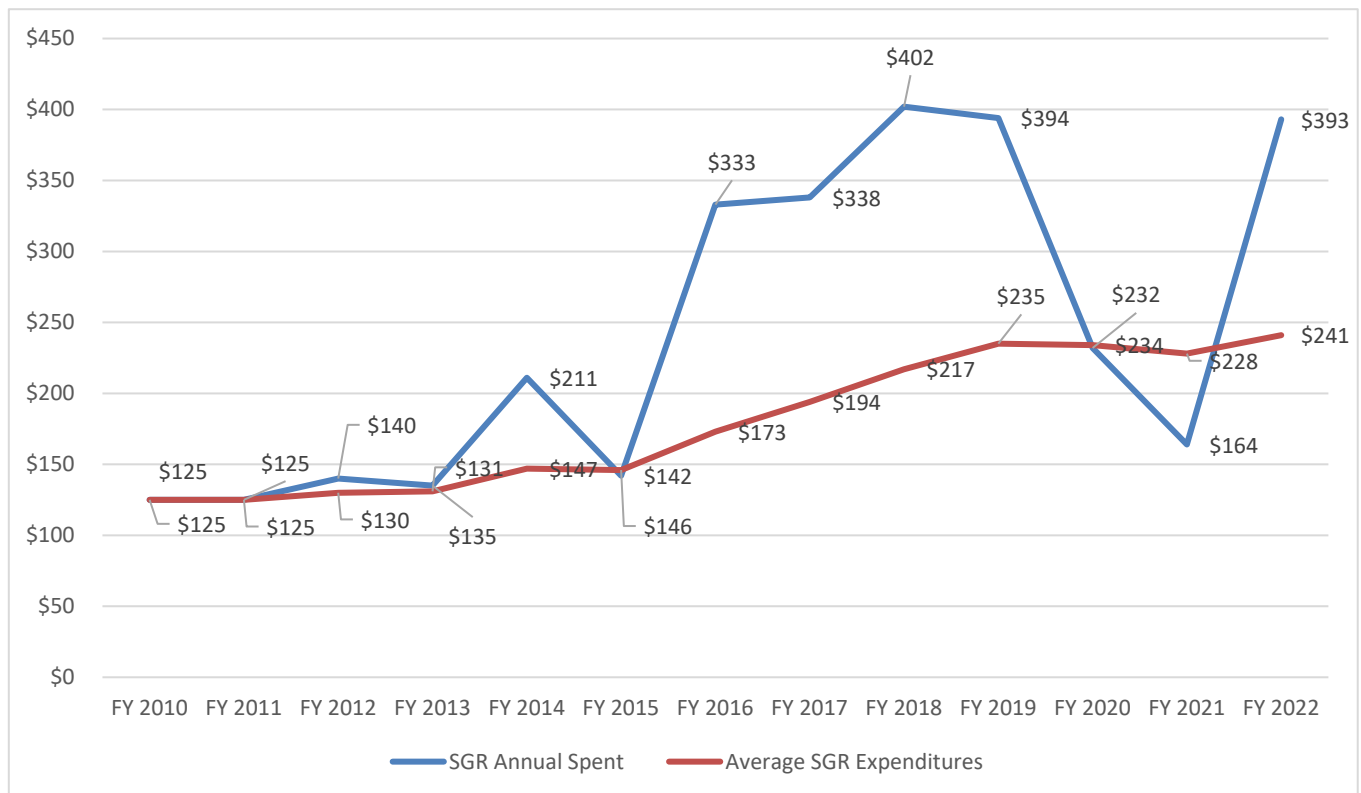
The SFMTA must continue investing in State of Good Repair at or above the current rate over the next 20 years, or aging assets will cause the reported backlog to grow. Based on the analysis in this report, it is not enough for the SFMTA to simply aim to meet its $250 million per year planned State of Good Repair investment goal. Without accounting for escalation, the SFMTA will need to invest $16.2 billion over the next 20 years to keep its assets in a State of Good Repair. To eliminate the entire reported asset backlog and do all needed repairs, the SFMTA would need to invest an average of $810 million per year for 20 years on State of Good Repair needs. In the next five years through 2029, $2.8 billion is needed for investment needs, plus the existing $3.6 billion in reported backlog. This is a total of 6.4 million to address SFMTA current backlog and upcoming replacement cycles. The upcoming FY 25-29 Capital Improvement Plan (CIP) cycle is crucial for prioritizing projects and funding.

Conclusion
The State of Good Repair reports have consistently emphasized the need for the SFMTA to increase investment and prioritization of existing infrastructure, and to improve condition assessment activities and information sharing. Since the last report, the SFMTA has made strides in asset management by continuing condition assessments, adopting a new asset management system, and progressing on investment projects. Despite these efforts, there is recognition that more needs to be done to achieve full asset management maturity and to maintain assets to meet public service expectations. The SFMTA is focused on continuing to build its asset management capacity to ensure the longevity and reliability of its transportation system.

Introduction

SFMTA Overview

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

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.

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.

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.

1st SFMTA Asset Inventory Created	1st State of Good Repair Report Issued	Asset Management Plan and Strategy Adopted	Implementation of new Asset Management Database (PSD Citywide)
2009	**2012**	**2018**	**2022**

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 2) 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 2: 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.

Asset Management Efforts 2022

In FY2022, several SFMTA asset management efforts, launched in FY2020, reached substantial completion. Most notably, the Traffic Signals Condition Assessment provided an inventory complete with location and condition data for all traffic signals in the streets of San Francisco. Also, the Asset Management Unit procured and transitioned the SFMTA Capital Asset Inventory to PSD Citywide, a state-of-the-art asset management software. The Asset Management Unit began and will continue to use PSD Citywide to maintain an accurate inventory with real-time asset additions, edits, and reporting. PSD Citywide also provides the functionality to segment out the inventory in different ways to serve all reporting needs and offer new insights on asset classes.

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.

Traffic Signals Condition Assessment provided an inventory complete with location and condition data for all traffic signals in the streets of San Francisco.
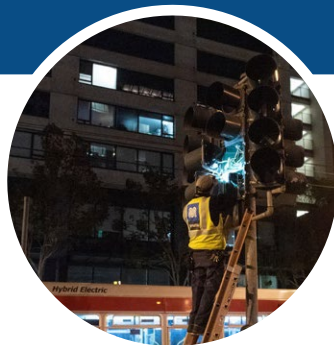
PSD Citywide helps to maintain an accurate inventory with real-time asset additions, edits, and reporting.

Asset Management Model

Figure 3 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. Asset Management Model

FIGURE 3: A COMPLETE ASSET MANAGEMENT MODEL
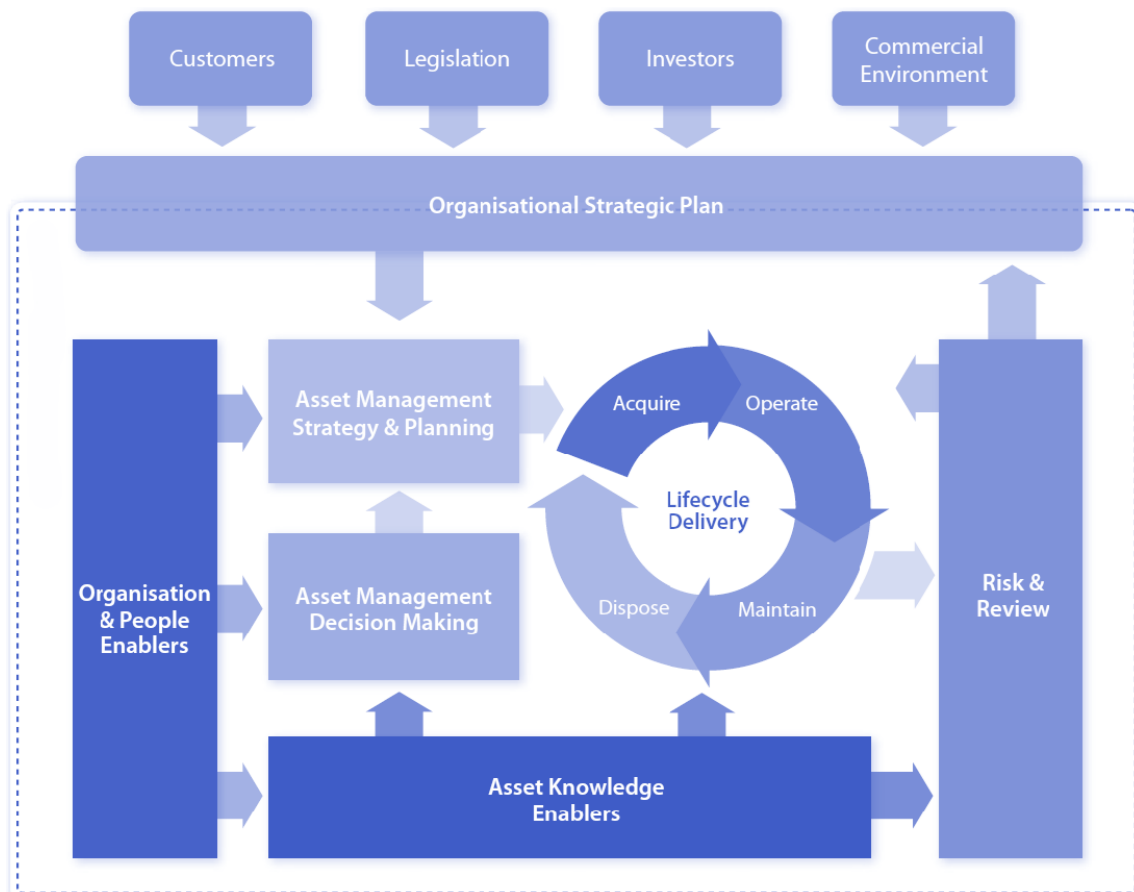
Asset Management Maturity Scale

The advancement of the Strategy is measured by the SFMTA's Asset Management Maturity scale shown in Figure 4. 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.
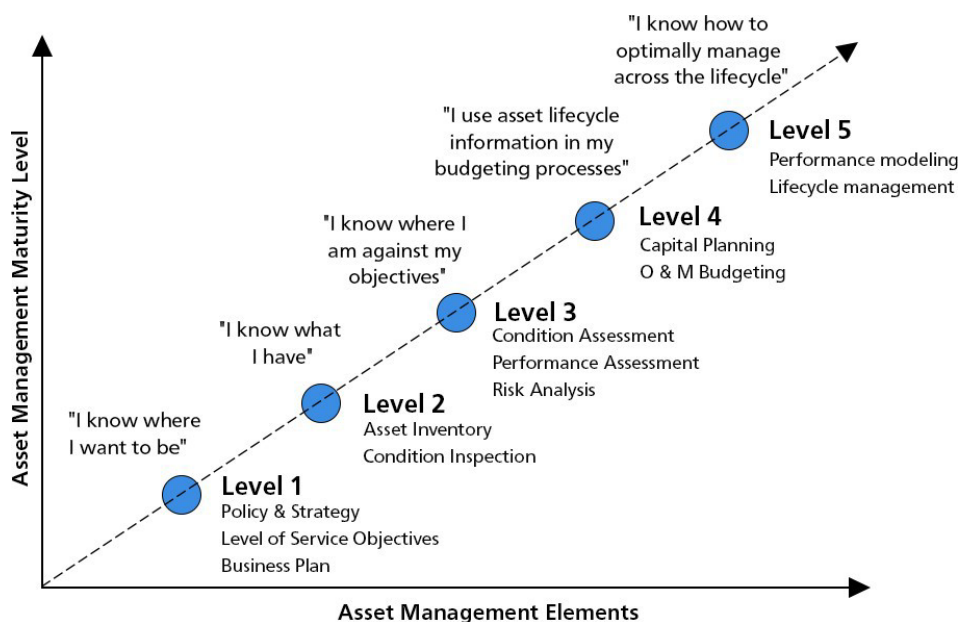
FIGURE 4: ASSET MANAGEMENT
MATURITY SCALE

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 2.5+ 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.

