State of Good Repair 2023

San Francisco Municipal Transportation Agency

SFMTA

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Executive Summary

The 2023 State of Good Repair Report provides an overview of rehabilitation, replacement needs, and investments. It also outlines our project prioritization, planning, and delivery practices related to maintaining a State of Good Repair.

This is the eleventh comprehensive annual State of Good Repair Report published by the San Francisco Municipal Transportation Agency's (SFMTA) Asset Management Unit (AMU). This document builds on previous State of Good Repair Reports and provides an overview of rehabilitation, replacement needs, and investments made in SFMTA assets. It also outlines the SFMTA project prioritization, planning, and delivery practices related to maintaining a State of Good Repair. [1]

Achieving a State of Good Repair requires understanding the desired performance of an asset and investing timely to maximize performance over the useful life of the asset. As of June 30, 2023, the SFMTA owned and maintained over $19.6 billion of diverse capital assets, from motor coaches and parking garages to street signs and paint. This figure includes Central Subway-related assets.

Condition Score

The State of Good Repair Report provides scores on the condition of the SFMTA's capital assets based on Federal Transit Agency (FTA) condition standards. SFMTA uses an asset management software called PSD Citywide (PSD) [2] to store asset data and calculate a condition score on a scale of 1 (poor) to 5 (excellent). The scale was developed by the FTA and is detailed in Table 1: FTA Transit Economic Requirements Model (TERM) Scale. SFMTA scoring criteria are mostly based on the age of the asset. Factors such as condition assessments, specific operating conditions, and level of use are utilized if data is available. For example, parking garages had a condition assessment performed in 2013, affecting the scores for parking garages.

Table 1: FTA Transit Economic Requirements Model (TERM) Scale

Rating	Condition	Description
5	Excellent	No visible defects, new or near new condition, may still be under warranty if applicable
4	Good	Good condition, but no longer new, may be slightly defective or deteriorated, but is overall functional
3	Adequate	Moderately deteriorated or defective; but has not exceeded useful life
2	Marginal	Defective or deteriorated in need of replacement; exceeded useful life
1	Poor	Critically damaged or in need of immediate repair; well past useful life

1 Details regarding the SFMTA's asset management practices are in Appendix A.
2 More information regarding PSD Citywide is in Appendix B

The FTA recognizes a transportation system as being in a State of Good Repair if the system has an average score of at least 2.5. For FY2022-23, the value-weighted condition score for all SFMTA assets is 3.02, meaning the SFMTA system is in a State of Good Repair. The SFMTA calculates an average condition score of the agency's assets, weighted by asset replacement cost. This means the more valuable the asset, the more impact it has on the overall condition score. Overall, the system's average condition score is similar to previous years, though a decrease of 0.03, or 1.0%, from the FY2021-22 reported value of 3.05. This change is due to the natural aging of assets and limited asset replacement.

Although the agency-wide condition score shows little year-over year variation, there is significant variation in the state of good repair within asset classes. An asset class is a way to categorize assets.

The SFMTA's ten asset classes are:

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

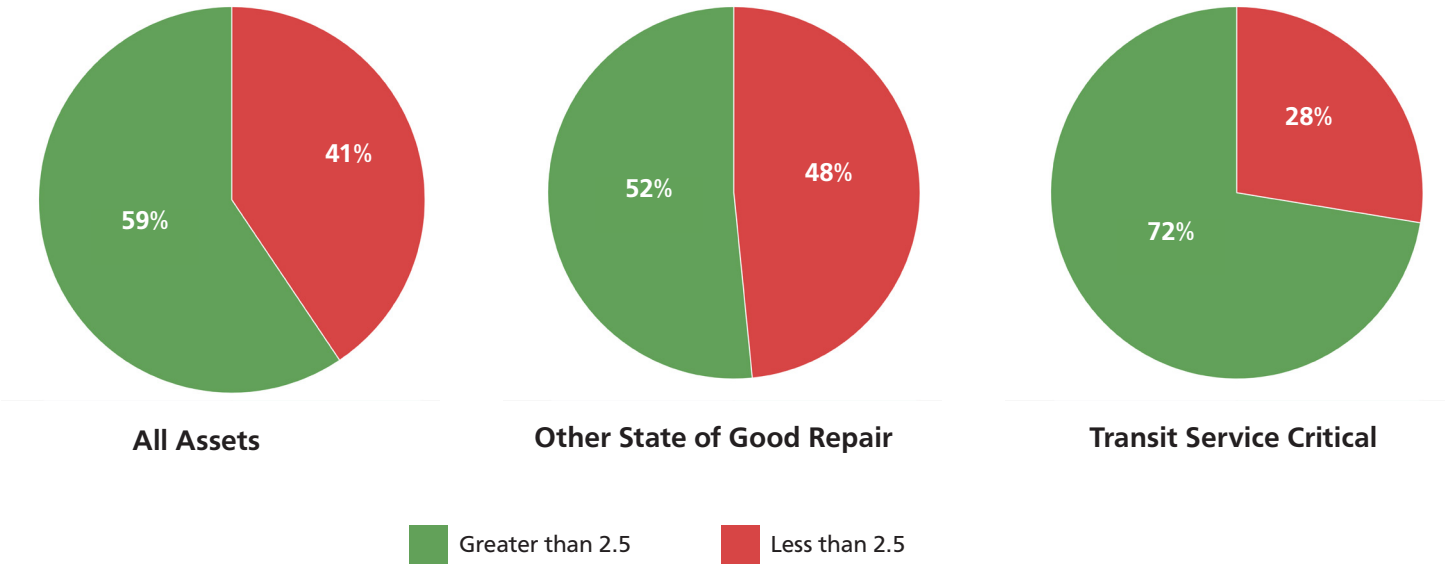
The SFMTA further categorizes Asset Classes into two categories:

- **Transit Service Critical (TSC):** Assets that are essential to keep the transportation system moving and reliable, like Light Rail Vehicles, Overhead Lines, and Track.

- **Other State of Good Repair (OSGR)**: Assets that are not critical to a working transportation system though they may still be important, such as Facilities, Parking Garages, and Non-Revenue Vehicles.