2022 Transit Asset Management Plan

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 the asset management program.

In July 2016, the Federal Transit Administration (FTA) published the Transit Asset Management Rule (49 CFR part 625): 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 Fall 2018, the SFMTA completed its inaugural TAM Plan which details the SFMTA's policy, approach, and implementation process to improve its asset management practices the plan's four-year duration. In Winter 2019, the SFMTA established the Asset Management Unit to implement the TAM Plan. In Spring 2022, the Asset Management Unit updated the TAM Plan, renewing its action-oriented framework aimed at improving the SFMTA's asset management maturity. The State of Good Repair Report is a key element of the Agency's TAM Plan, specifically its strategy for monitoring and evaluating progress towards strategic asset management goals. The 2022-2026 TAM Plan Strategic Goals can be found in Appendix B.

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 capital investment needs, 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 Summer 2023 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. The 2023 Capital Plan identifies over $32.3 billion in potential SFMTA capital investments over the next 20 years. The 20-year plan 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 5-Year CIP is formally updated every two years. In contrast to the 20—Year Capital Plan, SFMTA's 5-Year CIP is a financially 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.

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 PSD Citywide—an enterprise asset management software., . PSD Citywide 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. The score 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:

- Traffic Signal condition assessment
- Upcoming condition assessment 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. This year, the Asset Management Unit piloted refined, use-based condition scoring by incorporating mileage into the formulation for Non-revenue Vehicles condition scores.

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 State of Good Repair Report is completed annually and provides the SFMTA a regular interval with which to evaluate progress towards its goals and reprioritize as necessary. While the Capital Planning Process documents the SFMTA's investment decisions, this report documents the outcomes of those decisions—the health of our transportation system's infrastructure.

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 6,000 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 2022 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 5 outlines the Asset Classes as either Transit Service Critical or Other State of Good Repair.

Figure 5: Asset Classes by Transit Service Criticality

|	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, Streets, Signals	Parking Garages, Traffic Signals, Parking Meters
	Stations	Facility	Muni Metro Stations
	Other Systems / Vehicles	Communications/IT	CCTV, Non-revenue vehicles

2022 Capital Asset Inventory Update

The FY2022 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 FY2021 – as well as built upon with significant FY2022 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, track 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 2022 Capital Asset Inventory:

- Updated Farebox data
- Expanded Signals to include beacons, flashers, and radar speed signs
- Added 142 Traffic Signal Intersections, 48 intersections between 2020-22
- Updated Traffic Signals that received full upgrades
- Updated Passenger Emergency (Blue Light) Phones
- Updated 21 operator restrooms that completed refresh
- Retired 55 Breda Light Rail Vehicles from 1997-2001 and added 19 2022 Siemens and 23 2023 Simens vehicles
- Retired 33 Motorbus Vehicles from 1999 and 2007; Updated useful life and replacement cost data for Motorbus Vehicles
- Updated useful life and replacement cost data for Paratransit Vehicles
- Split out Non-Revenue Fleet into individualized assets because they have unique SFMTA Asset numbers.
- Retired Change Machines
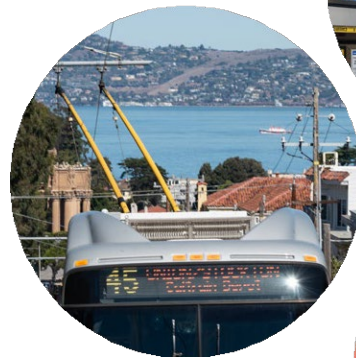
PSD Citywide

PSD Citywide is an enterprise asset management software that assists in evaluating the SFMTA's current State of Good Repair, asset backlog, future investment needs, and different funding and prioritization scenarios.

In 2021, the SFMTA procured PSD Citywide to be the new home for our Capital Asset Inventory. PSD Citywide has maintenance management and decision support functionality, empowering the SFMTA to view its assets through multiple lenses and to prioritize future investment needs. In 2022, the Asset Management Unit transitioned all SFMTA asset data to PSD Citywide, with the goal of leveraging the new tool for all strategic transit asset management analysis and reporting starting in 2023. The 2022 State of Good Repair Report is the first of these annual reports created using PSD Citywide support.

All prior State of Good Repair Reports were completed using the FTA's Transit Economic Requirements Model Lite (TERM Lite), a computer application designed to simulate transit capital investment needs over a 20-year period. The model is similar to FTA's TERM Lite Model in that it 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. Like the TERM-Lite Model, PSD Citywide can produce Asset Condition Scores, Future Investment Needs, and Asset Backlog requisite to this report. The values in this report were calculated using the same methodology as past reports, allowing for an apples-to-apples comparison of State of Good Repair across years. For future reports, the Asset Management Unit plans to improve these standard metrics with PSD Citywide's innovative tools for producing accurate condition scores, projecting asset needs, and prioritizing investments.

Condition Scores

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. As with past State of Good Repair reports, we have assessed condition using 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. It should be noted that PSD Citywide appears to have a faster rate of decay than the previous TERM Lite Models. Future research will be needed to properly document the different in parameters between the two modeling tools.

Asset Backlog

The SFMTA's reported Asset Backlog is calculated based on scheduled useful life and replacement value of an asset. 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, PSD Citywide 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.

Future Investment Needs

The FY2022 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 is important to note that 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 FY2022 State of Good Repair analysis is also based on assumptions of unconstrained spending and 3.5% inflation. Performing a simulation based on unconstrained resources provides a best-case scenario for asset replacement cycles. 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. In future reports, the Asset Management Unit plans to use PSD Citywide tools to incorporate additional scenario testing including higher or lower inflation rates, budget-based spending, and resources required to maintain specific condition scores.

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. 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 FY2022 State of Good Repair analysis calculates a total replacement value of $16.9 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.

The increase in asset replacement value for FY2022 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. Motor Coach and Light Rail Vehicles saw their replacement cost go up due to higher costs of procuring Light Rail Vehicles and the increase purchase prices of 30ft, 40 ft, and 60ft motorcoaches to hybrid and fully electric vehicles.

FIGURE 6: TOTAL REPLACEMENT
VALUE BY ASSET CLASS
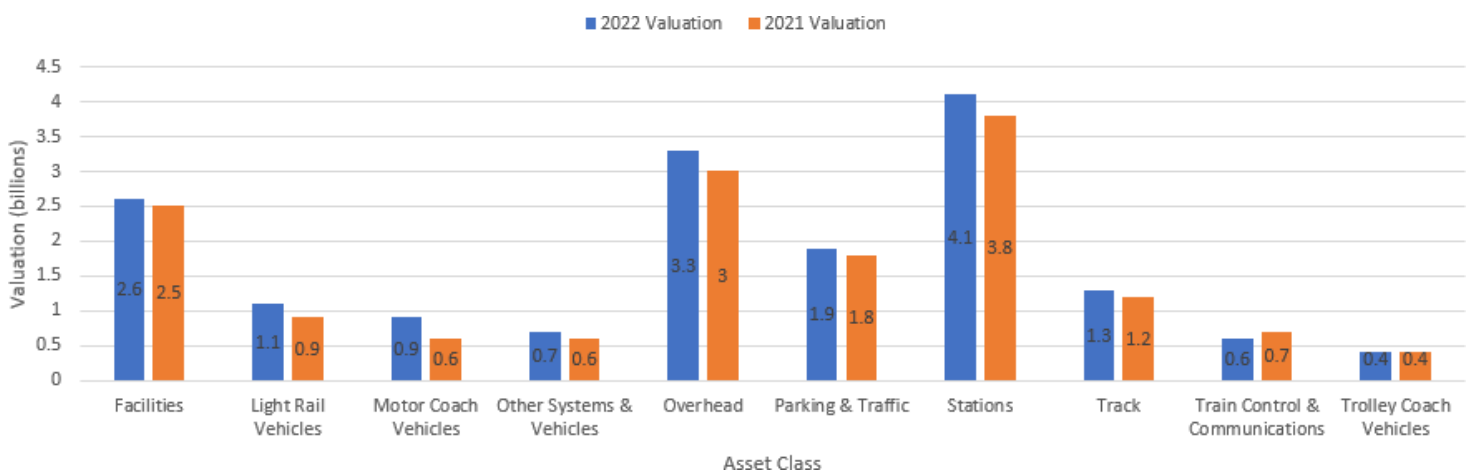
Reported Asset Backlog

The reported asset backlog is the replacement value of assets older than their estimated useful life. 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 FY2022 reported asset backlog has a total value of $3.64 billion. Figure 7 shows that the SFMTA's reported asset backlog decreased $425 million or 10% from $4.07 billion in FY2021 to $3.64 billion due to past investments made to upgrading Traffic Signals. Between 2019-2022, a total of 60 intersections received a full upgrade. Continued reductions in backlog requires continued investment in capital repair and maintenance.

The 2022 reported asset backlog is comprised of $1.28 billion in Transit Service Critical assets and $2.36 billion in Other State of Good Repair assets. The breakdown between Transit Service Critical and Other State of Good Repair assets shows the SFMTA has been focused on assets critical to providing transit service.

The decrease in the backlog was due to over 700 updates to the Traffic Signal inventory. Figure 7 shows that while Transit Critical service had been the focus, this year, Other State of Good Repair assets were improved, and the backlog reduced by 16% due to updates to the Capital Asset Inventory. While Transit Critical Service assets increased 3%, which can be attributed to increased replacement costs caused by the inflation.
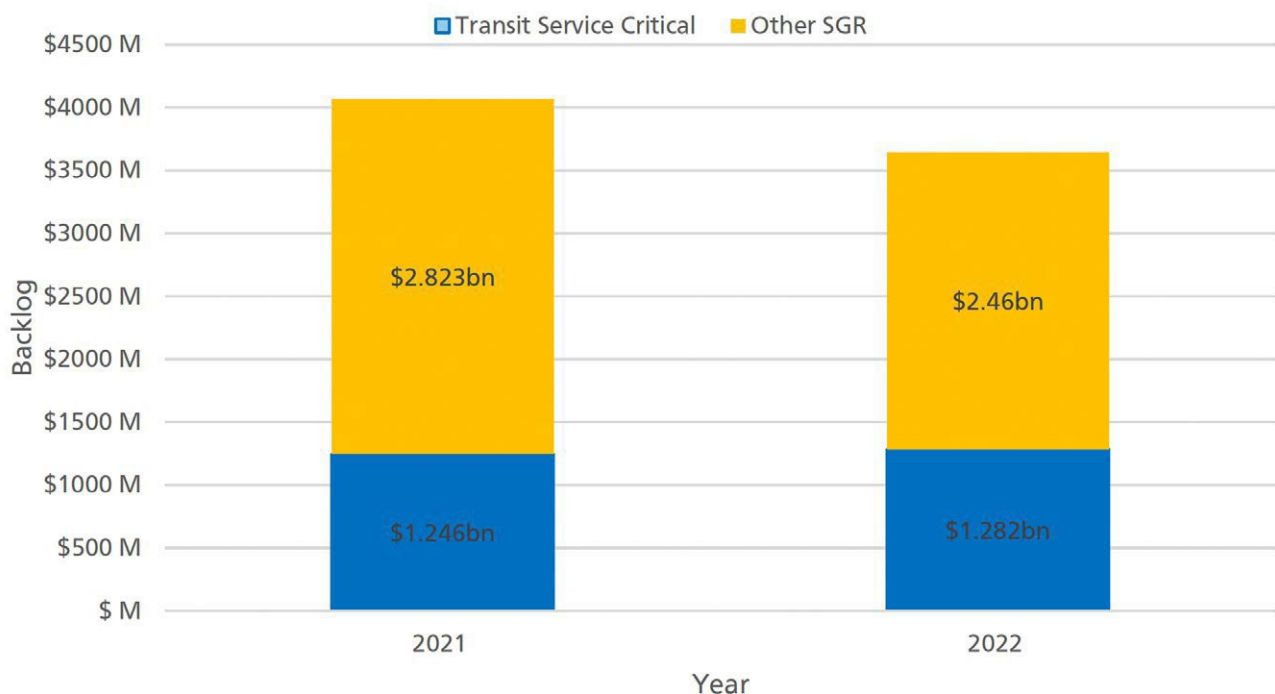
FIGURE 7: REPORTED ASSET BACKLOG

Transit Service Criticality
(millions)

Transit Service Critical   Other SOGR

Asset Class	
Facilities	935
Parking & Traffic	699
Overhead	686
Stations	680
Track	329
Other Systems & Vehicles	247 49.00
Motor Coach Vehicles	$19
Trolley Coach Vehicles	
Train Control & Communications	
Light Rail Vehicles	

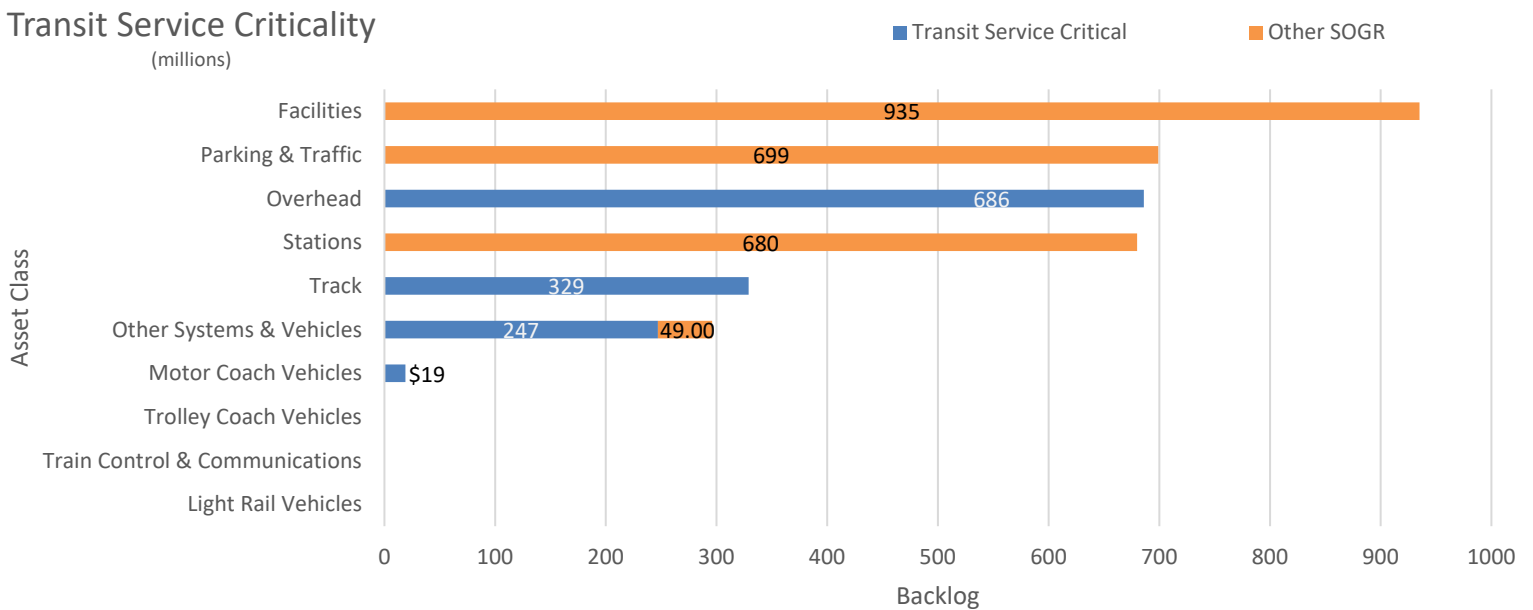Backlog: 0, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000

Figure 8, which details the reported asset backlog by asset class, shows that the SFMTA's Facility assets have the highest reported backlog at $935 million and Parking & Traffic has the second highest backlog at $699 million. Although Facilities and Parking & Traffic are not Transit Service Critical assets, failure to maintain these assets will impact degrade transit service.

As shown in Figure 8, SFMTA's fleet is in a state of good repair. Trolley, Train Control, and Light Rail Vehicles have the lowest backlogs. The good condition of these assets is consistent with the historical pattern and is due to high levels of investment made to keep SFMTA's fleet in a state of good repair, as well as regular updates to fleet plans.

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 FY2022 is 3.05. Assets with a score of 2.5 or higher are considered to be in a State of Good Repair. Therefore, overall SFMTA assets are in a State of Good Repair.

The PSD Citywide 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 PSD Citywide 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. It should be noted that level of decay on year-to-year basis in PSD city is slightly faster than the FTA's TERM Lite model.[1]

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. One example would be a light rail vehicle verses a non-revenue truck.

1-5
Condition Score Scale

3.05
2022 weighted condition score

2.5
FTA Required minimum

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[1] Level of decay on year-to-year basis in PSD city is slightly faster than the FTA's TERM Lite model. The Asset Management Unit will be working with technical support in PSD Citywide to determine the decay parameters.
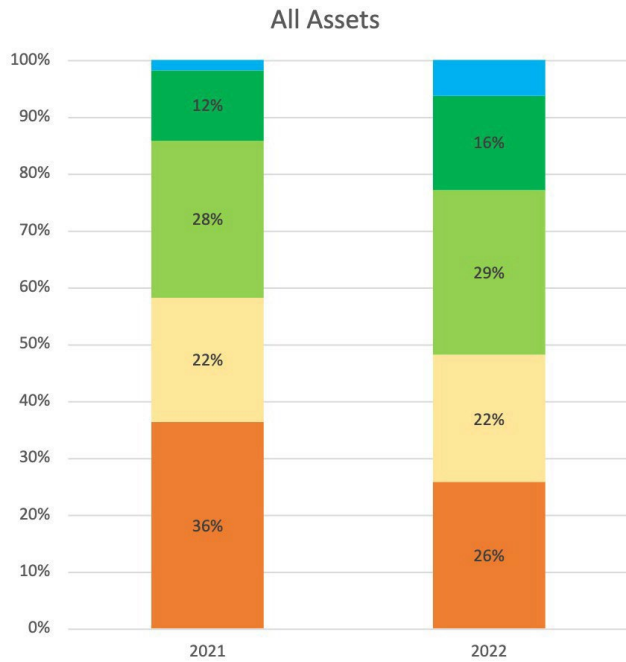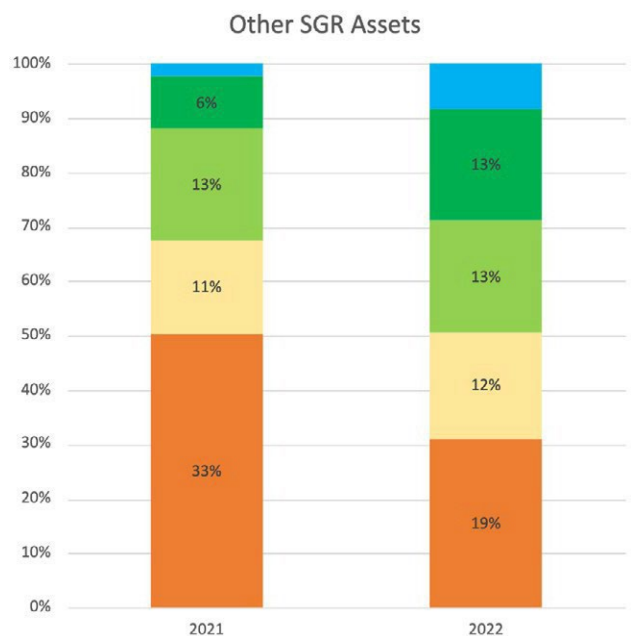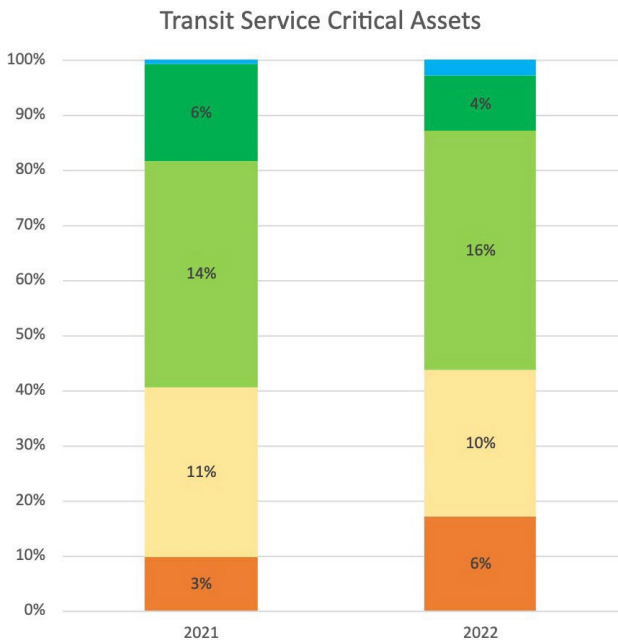
2022 Asset Condition Score