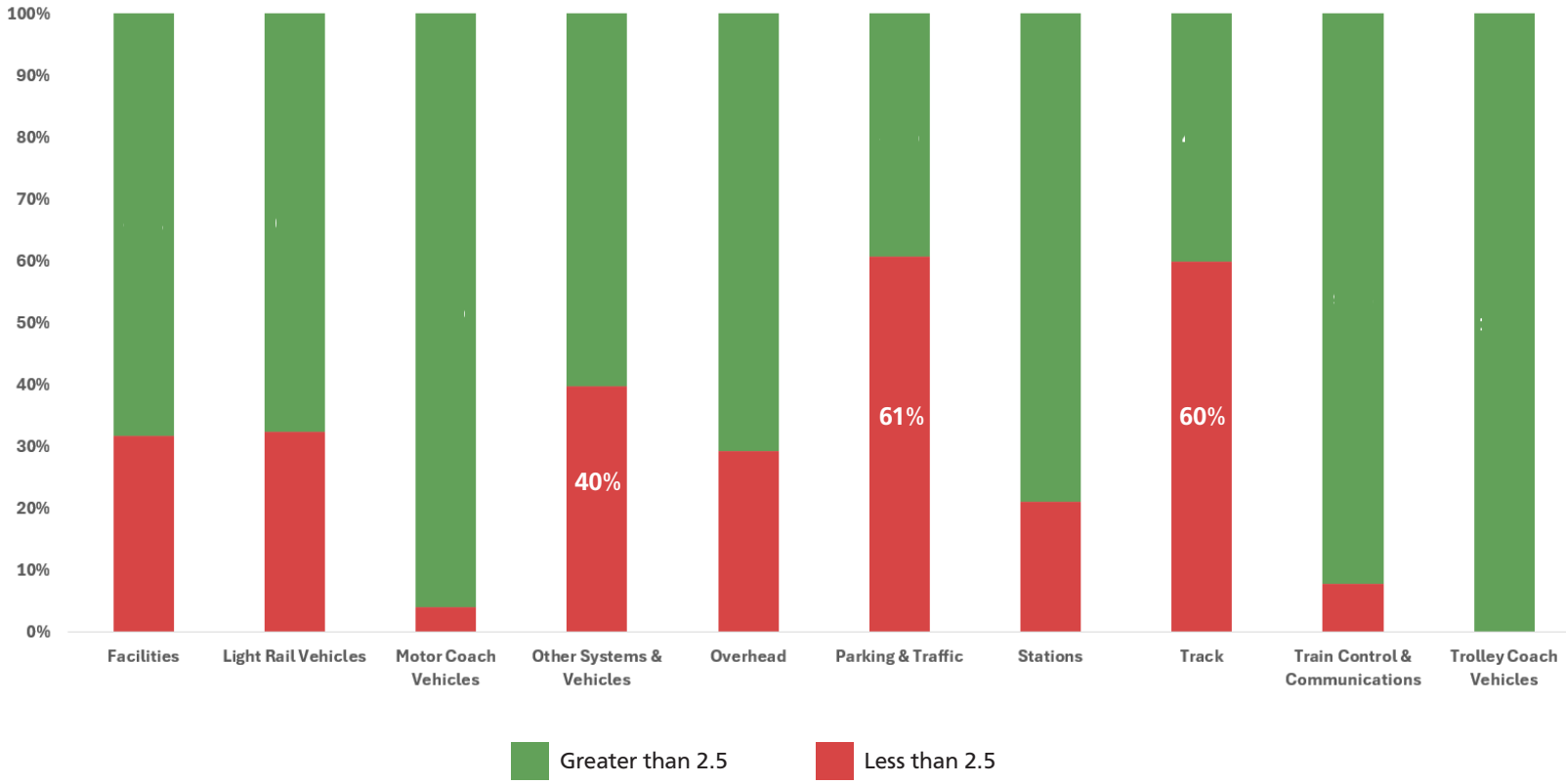
TSC assets have a substantially higher value-weighted average condition score than OSGR assets at 3.2 and 2.6 respectively. OSGR assets are in a worse state of repair due to a lack of available funding to maintain OSGR assets.

FIGURE 1: AGE BASED CONDITION SCORE ACROSS ALL ASSETS BY TRANSIT CRITICALITY



The Age-Based Condition score across all assets by Transit Criticality, shown in Figure 1, shows that 59% of all assets are considered in a state of good repair with scores over 2.5. In terms of Transit Service Critical assets, 72% of transit service critical assets are in a state of good repair with scores over 2.5. This shows SFMTA's continued investment in keeping the assets most critical to the transportation system in good shape. SFMTA proactively performs maintenance activities such as quarterly Fix-It weeks to maintain assets in good condition. However, the size and age of the system, as well as its near-constant operation make maintenance challenging.

FIGURE 2: STATE OF GOOD REPAIR BY ASSET CLASS



Across the asset classes, as shown in Figure 2, Other Systems & Vehicles, Parking & Traffic, and Track have the greatest percentage of assets not in a state of good repair. The Twin Peaks Tunnel shutdown performed in the Summer 2024 was a significant maintenance effort that will have positive impact on the Track condition score in future reports as well as the completion of the L-Taraval line. Yet investments in transit service critical assets should continue to be focused within these asset classes.