All Assets

Figure 9 displays asset condition score by Transit Service Critical (TSC) and Other State of Good Repair (OSGR) assets. Transit Service Critical assets have a substantially higher average condition score than Other State of Good Repair assets. TSC assets score a weighted 3.35 on the scale which translates to an Adequate condition category. This is an improvement of about 0.11 or 2.0% from the previous year due to replacement of some ballasted track work, emergency blue light phones, and lighting in the Twin Peaks and Muni Metro Tunnels. OSGR assets are scored at 2.73, which translates to a Marginal condition category. These scores are a direct result of a policy decision to prioritize investments in TSC assets over Other SGR assets. Despite under investment, the condition of some OSGR assets has improved; 19.0% of OSGR Assets moved from Poor condition category to improved score ranges. The improvement in condition score is primarily due to assets, such as traffic signals, being replaced and operator restrooms being refreshed.

Transit Service Critical Assets

Other SGR Assets

■ 1-2 Poor   ■ 2-3 Marginal   ■ 3-4 Adequate   ■ 4.0-4.8 Good   ■ 4.8+ Excellent

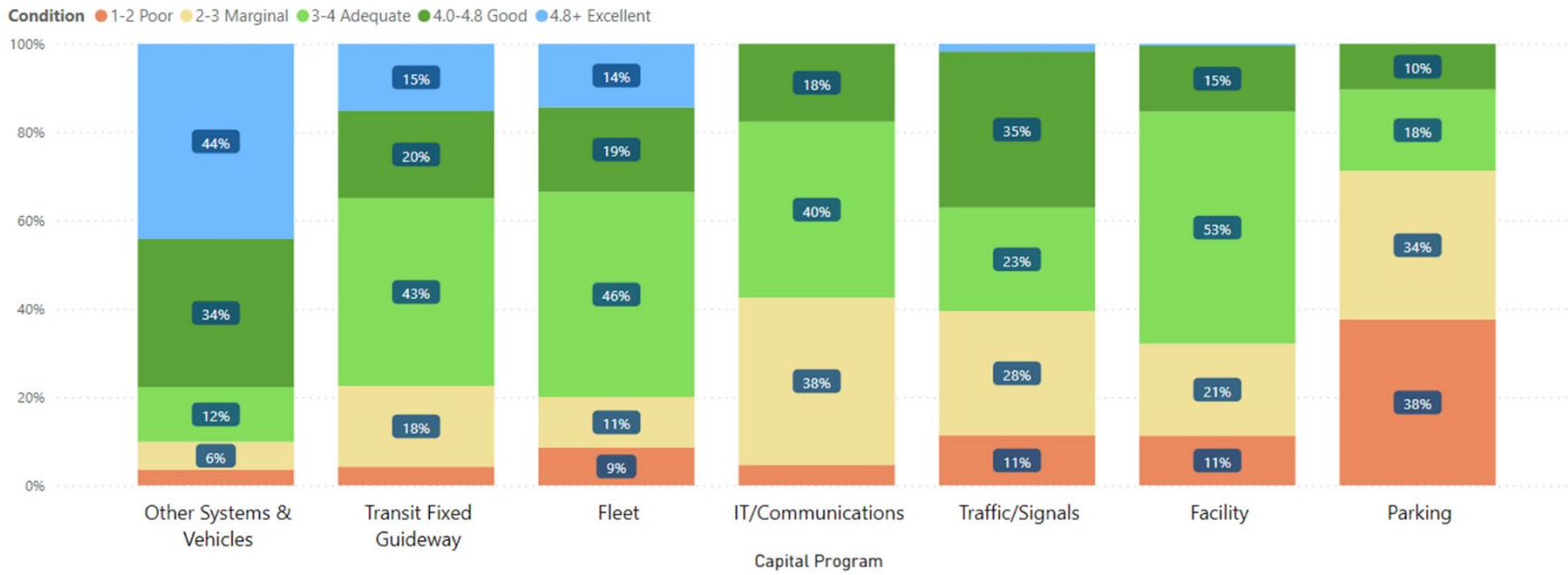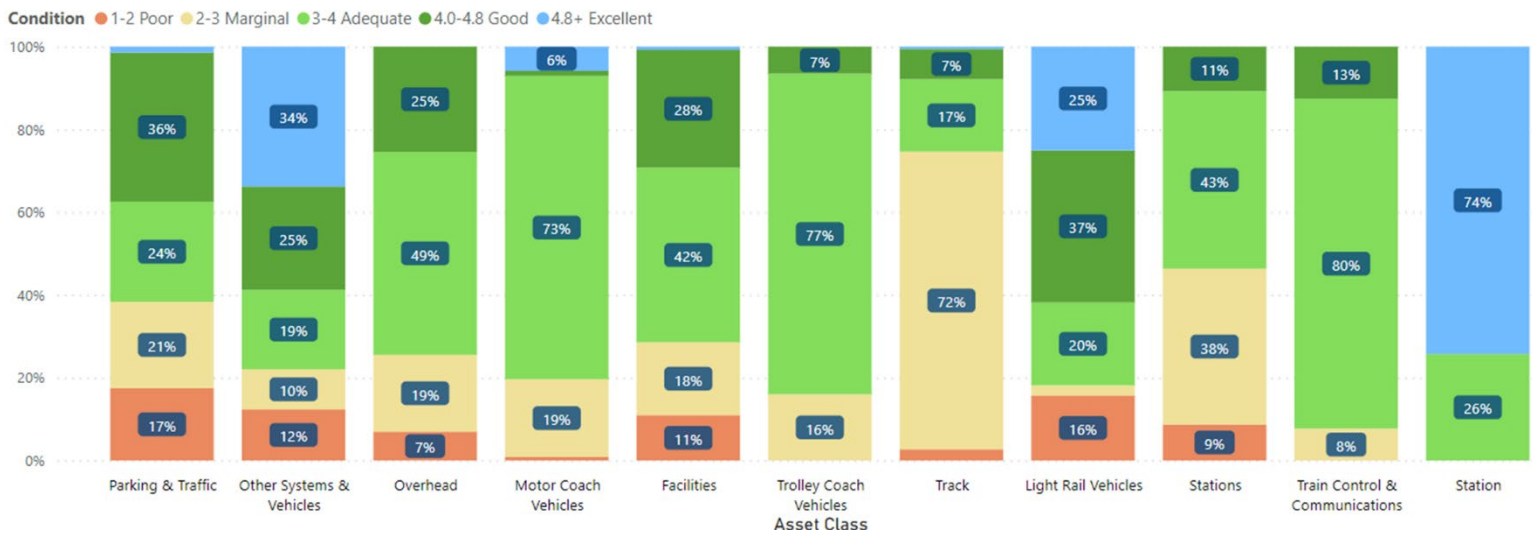FIGURE 10: AGE-BASED CONDITION SCORE BY CAPITAL PROGRAM

FIGURE 11: AGE-BASED CONDITION SCORE BY ASSET CLASS

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 improved the condition scores of Transit Service Critical assets such as the revenue fleet, but limited investment has led to lower condition scores for Parking & Traffic and Other Systems & Vehicle assets. 26% of our total assets are in 1-2 poor range, while 22% of our total assets are in 2-3 marginal condition score range. Track, Station and Overhead are top 3 with asset classes in the Marginal range. Without action, those assets will eventually fall into the poor condition range.

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 with an estimated completion of Spring 2025.

Asset Condition Score Trends

Figure 12 provides a breakdown of average condition scores by Asset Class over time. Condition score is weighed by asset value. The impact of an asset class 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.

Although, average condition scores are only based on the useful life of the assets and does not incorporate the actual operating condition of the assets, they are 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 2017 – 2022

Asset Class	2017	% change	2018	% change	2019	% change	2020	% change	2021	% change	2022	% change
Facilities	3.3	3%	3.3	0%	3.2	-3%	3	-6%	3.0	0%	2.8	-6%
Light Rail Vehicles	3.7	-3%	3.8	3%	3.8	0%	3.6	-5%	3.4	-6%	3.2	-6%
Motor Coach Vehicles	3.7	6%	3.6	-3%	3.4	-6%	3.3	-3%	3.4	2%	3.2	-5%
Other Systems & Vehicles	3.1	0%	2.6	-16%	2.6	0%	2.4	-8%	2.4	2%	2.8	15%
Overhead	3.6	-3%	3.5	-3%	3.4	-3%	3.4	0%	3.4	-1%	3.3	-1%
Parking & Traffic	2.9	-3%	2.4	-17%	2.4	0%	2.3	-4%	2.3	-2%	2.5	11%
Stations	3.1	0%	3	-3%	3	0%	2.9	-3%	2.9	0%	2.8	-3%
Track	3.2	0%	3.1	-3%	3.2	3%	3.1	-3%	3.0	-3%	2.9	-3%
Train Control & Communications	3.5	-3%	3.4	-3%	3.8	12%	3.8	0%	3.7	-3%	3.2	-13%
Trolley Coach Vehicles	3.2	-3%	3.6	13%	4.2	17%	3.8	-10%	3.4	-10%	3.5	2%

Overall, there is a gradual decline in condition across most of the asset classes except for 'other systems & vehicles, parking & traffic, and trolley.' Other systems and vehicles and Parking and Traffic has the largest increase in condition score which brought the overall weighted average higher.

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. Expanded NRV fleet to include individual vehicles which are in relit help to offset lower scores in the category.

Parking and Traffic represents the SFMTA's parking garages and traffic signals which have received less investment compared with Transit Service Critical asset classes. However, their scores improved because of updated data throughout the traffic signal inventory that include signals that were replaced but not recorded as part of past inventories.

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.
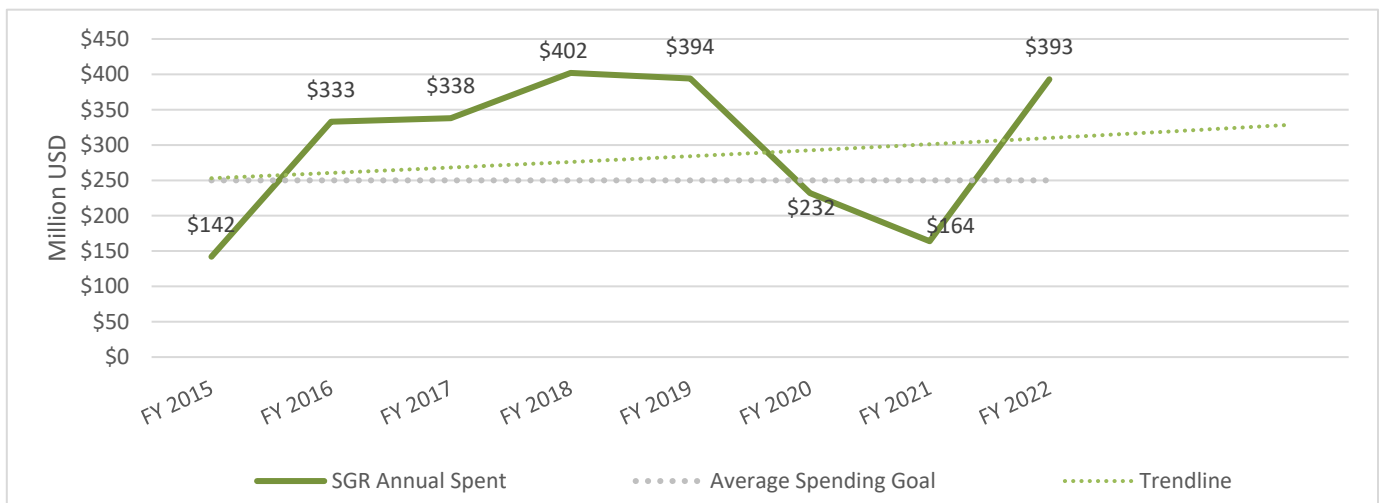
Actual Expenditures:

With the exception of the pandemic, the SFMTA has increased its State of Good Repair expenditures nearly every year since FY2015. From 2014-2018, significant investments in the replacement of the Muni Fleet, in addition to the passages of the 2014 Transportation and Road Improvement General Obligation Bond and Proposition B Transportation Population Based General Fund Set-Aside, resulted in a substantial increase of funds for State of Good Repair transportation projects. In FY 2016, the total expenditures for State of Good Repair were $333 million, a 135% increase from FY2015. Similarly, in FY 2018, total expenditures were $402 million an increase of 19% over 2017. Funding challenges due to COVID significantly decreased spending on State of Good Repair. In FY2020, expenditure was $232 million, which was 41% less than FY2019. In 2021, as the impacts of the pandemic deepened the SFMTA spent even less than 2020, expending only $164 million which was an 29% decrease from 2020. Spending recovered in in 2022, when SFMTA spent $393 million, an increase of 139% over FY2021. The increase was due to a large number of projects completing. SFMTA realizes expenditures when projects are complete.

FIGURE 13: STATE OF GOOD REPAIR INVESTMENTS (FY2011-22 ACTUALS; FY2023-27 PLANNED)
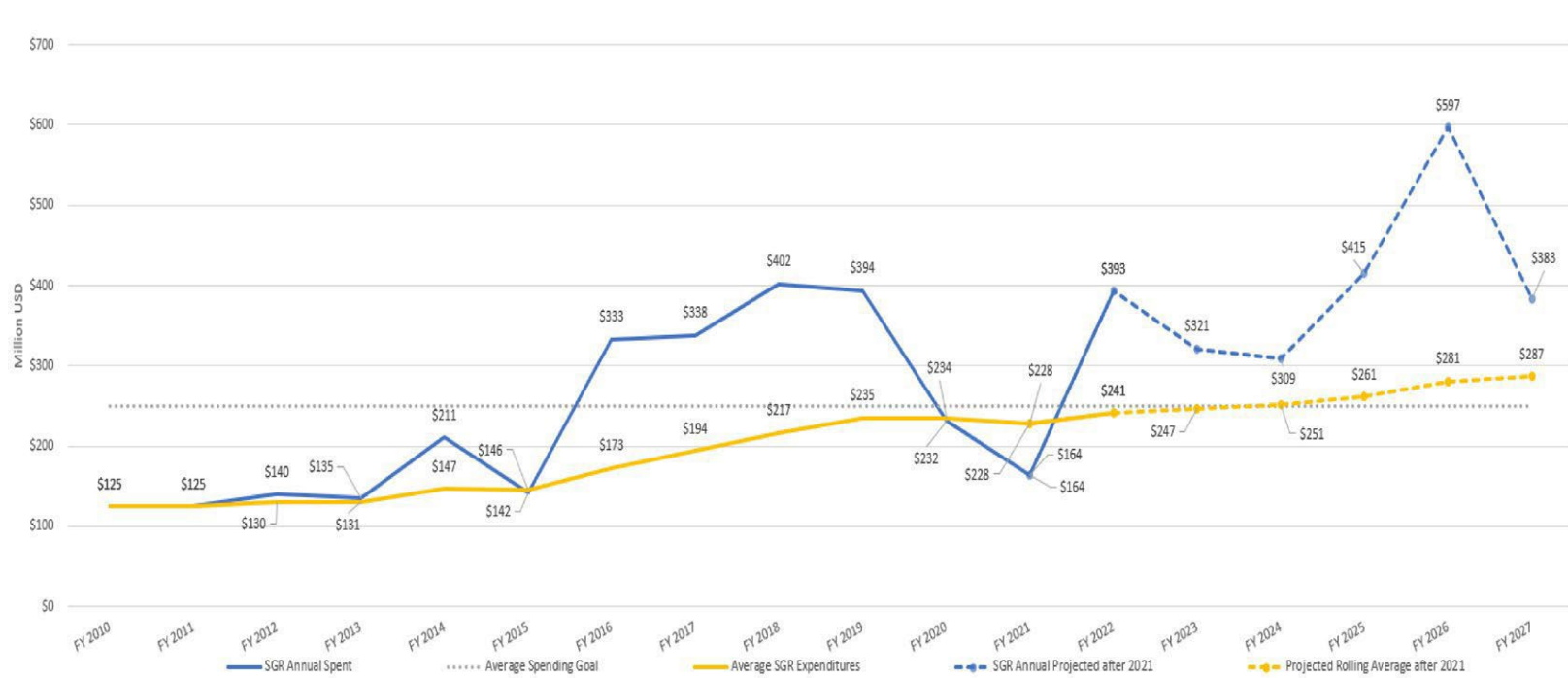
$393 Million
2022 State of Good Repair Spending

$241 Million
Average State of Good Repair Spending

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 2022 PSD Citywide 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 $16.2 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 $810 million per year for 20 years on State of Good Repair needs.

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

| Investment Level	Description
$810M/yr	Full Scheduled Asset Replacement & Eliminate Backlog
$719M/yr	Full Scheduled Asset Replacement & Reduce the Backlog by 50%
$628M/yr	Full Scheduled Asset Replacement & No Growth in Backlog
$403M/yr	Transit Service Critical Scheduled Asset Replacement
$250M/yr	Annual State of Good Repair Investment Target

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.

Over 20 years, SFMTA will need to spend $16.2 billion dollars to address the current backlog and future asset replacement needs to keep its assets in a state of good repair

Figure 15 shows the total of $2.8 billion in investment needs over next five years through 2029 plus the existing $3.6 billion reported backlog. The model shows a relative steady rise and fall in investment need over the 5-year period, but it will still take an estimated total of $6.4 billion to address SFMTA's current backlog and upcoming replacement cycles. There needs to be at least an average spending of $320 million on SGR related projects over the next 5 years just to maintain our current assets without directly addressing the backlog. With the upcoming FY25-29 CIP cycle, the 5-year and 20-year analysis can help guide SFMTA prioritize projects and funding in the immediate future and well as start planning projects and resources early to meet the upcoming replacement needs.

FIGURE 15: UPCOMING 5 YEAR
INVESTMENT NEED
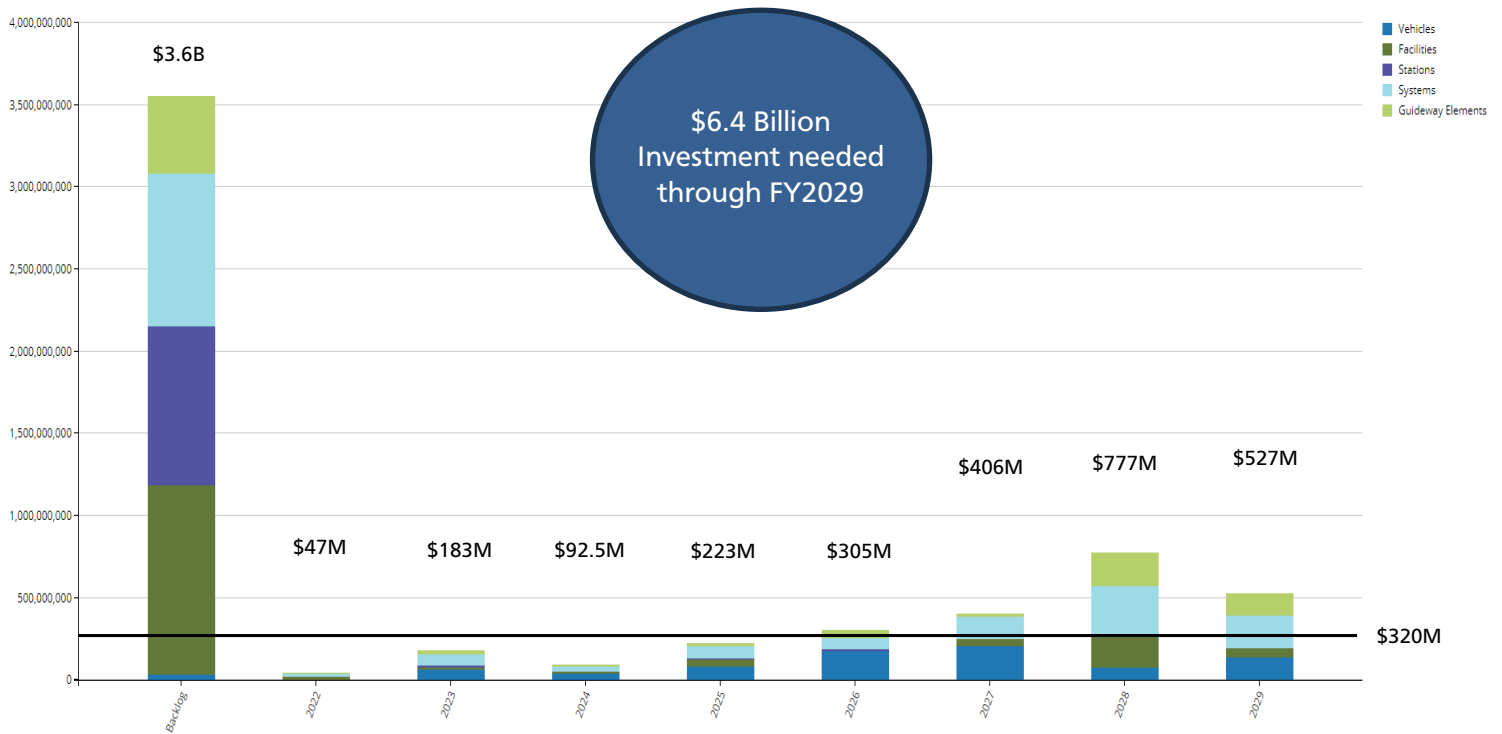
Conclusion