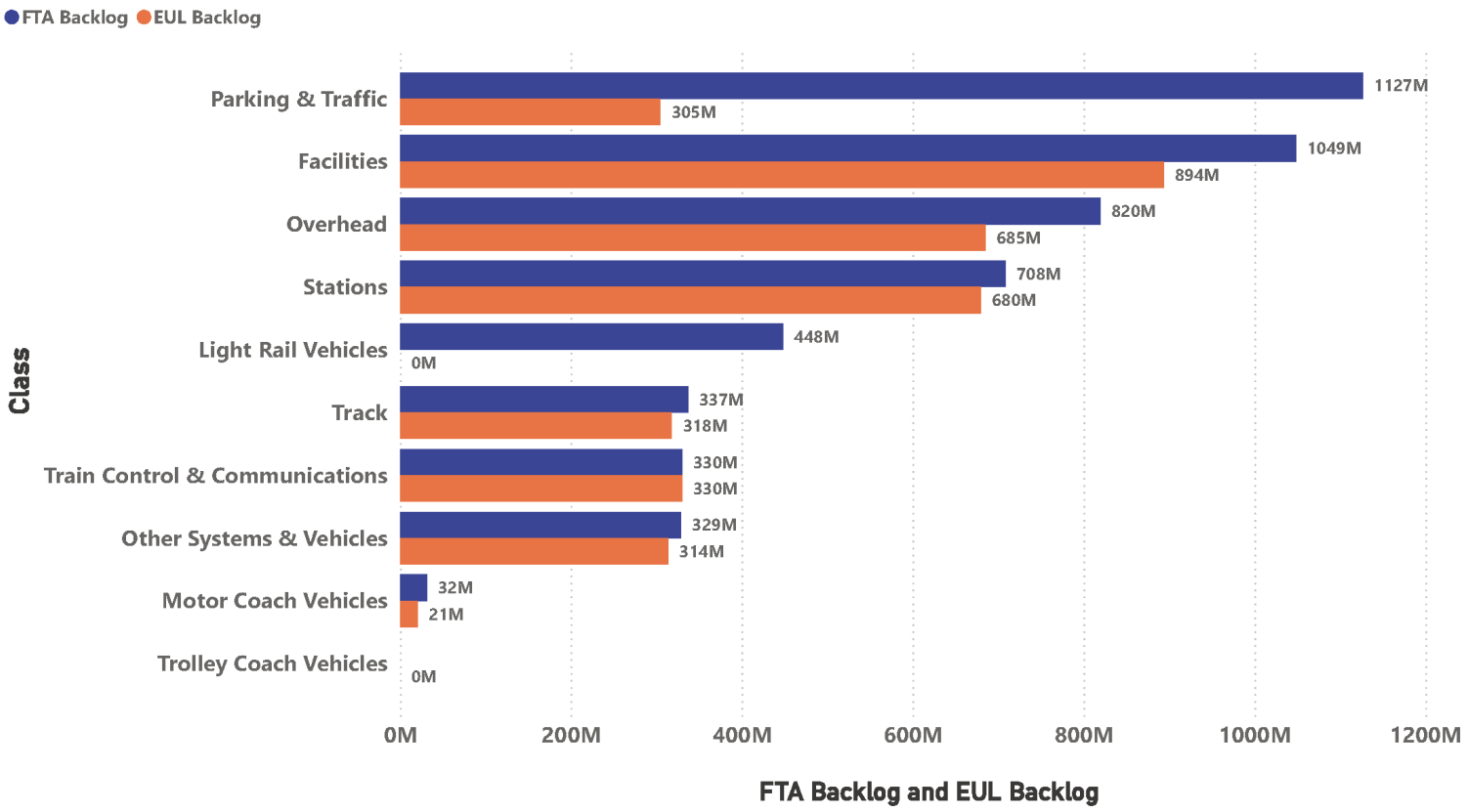
Backlog

To be considered in a State of Good Repair by the FTA, an asset must have a condition score of more than 2.5. Otherwise, the asset falls into SFMTA's backlog, an estimate of deferred investments in infrastructure replacement or rehabilitation. The total value of SFMTA's assets is $19.6 billion. $4.9 billion, or 25% of SFMTA's total assets are backlogged, according to the FTA standard. Not all assets represented in the backlog require full replacement. Assets can be retired, replaced in-kind, or upgraded with new technology or systems.

Of the 10 Asset Classes described above, the Parking and Traffic asset class has the biggest backlog at $1.1 billion, followed by Facilities at $1.0 billion. Overhead Lines ranks highest in backlog among TSC asset classes, with a backlog of $820 million, though it has the third highest backlog amongst all asset classes. While the overall condition of the Overhead Lines is 3.0, which is in the Adequate range, many assets within the class are approaching the 2.5 threshold for being considered in a State of Good Repair. Without significant investment Overhead Lines will fall out of a State of Good Repair, decreasing service reliability.

Of the $4.9 billion total backlog, $3.2 billion or 16% of total assets were at or beyond their useful life, or End-of-Useful-Life (EUL). The asset class with the highest value of assets past EUL is Facilities at $894 million, followed by Overhead Lines and Stations at $685 million and $680 million respectively. The EUL backlog valuation for Track shows that $320 million, or 94%, of the total $340 million backlog is for assets past their useful life.

FIGURE 3: REPORTED ASSET BACKLOG (FTA) vs EUL

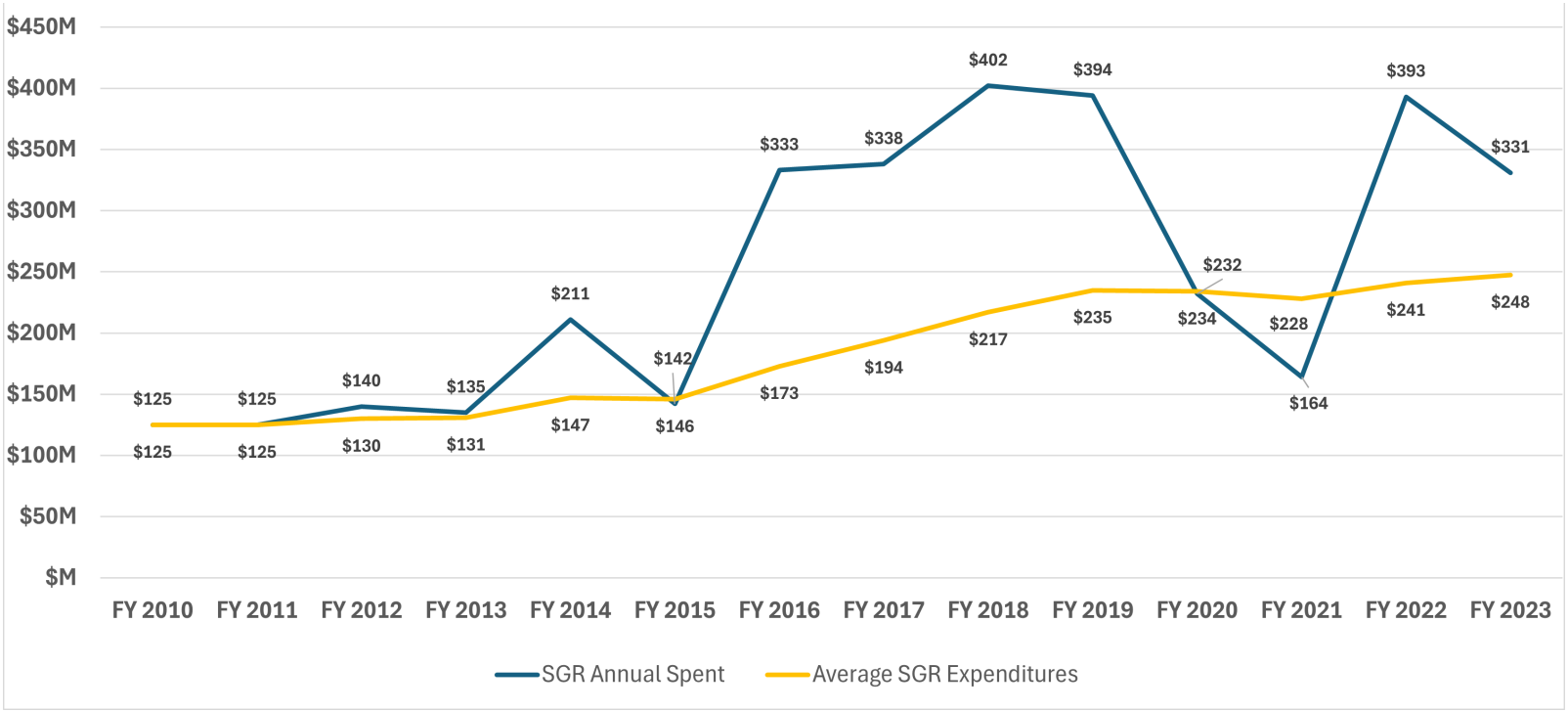


The largest discrepancy between the backlog and the end-of-life valuation is in the Parking and Traffic asset class. The backlog valuation for the Parking and Traffic asset class is $1.1 billion, while the EUL valuation is $305 million, or a 73% decrease. This decrease means that there are many assets that have a condition score of less than 2.5 but are not at the end of their useful life. This difference highlights the need for heavy future investment to maintain this revenue generating asset in a state of good repair, but the current priority should be Track related infrastructure.

Investment

SFMTA must balance the needs of the transportation system between maintaining existing infrastructure and expanding capacity. In 2010, the SFMTA made a committed to the FTA to make an average annual investment of $250 million in our assets to maintain a State of Good Repair. In FY2022-23, the SFMTA spent $393 million. This investment brought the SFMTA's annual average investment since FY 2009-10 to $248 million per year, 1% short of the commitment to the FTA. Although SFMTA's average State of Good Repair expenditure is slightly less than its commitment to the FTA, the annual investment has increased over time as displayed in Figure 4: SGR Annual Spent.

FIGURE 4: SGR ANNUAL SPEND



The SFMTA needs to invest above the current rate of $250 million per year over the next 20 years, or aging assets will cause the backlog to grow. Based on the FY2022-23 condition score analysis, the SFMTA's goal to invest $250 million per year is insufficient to address the backlog. Without accounting for inflation, to eliminate the entire reported asset backlog the SFMTA would need to invest an average of $915 million per year for 20 years.

$917M/yr — Full Scheduled Asset Replacement & Eliminate Backlog

$250M — Annual State of Good Repair Investment Target

Recommendations

As described above, the SFMTA condition score does not incorporate maintenance or condition assessment data, likely impacting the accuracy of the scores. To improve our understanding of the State of Good Repair, the SFMTA should integrate maintenance data with the capital asset inventory data to get a more accurate condition score for our assets. SFMTA is making progress toward this goal. For example, the agency started incorporating mileage into the formulation for Non-revenue Vehicles condition scores, and Midlife overhauls are included in the condition scores of Motorcoaches and Trolley Coaches.

Additionally, SFMTA would need to invest $915 million per year for the next 20 years to address the backlog. Due to limited funding, SFMTA has the resources to invest $250 million per year, only 27% of the needed amount. As such, SFMTA should continue to use data about the state of repair to advocate for additional funding to maintain its assets.

Introduction

What is a State of Good Repair?

A State of Good Repair is essential for ensuring that the SFMTA's transportation system operates smoothly and efficiently. The SFMTA defines an asset as being in a State of Good Repair when it functions at a full level of performance. The key elements of the State of Good Repair include:

1. **Function:** The asset fully performs its intended role.
2. **Safety:** The asset does not pose any safety risks to employees or the public.
3. **Value:** The asset operates within its useful life and planned cost.

Investments that help maintain this full performance are classified as State of Good Repair investments. This definition excludes active projects to enhance or expand the system. New assets from such projects are only incorporated into State of Good Repair investments once they are substantially completed.

State of Good Repair Policies

The SFMTA has specific policies guiding staff efforts to keep the transportation systemin a State of Good Repair, including a clear definition of what a "State of Good Repair" is, along with other standards and protocols:

1. **Definition:** An asset is in a State of Good Repair when it operates at full performance.

2. **Standards:** The Asset Management Program establishes standards for asset conditions and reporting methods, defining performance expectations for each Asset Class.

3. **Performance Metrics:** Each Asset Class has specific indicators, such as condition, safety, and reliability, to evaluate its State of Good Repair.

4. **Governance and Approval:** The Asset Management Steering Committee reviews and approves performance metrics for assets.

5. **Departmental Asset Evaluation:** SFMTA divisions regularly assess their assets to determine investment needs in the Capital Improvement Program.

6. **Annual Performance Review:** The Asset Management Unit (AMU) publishes an annual State of Good Repair Report, detailing the impact of capital investments on SFMTA's assets.

These policies, first established in 2018, are integrated into the agency's Capital Plan and Program Policies and guide asset management efforts.

Function

Safety

Value

Asset Standards

To effectively manage its infrastructure, SFMTA organizes its assets into specific categories to guide investments and prioritize repairs. Assets are grouped into Asset Classes, a system established in 2009 to align with FTA reporting standards. [3] SFMTA's ten asset classes are:

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

SFMTA also categorizes State of Good Repair assets into two groups: Transit Service Critical and Other State of Good Repair. Transit Service Critical investments focus on assets essential for safe and reliable transit, like overhead wires, rail tracks, and vehicles. Other State of Good Repair investments improve rider comfort and maintain non-transit infrastructure, such as pedestrian paths, bike lanes, and parking.

Capital Asset Inventory

All SFMTA assets are listed in the Capital Asset Inventory (CAI), a detailed registry of all physical infrastructure owned by SFMTA, categorized by different Asset Classes and Capital Improvement Programs (CIPs). It includes data on in-service dates, estimated useful life, and replacement values. This data helps SFMTA plan for future needs by modeling when assets need replacement or rehabilitation. Currently, the CAI contains nearly 7,000 entries.

The Asset Management Unit uses data from the CAI to provide a clearer picture of asset conditions. This involves sharing data with partner agencies, such as preparing reports for the FTA's National Transit Database (NTD) and contributing to the Metropolitan Transportation Commission's Regional Transportation Commission Inventory (RTCI) database. Such reports ensure accurate, comprehensive information is available to transit leaders locally and nationally for decision-making and various compliance efforts.

While the CAI provides an annual snapshot of capital assets, AMU's long-term goal is to integrate more real-time data to provide an ongoing view of asset conditions. Connecting the CAI to maintenance and accounting systems is key for evaluating the success of capital investment strategies and improving decision-making.

3 Since SFMTA also operates as a Department of Transportation (DOT), additional classes were added for non-transit infrastructure, such as roads and pedestrian pathways.

Condition Scores

The State of Good Repair Report provides scores on the condition of the SFMTA's capital assets based on Federal Transit Agency (FTA) condition standards. SFMTA uses an asset management software called PSD Citywide (PSD) [4] to store asset data and calculate a condition score on a scale of 1 (poor) to 5 (excellent). The scale was developed by the FTA and is detailed in Table 1: FTA Transit Economic Requirements Model (TERM) Scale.

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An overall condition score for the transportation system is generated from the cumulative, value-weighted average of those individual scores. The value weight is determined by the replacement value of the asset it assesses. This is the amount that the SFMTA would pay to replace an asset at the present time. According to the Federal Transit Administration (FTA), a transportation system is considered in a State of Good Repair if its condition score is 2.5 or higher.