Conclusion

Overall, the 2022 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 2022, San Francisco's transportation system is generally in a State of Good Repair, with a PSD Citywide condition score of 3.05, which means SFMTA is currently in the adequate condition range according to the FTA. Investments in transit service critical assets have resulted in the score of these assets rising since reporting began in 2014. Due to a focus on investing in transit service critical needs, non-transit service critical assets, continue to decline in condition score and increase the overall backlog. Of particular concern, Other Systems & Vehicles and Parking assets which include parking garages and substations components, 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. The post-pandemic decline in operating revenues means SFMTA may have less ability to contribute operating dollars to maintaining capital assets. If that is the case, SFMTA will be more dependent on capital dollars provided by federal, state, and local funders who often have specific funding priorities.

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 be 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, the migration of 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 Request for Proposals. 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 is implementing the 15 Action Plans identified in the 2018 Transit Asset Management Plan. The SFMTA completed the 2022 Transit Asset Management plan in Fall 2022 and will use it to outline the upcoming strategic priorities for the SFMTA moving forward with hopes to provide progress by the next report.
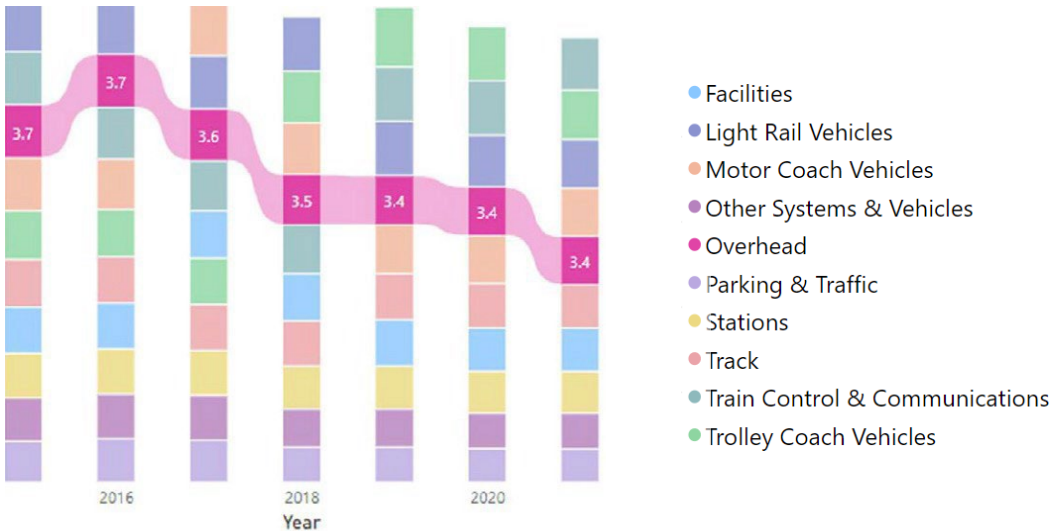
Appendix A:
Asset Class Pages

Overhead

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

20%
of all SFMTA Assets

3.3
weighted condition score

$686 M
in backlog

Condition Score Ranking by Year and Asset Class

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

Overhead lines represent 20% of all SFMTA assets and has a weighted condition score of 3.3, a 2% decrease from the prior year. Since 2015, the condition score decreased from 3.7 to 3.4. This is a gradual decrease largely due to the condition of Trolley Wire. Further analysis of the poles and foundation is needed to better understand this backlog. Of the 10 asset classes, Overhead lines ranks 3rd in terms of asset condition score amongst all asset classes.

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

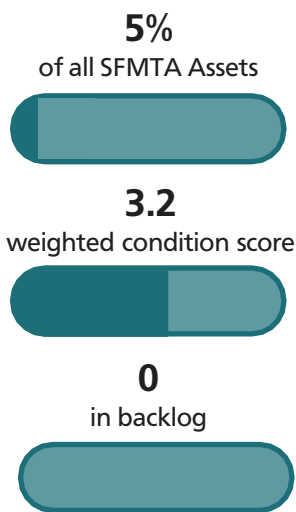## FY23-27 Capital Improvement Program Planned Investment

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.
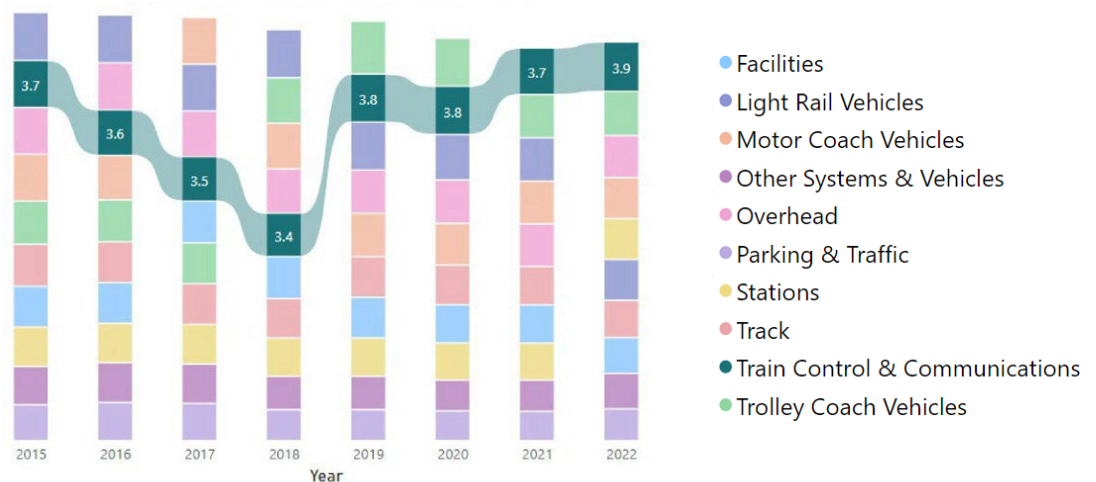
Train Control and Communications

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.

5%
of all SFMTA Assets

3.2
weighted condition score

0
in backlog

Condition Score Ranking by Year and Asset Class

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

Train Control & Communications represents 5% of all SFMTA assets and has a weighted condition score of 3.3, a 14 % decrease from the prior year. There is no backlog. Maintaining Train Control and Communication requires sufficient stock of system components, which have long-lead times for items and are extremely expensive. Replacing these components on a scheduled basis (approximately every five to ten years) will result in more timely maintenance schedules and reduce the impact on transit. The existing components currently have upwards of 15 years of service and are due to be replaced. Of the 10 asset classes, Train Control & Communications has the second highest condition score.

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.
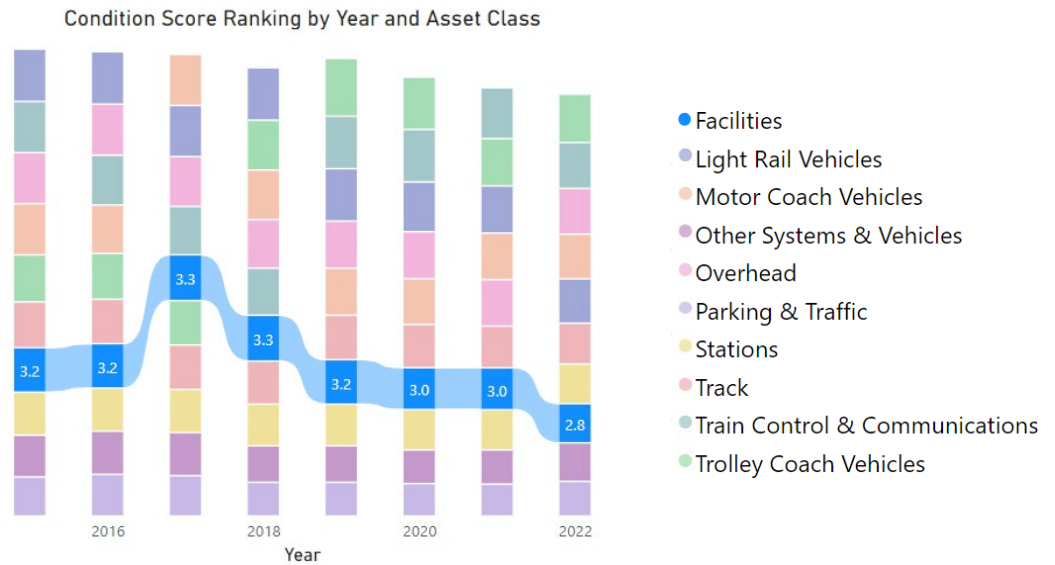
Facilities

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.

16%
of all SFMTA Assets

2.8
weighted condition score

$935 M
in backlog

Condition Score Ranking by Year and Asset Class

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

The Facilities asset class represents 16% of all SFMTA assets and has a weighted asset score of 2.8, a 5% decrease from the prior year. The lower score is due to higher deterioration rate in the new modeling tool. Facilities assets typically have high replacement values and long estimated useful lives, which means their condition score gets lower slowly overtime if investments are not made. Upcoming investments in SFMTA's oldest facilities as identified in the Building Progress facilities renewal program will raise the Facilities condition score. Of the 10 asset classes, Facilities ranks 8th in terms of asset condition score amongst all asset classes.