Currently, SFMTA's analysis bases condition scores primarily on asset age, meaning the score decreases as the asset nears the end of its useful life. Useful life refers to the benchmark number for how long a specific type of asset is expected to function, typically defined by the FTA or the manufacturer. Some examples of useful life by common SFMTA asset are:

- **Buses:** Large, heavy-duty transit buses (35'-40') have a useful life of at least 12 years or 500,000 miles.
- **Trolleys:** Fixed guideway electric trolley buses with rubber tires have a useful life of 15 years.
- **Facilities:** The useful life of facilities, such as railroad or highway structures, can be a minimum of 50 years, while other buildings (concrete, steel, frame construction) typically last around 40 years.

Age-based condition scores do not account for factors such as usage intensity or specific operating conditions. SFMTA does update condition scores when replacement or maintenance projects are put into service, though in most cases, it does not include minor rehabilitation projects. To improve accuracy, SFMTA made plans to incorporate these sorts of additional factors in its assessments as part of the 10-Year Asset Management Strategy. [5]

4 More information regarding PSD Citywide is in Appendix B.
5 The 10-year Asset Management Strategy is discussed further in Appendix A

As of 2022, SFMTA has begun incorporating mileage data for non-revenue vehicles into its condition scores. By using more specific data, SFMTA can better prioritize assets that need immediate attention, allowing for more efficient resource allocation. Accordingly, the SFMTA plans to incorporate use-based condition data from recent and planned condition assessments to more accurately model the condition of its assets. Such condition assessments have included and are planned for:

· Traffic Signals
· All Muni Metro stations
· Street curb and facilities, and
· Overhead line pole inventory

This refined condition scoring will support a more precise state of good repair assessment and more data-driven investment decisions and project development.

Transit Asset Management (TAM) Plan

The State of Good Repair Report is a key element of the Agency's Transit Asset Management (TAM) Plan, a strategic document required by the FTA of every transit provider that receives federal financial assistance. [6] The TAM Plan aids 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.

The TAM plan provides a clear strategy for monitoring and evaluating progress towards improved asset management practices and outcomes, and is updated every four years to comply with FTA requirements. [7]

This past year, SFMTA made strides toward achieving several TAM goals, including:

- **Goal 1:** Condition Assessment Methods. Agency completed a Traffic Signals Condition Assessment, which provided a detailed inventory and condition data of a select number of traffic signals across San Francisco.

- **Goal 3:** Update Enterprise Asset Management System (EAMS). The agency uses EAMS to track maintenance work orders and parts. In 2023 AMU initiated conversations with the IT team to develop a crosswalk between EAMS and PSD Citywide to allow for more informed, precise financial forecasts.

- **Goal 7:** Internal TAM Communication. Agency reestablished the SFMTA asset management group, which is a group of asset stakeholders that meet bi-monthly to discuss strategies to improve the SFMTA asset management program.

6 In July 2016, 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, requiring the creating a TAM plan under 49 U.S.C. Chapter 53.

7 In the Fall of 2018, the SFMTA completed its inaugural TAM Plan. In the Winter of 2019, the SFMTA established the Asset Management Unit to implement the TAM Plan. The full 2022-2026 TAM Plan Strategic Goals and progress can be found in Appendix C: 2022 TAM Strategic Goals.

- **Goal 8:** Review Agency TAM Maturity. Agency incorporated National Transit Database (NTD) [8] performance measures into the State of Good Repair report to grow our capacity to demonstrate progress on the maturity of our asset management practices to the FTA, annually. In 2022, AMU set performance measures to include in the FY2022-23 report, including useful life benchmarks for revenue (rolling stock) and non-revenue (equipment) vehicles. [9]
- **Goal 10:** PSD Citywide. SFMTA fully transitioned its Capital Asset Inventory to PSD Citywide, a state-of-the-art asset management software that enables real-time updates and more detailed reporting. AMU also incorporated a 2013 parking garage condition assessment into data for parking garage assets.

Complimenting the TAM Plan, SFMTA also developed a 10-Year Asset Management Strategy [10] in 2016 to further improve asset management practices. This strategy provides an annual cycle of actions to take for continuous improvement, focusing on enhancing processes, tools, and personnel involved in managing assets. The AMU remains dedicated to refining these practices yearly to ensure more efficient operations.

8 Congress established the NTD to be the Nation's primary source for information and statistics on the transit systems of the United States. Statute requires that recipients or beneficiaries of grants from the Federal Transit Administration (FTA) under the Urbanized Area Formula Program (§5307) or Other than Urbanized Area (Rural) Formula Program (§5311) submit data to the NTD.

9 More details about the performance measures, target goals, and analysis can be found in Appendix D: NTD – Transit Asset Management Performance Measure Targets.

10 More detail on SFMTA's 10-Year Asset Management Strategy can be found in the Appendix A.

State of Good Repair Analysis

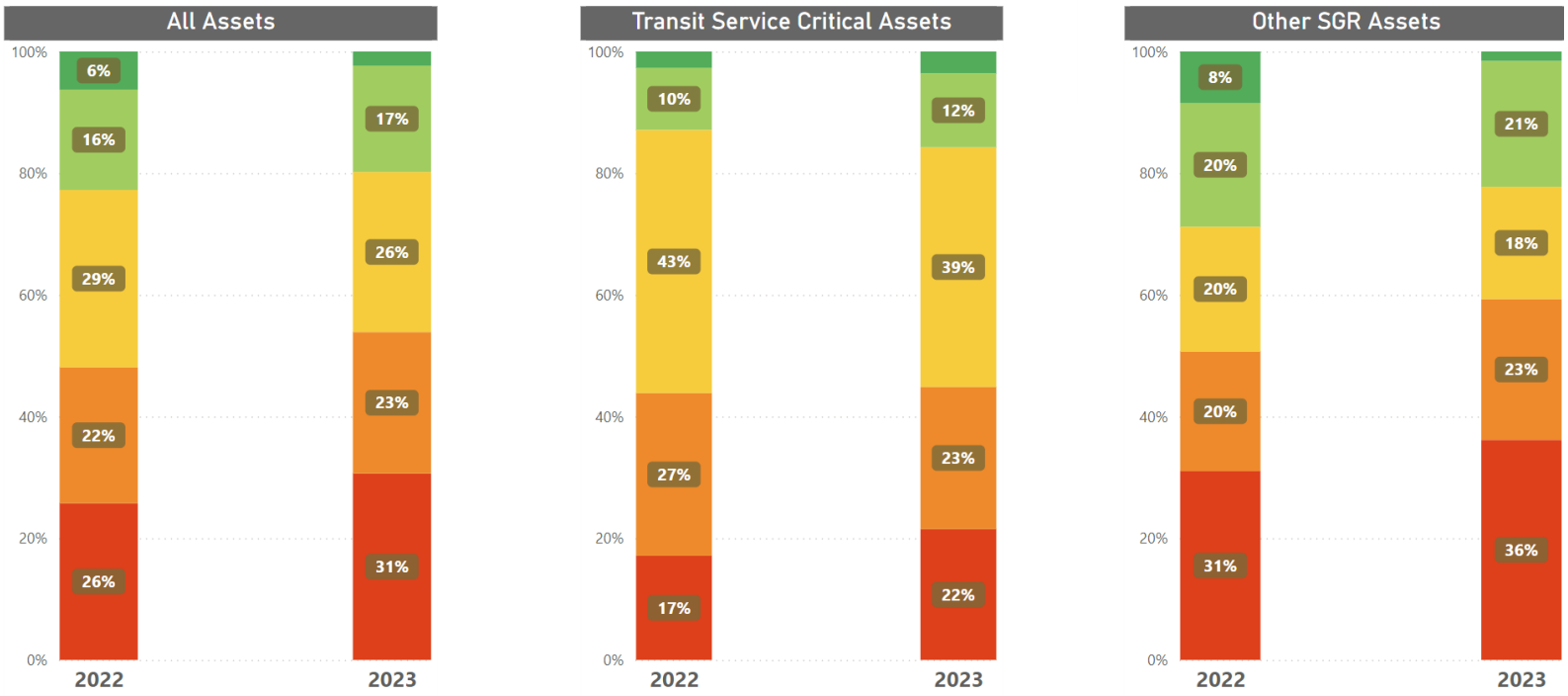
Asset Condition Scores

Asset Condition Scores are largely based on the age of an asset and use a scale of 1 (poor) to 5 (excellent). The SFMTA calculates an average condition score of the agency's assets, weighted by asset replacement cost. This means the more valuable the asset, the more impact it has on the overall condition score. For example, it is more detrimental to the overall agency score if a higher-value asset, like a light rail vehicle, has a low condition score than if a lower-value asset does, like a non-revenue truck. Weighing the scores creates a more accurate representation of the overall condition of the transportation system.

The weighted average condition score for all SFMTA assets in FY2022-23 is 3.02, which is a 1.3% decrease from the prior year score of 3.05. Assets with a score of 2.5 or higher are in a State of Good Repair, as defined by the FTA. Therefore, overall SFMTA assets are in 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 in Appendix C: TAM Strategic goals.

Figure 7 displays asset condition score separated into two categories: Transit Service Critical (TSC) and Other State of Good Repair (OSGR) assets. Transit Service Critical assets have a higher average condition score than Other State of Good Repair assets at 3.2 and 2.6, respectively. TSC assets are still in Adequate condition despite a 2.9% decrease in their overall score, likely due to aging and insufficient replacement or refurbishment over the year. OSGR assets are in Marginal condition, with a 4.0% decrease in overall condition score from the prior year. These scores are a direct result of available funding and policy decisions to prioritize investments in TSC assets over Other SGR assets

FIGURE 7: ASSET CLASS CONDITION SCORES BY TRANSIT CRTICALITY



Figures 8 and 9 provide detailed breakdowns of asset condition by Capital Program and Asset Class, respectively. Limited investment has led to lower condition scores for Parking & Traffic assets. Portsmouth Square parking garage is among the poorest performing asset in the Parking and Traffic asset class. Some of the worst-performing traffic signal assets are located along the Embarcadero. There are 23 intersections with an average condition score of 1.46.

FIGURE 8: AGE BASED CONDITION SCORE BY CAPITAL PROGRAM

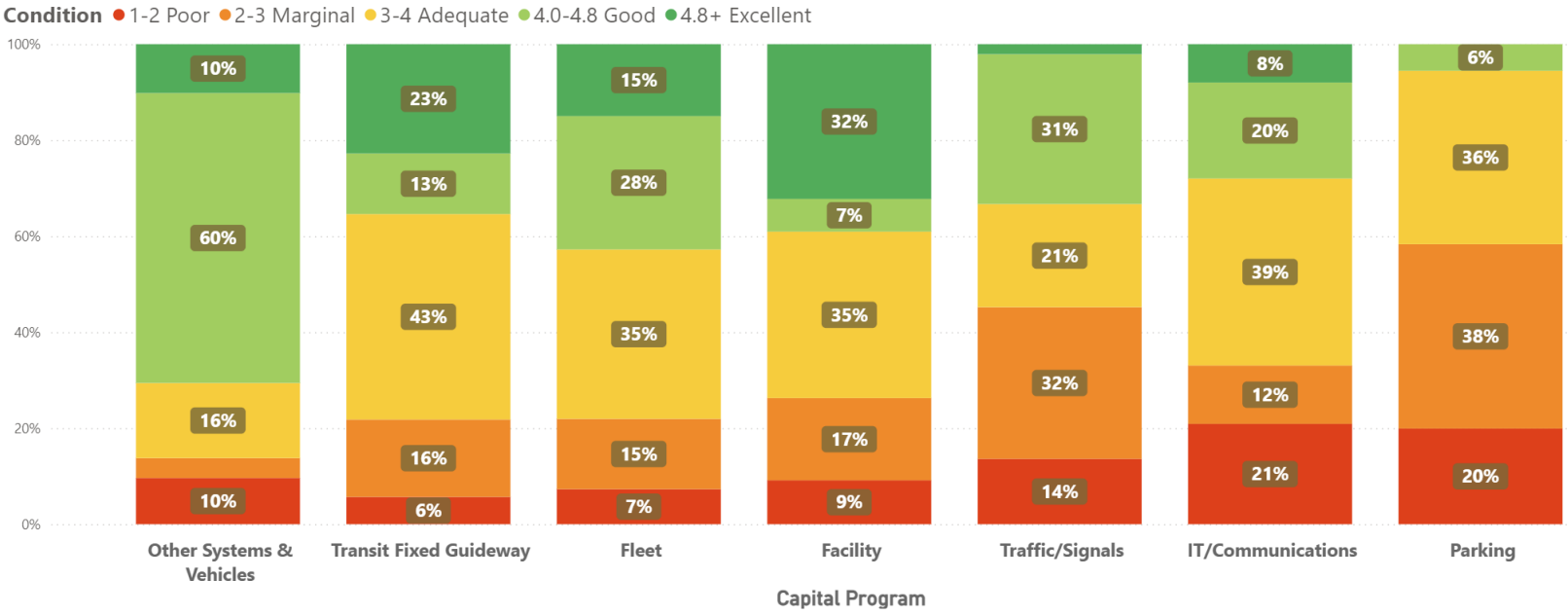


FIGURE 9: AGE BASED CONDITION SCORE BY ASSET CLASS

Often overlooked is the Other Systems and Vehicles asset class. Assets in this class are typically associated with paratransit and non-revenue vehicles. This asset class also houses some of the transportation system's most critical assets, such as substations. A substation is a facility that converts standard AC electricity from the power grid into the specific voltage and current needed to power light rail vehicles. The King Street substation was recently renovated while the Central Subway was in construction. This resulted in the overall substation condition score rising above 2.5. Prior to the renovation, the average substation score was 2.47 which is under the FTA backlog threshold.