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:
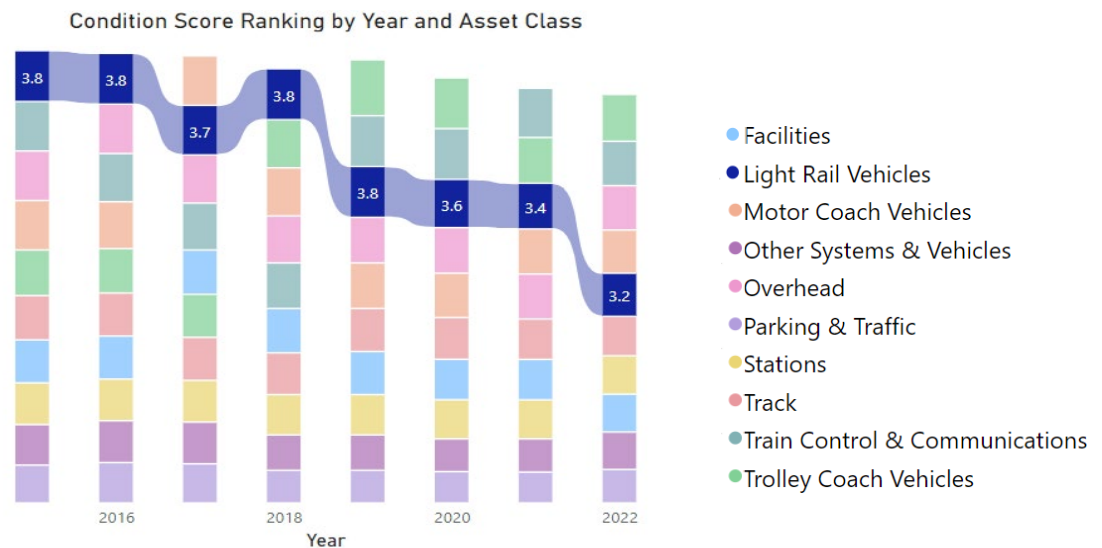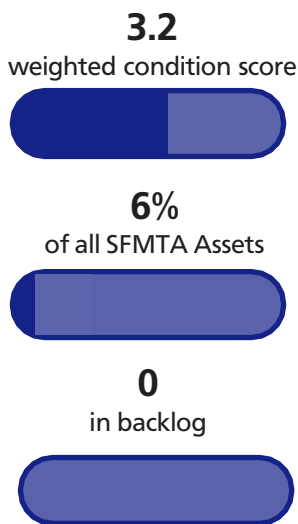
Castro Station Accessibility Improvement: Install a new four-stop elevator on the south side of Market Street at the Castro Muni Station. The project began construction in June 2023 and substantial completion is currently projected for February 2025.

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 2024.

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.

3.2
weighted condition score

6%
of all SFMTA Assets

0
in backlog

Condition Score Ranking by Year and Asset Class

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

Light Rail Vehicles represents 6% of all SFMTA assets and has a weighted condition score of 3.2, 6% decrease from the prior year. The declining condition score is due to the age of the Breda Fleet. SFMTA consistently plans for LRV replacement. As replacement vehicles arrive, this score is expected to improve. Of the 10 asset classes, Light Rail Vehicles rank 5th in terms of asset condition score.

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.
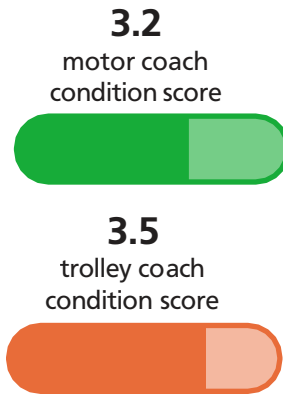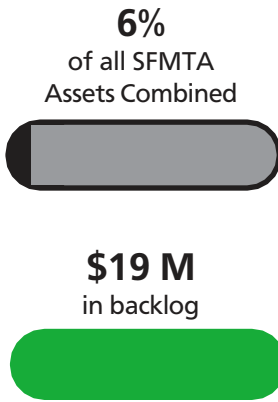
Motor Coach

The motor coach fleet consists of low emissions electric hybrid motor coaches that run on battery and renewable diesel. The fleet consists of 33 30-foot, 322 40-foot, and 224 60-foot vehicles.

Trolley Coach

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.

6%
of all SFMTA Assets Combined

3.2
motor coach condition score

$19 M
in backlog

3.5
trolley coach condition score

Condition Score Ranking by Year and Asset Class

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

Motor Coach / Trolley Fleet represents 6% of all SFMTA assets and has a weighted condition score of 3.2 and 3.5 respectively. For Motor Coach vehicles, the condition score represents a 4% decrease from the prior year. The condition of soon to be retired vehicles is the primary cause of the lower condition score. For Trolley Coach vehicles, the condition score is a 3% increase from the prior year. Updates to in-service dates was the primary cause for the increase in condition score. Of the 10 asset classes Motor Coach has the 4th highest condition score and Trolley coaches have the highest condition score.

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.

Stations

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

The Muni metro stations are over fifty years old and little is known about the condition of their comprising assets.

24%
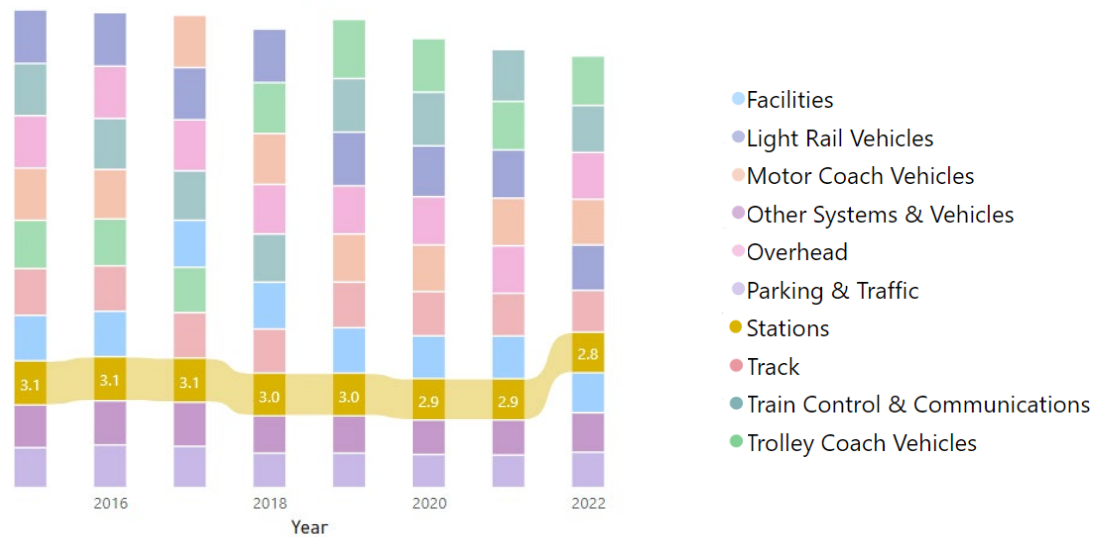of all SFMTA Assets

3.2
weighted condition score

$680 M
in backlog

Stations represents 24% of all SFMTA assets and has a weighted condition score of 2.8, a 3% decrease from the prior year. The lower score is due to higher deterioration rate in the new modeling tool and the condition of the subway stations. Of the 10 asset classes, Stations has the 7th highest asset condition score.

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 and efficiency of the transit network and preliminary design work required to implement a new rigid system.
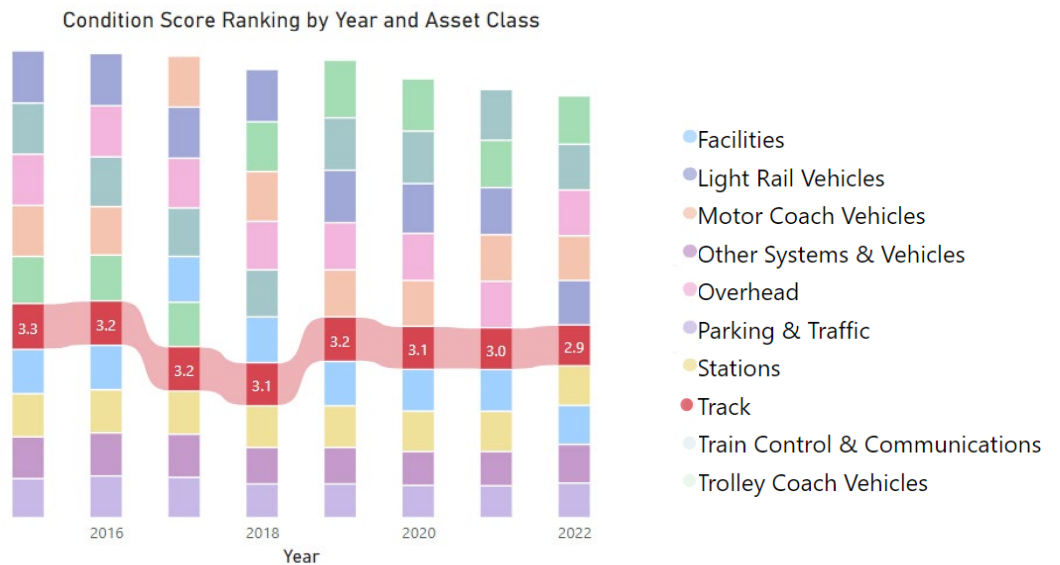
Track

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.

8%
of all SFMTA Assets

2.9
weighted condition score

$329 M
in backlog

Condition Score Ranking by Year and Asset Class

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

Tracks represents 8% of all SFMTA assets and has a weighted condition score of 2.9, a decrease of 3% from the prior year. The lower score is due to higher deterioration rate in the new modeling tool. Updates to track assets include ballasted track at the Eureka Portal, but not enough to improve overall score. Of the 10 asset classes, Track has the 6th highest asset condition score.

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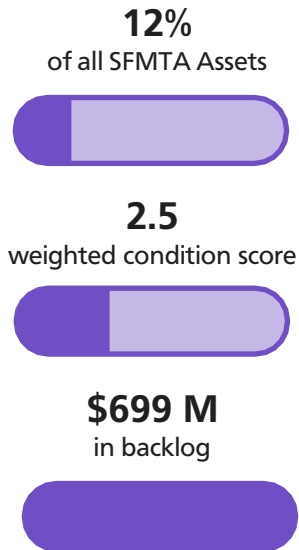
Ultrasonic Rail Testing Phase III: Conduct ultrasonic rail testing services for over nine miles trackway to evaluate and establish the condition of the SFMTA's rail network.