The SFMTA has also begun taking steps to improve asset conditions in lower-rated categories. Some examples include ongoing parking and traffic projects such as replacing all parking meters across the city with an estimated completion of Spring 2025, and phase 2 of the Western Addition signal upgrade. For the Track asset class, the SFMTA has implemented Muni Metro Fix-It week and Twin Peaks tunnel shutdown.

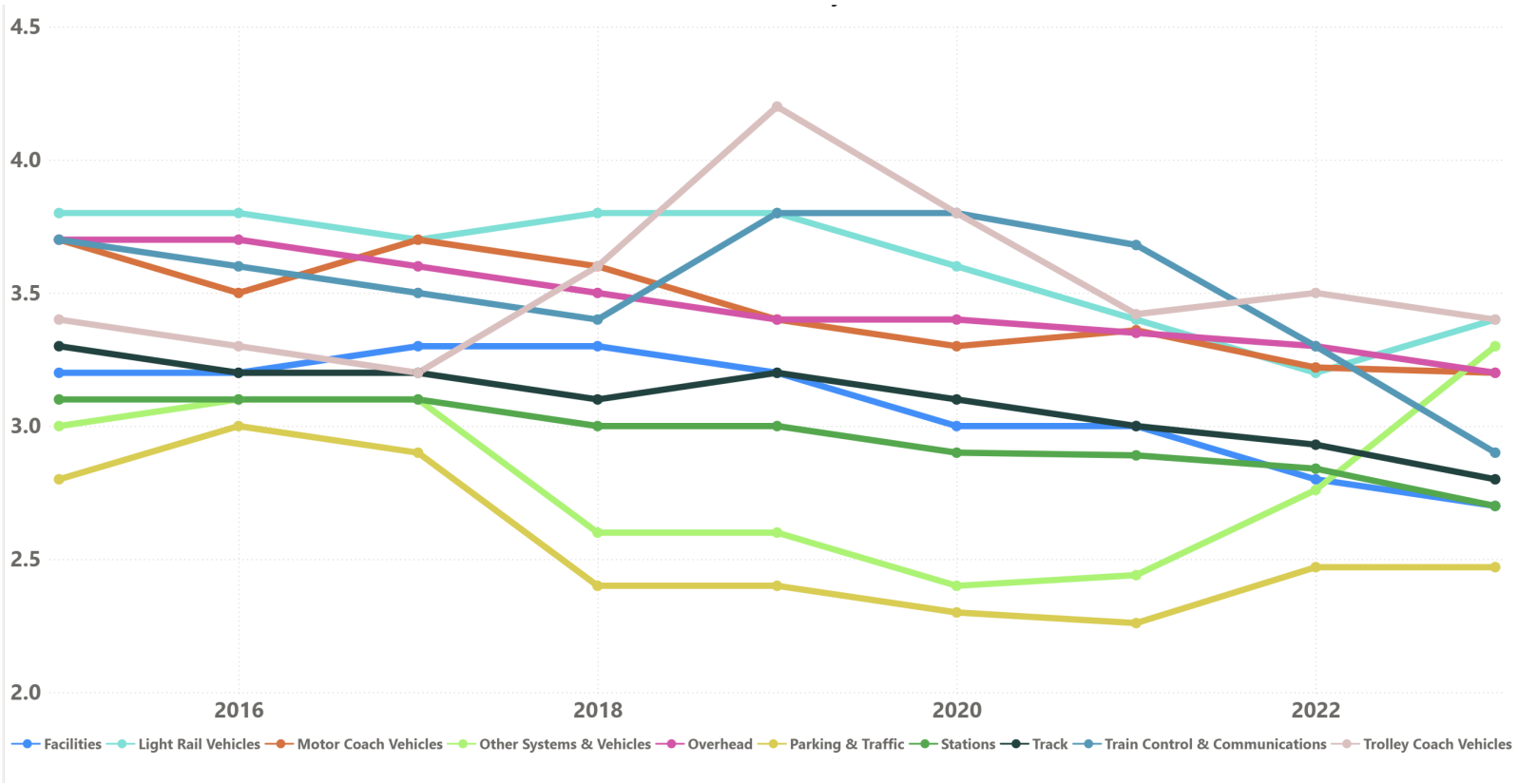
Asset Condition Scores Trends

Figures 10 and 11 provide a breakdown of average condition scores by Asset Class over time, weighted by asset replacement value. The average condition scores are based mostly on the useful life of the assets. Some assets such as parking garages, Motor/Trolley Coaches, non-revenue vehicles have condition assessments or operational use incorporated into their condition scores, though the age of the assets described largely influences these scores.

FIGURE 10: ASSET CLASS CONDITION SCORES FROM 2018 – 2023

Asset Class	2018	% change	2019	% change	2020	% change	2021	% change	2022	% change	2023	% change
Facilities	3.3	0%	3.2	-3%	3	-6%	3.0	0%	2.8	-6%	2.7	-3%
Light Rail Vehicles	3.8	3%	3.8	0%	3.6	-5%	3.4	-6%	3.2	-6%	3.4	5%
Motor Coach Vehicles	3.6	-3%	3.4	-6%	3.3	-3%	3.4	2%	3.2	-5%	3.2	-2%
Other Systems & Vehicles	2.6	-16%	2.6	0%	2.4	-8%	2.4	2%	2.8	15%	3.3	19%
Overhead	3.5	-3%	3.4	-3%	3.4	0%	3.4	-1%	3.3	-1%	3.2	-3%
Parking & Traffic	2.4	-17%	2.4	0%	2.3	-4%	2.3	-2%	2.5	11%	2.5	0%
Stations	3	-3%	3	0%	2.9	-3%	2.9	0%	2.8	-3%	2.7	-3%
Track	3.1	-3%	3.2	3%	3.1	-3%	3.0	-3%	2.9	-3%	2.8	-2%
Train Control & Communications	3.4	-3%	3.8	12%	3.8	0%	3.7	-3%	3.2	-13%	2.9	-8%
Trolley Coach Vehicles	3.6	13%	4.2	17%	3.8	-10%	3.4	-10%	3.5	2%	3.4	-1%

FIGURE 11: ASSET CLASS CONDITION SCORE BY YEAR



Overall, there is a stagnant or gradual decline in condition across most of the asset classes except for Light Rail Vehicles and Other Systems & Vehicles. Other Systems and Vehicles had a 19% increase in condition score due to replacement of Subway Tunnel Lights and the King Street substation. Additionally, revenue vehicles in the Light Rail, Motor Coach, and Trolley Coach asset class categories are routinely replaced, as reflected by score increases in years where vehicles were procured. For example, in 2019 the condition score for Trolley Coaches went from 3.2 in 2017 to 3.6 in 2018 and then 4.2 in 2019 due to three years of consistent procurement.