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.
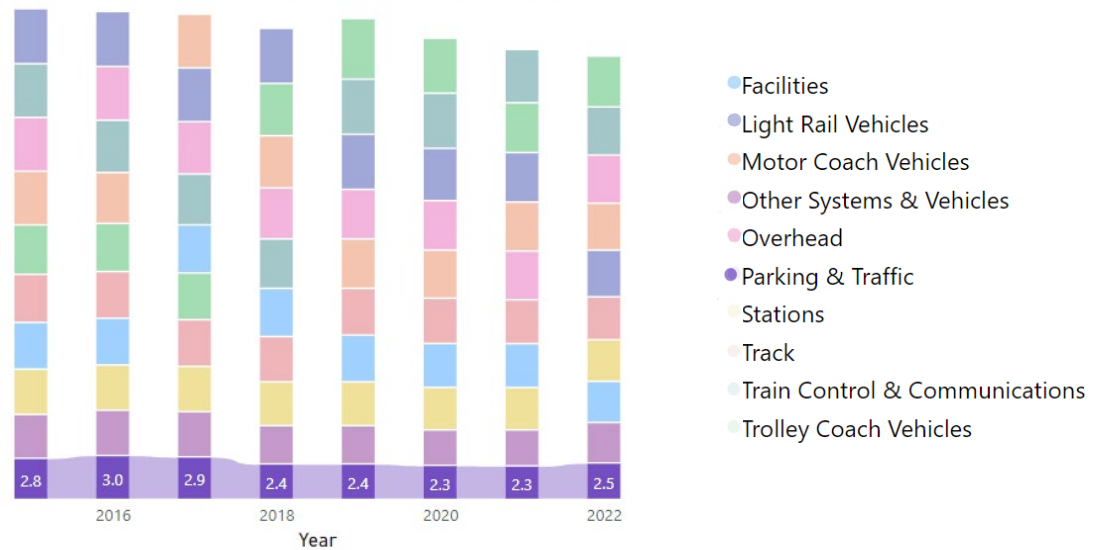
Parking/Traffic

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.

12%
of all SFMTA Assets

2.5
weighted condition score

$699 M
in backlog

Condition Score Ranking by Year and Asset Class

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

Year	Score
2016	2.8
	3.0
	2.9
2018	2.4
	2.4
2020	2.3
	2.3
2022	2.5

Parking & Traffic represents 12% of all SFMTA assets and has a weighted condition score of 2.5, an increase of 8% from the previous year. The primary driver for the increase in condition score were updates to the traffic signal inventory. There were some tangible improvements to the asset class. Between 2020-22, 48 traffic signal intersections were added, with 31 intersections along Van Ness receiving brand new signals. Of the 10 asset classes, Parking/Traffic has the lowest asset condition score.

The Parking/Traffic Capital program oversees all traffic control devices, including traffic signs, traffic striping, color curb markings, and traffic signals traffic control devices as well as overseeing On-Street Parking vendor contracts, Off-Street Parking vendor contracts, parking garage and lot operations, the EV charger program.

FY23-27 Capital Improvement Program Planned Investment

Contract 36 Traffic Signal Modifications: Design and construct signal improvements at 14 intersections citywide to address safety or operational concerns. Improvements include installing new pedestrian countdown signals, installing new mast- arm signals to improve visibility, or implementing left-turn signals. Notice to Proceed on construction contract is expected in early 2024.

Contract 66 New Traffic Signals: Design and construct new traffic signals and/or flashing signal systems at 11 intersections citywide. Locations have been determined with advertisement expected in 2024.

Tenderloin Signal Upgrade: Design and construct signal improvements at 11 intersections in the Tenderloin to address safety or operational concerns. Project under active design with a goal to advertise in 2025.
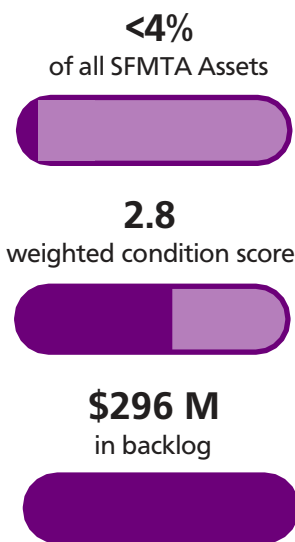
Western Addition Traffic Signals Phase 1: Design and construct signal improvements at 16 intersections in the Western Addition to address safety or operational concerns. Currently under construction with an expected completion of 2024.

Meter and signage upgrades began in February 2022 and will finish citywide by March 2025. New 5G, solar-powered meters with rechargeable batteries are replacing old ones. Multi-space meters are being modernized, while single-space meters are being replace at a pace of 800 monthly.
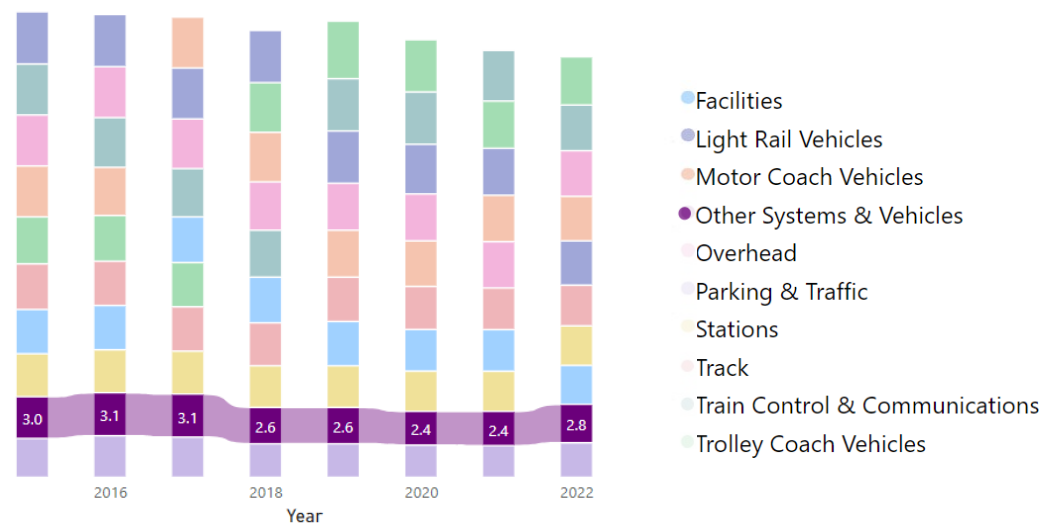
Other Systems and Vehicles

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.

<4%
of all SFMTA Assets

2.8
weighted condition score

$296 M
in backlog

Condition Score Ranking by Year and Asset Class

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

Other Systems & Vehicles represents 4% of all SFMTA assets and has a weighted condition score of 2.8, a 13% increase from the prior year. The increase was primarily due to more detailed inventory data. Of the 9 asset classes, has the second lowest asset condition score.

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.

Appendix B: 2022 TAM Strategic Goals

2022 TAM Strategic Goals

STRATEGIC GOAL	OBJECTIVE	2022-2026 GOALS
1. Condition Assessment Methods	Develop methods to improve condition assessments and other critical data by capturing the experience and knowledge of asset owners and long term staff, including crowd sources, interviews, and other methods.	1. Complete assessments for Traffic Signals and Stations. 2. Develop plan for future condition assessments prioritizing assets at risk.
2. Asset Classification Hierarchy	Develop plan on cleaning up the Asset Hierarchy into more SFMTA pertinent classifications and defining how FTA classifications fit within SFMTA assets.	1. Define SFMTA standard asset class hierarchy. 2. Tag each asset to updated asset class hierarchy. 3. Upload assets to PSD Citywide with new asset classes as well as segments needed for reporting.
3. Update Enterprise Asset Management (EAM) System	Update or replace SFMTA's PeopleSoft and TERM Lite with the capability to automate the data collection process for all major asset classes for asset inventory, condition, and performance assessments.	1. Implement EAMS at Scott Center 2. Review EAMS data and work on how to integrate into PSD Citywide 3. Develop crosswalk between EAMS and PSD Citywide
4. TAM Dashboard	Review customer feedback mechanisms and re-view opportunities to relate customer input to as-set condition where possible. Identify data access and mining needed to support this type of analysis. Develop dashboard for key TAM performance indicators.	1. Develop dashboard using PSD Citywide to provide a snapshot of performance for a particular period of time. 2. Explore if data can be aggregated so that we can see asset data related to High Injury Corridor and Social Equity Neighborhoods.
5. Link TAM Priorities to 20-year Capital Plan and 5-year Capital Improvement Program	Work with F$P to Integrate Capital Plan and Capital Improvement Program to TAM financial plan and asset inventory, condition and performance data into prioritization process for budgeting projects.	1. Incorporate TAM Plan goals into next 20 Year Capital Plan. 2. Continue using State of Good Repair Report as an input in developing the 5 Year Capital Improvement Plan

2022 TAM Strategic Goals

STRATEGIC GOAL	OBJECTIVE	2022-2026 GOALS
6. Develop Estimates of Ongoing O&M Needs and Costs	Develop estimates of ongoing maintenance needs and cost. In addition to funding rehabilitation and replacement, providing steady funding or ongoing operations and maintenance to facilitate programming.	1. Create plan to map out needed maintenance and associated costs for each asset in the Capital Asset Inventory.
7. Internal TAM Communication	Implement internal communication strategy that provides direction and promotes awareness and feedback on TAM policy, processes, and progress towards meeting goals and objectives.	1. Develop a procedure on reporting to TCC more frequently. 2. Use TCC and the fact that information and data is public facing as a springboard to initiate further engagement from staff.
8. Review Agency TAM Maturity	Measure the SFMTA's TAM maturity level over time through qualitative inputs, including performance measurement framework, decision-support tools, and staff awareness.	1. Develop plan to incorporate Asset Management Maturity Model into the different asset classes to work towards Level 5.
9. TAM Training	Identify new training needs and implement ongoing training of staff	1. Develop plan to do training refresh sessions with new staff across the SFMTA. 2. Continue Asset Management Working Group meetings.
10. PSD Citywide (NEW)	Use PSD Citywide as the new home of the Capital Asset Inventory. Use PSD Citywide functionality to segment out assets, determine asset scores, and provide an overview of the Agency's assets.	1. Upload entire Capital Asset Inventory to PSD Citywide. 2. Create a new model for asset condition score. 3. Use PSD Citywide functionality to report on data and for dashboards.

THIS REPORT WAS PREPARED BY:
Jason Chan, Asset Management Unit Lead
Talor Wald
Julianna Degelman