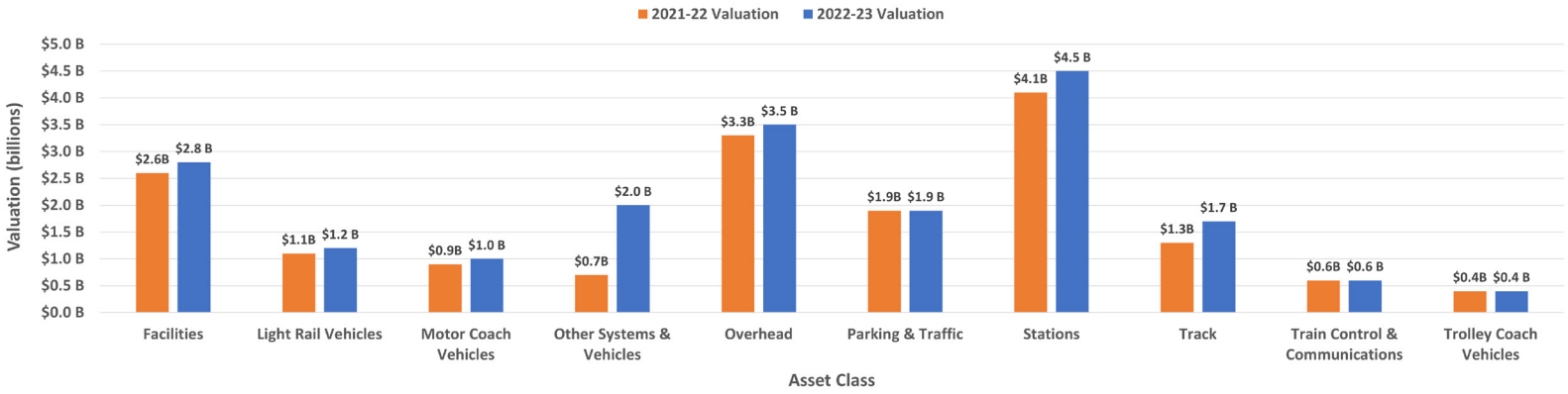
Conversely, Facilities assets show a slow but consistent decline in condition scores year over year. This trend is a result of the assets' high replacement values and long estimated useful lives. Investments in the SFMTA's oldest facilities as identified in the Building Progress facilities renewal program will raise this score as they are implemented. Overhead Lines condition scores are also steadily declining, though this asset class is still in Adequate condition due to annual inspections and regular maintenance.

Finally, Parking and Traffic, representing the SFMTA's parking garages and traffic signals, have historically received less investment compared with Transit Service Critical asset classes. Despite less investment, the overall condition score for Parking and Traffic has remained unchanged year over year.

Asset Replacement Value

The FY2022-23 State of Good Repair analysis finds a total replacement value of $19.6 billion for the SFMTA's assets. Figure 12 shows the total reported replacement value for all recorded assets by asset class compared with the previous year.

FIGURE 12: TOTAL REPLACEMENT VALUE BY ASSET CLASS



The FY2022-23 value is higher than the FY2021-22 value by $2.6 billion, or 16%. The increase is due to the application of a 3.5% inflation rate to assets replacement cost and inclusion of Central Subway assets. More specifically, the application of the inflation rate and inclusion of Central Subway assets explains the large increase in replacement cost for Stations, Track, and Overhead Lines. Light Rail Vehicles replacement costs also increased due to higher actual procurement costs than previously assumed. In previous reports, the valuation for old Breda Vehicles was lower than the cost of the Light Rail Vehicles that replaced them.[11]

11 It should be noted with the total cost of the Central Subway being $1.6B, Track assets may be undervalued and will need to further be investigated and researched to develop a more accurate valuation.

Reported Asset Backlog

AMU conducted an analysis of the SFMTA's asset condition using two different approaches to evaluate investment need, estimating the replacement cost of assets:

1. Below FTA's standard for State of Good Repair, and

2. Past their End of Useful Life (EUL).

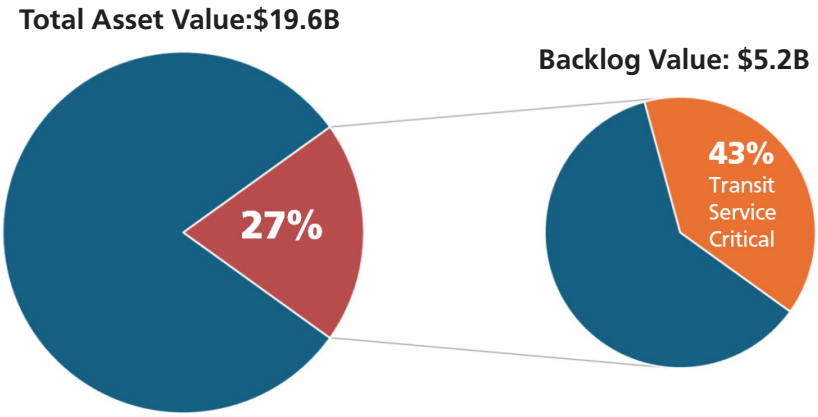
To be considered in a State of Good Repair by the FTA, an asset must have a condition score of more than 2.5. All other assets fall into SFMTA's backlog, an estimate of deferred investments in infrastructure replacement or rehabilitation. An asset in the backlog is not necessarily past its useful life or unable to perform safely and reliably. Estimated Useful Life (EUL), however, is defined as the maximum period during which an asset will serve its intended use. EUL 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, its full replacement value is included in the backlog. As the number of assets reported in the SFMTA backlog grows, the total amount of investment needed to maintain a State of Good Repair also grows. Examining the asset class and value of those assets in the backlog that are past their useful life (EUL) allows the SFMTA to gain a more detailed view of areas of highest need.

Analysis Findings

As displayed in Figure 13, the SFMTA's FY2022-23 reported backlog has a total value of $5.2 billion, about a 12% increase over the prior year's figure. $2.2 billion (43%) of the backlog is comprised of Transit Critical assets, and $2.9 billion (57%) is Other State of Good Repair assets. For Transit Critical assets, this is a 20% increase from the prior year, mostly driven by the addition of Train Control to the backlog, where useful life was adjusted by subject matter experts from 30 years to 25 years causing it not only to fall below the 2.5 threshold, but also to be past its useful life. However, a project to replace SFMTA's train control system is already planned and partially funded.

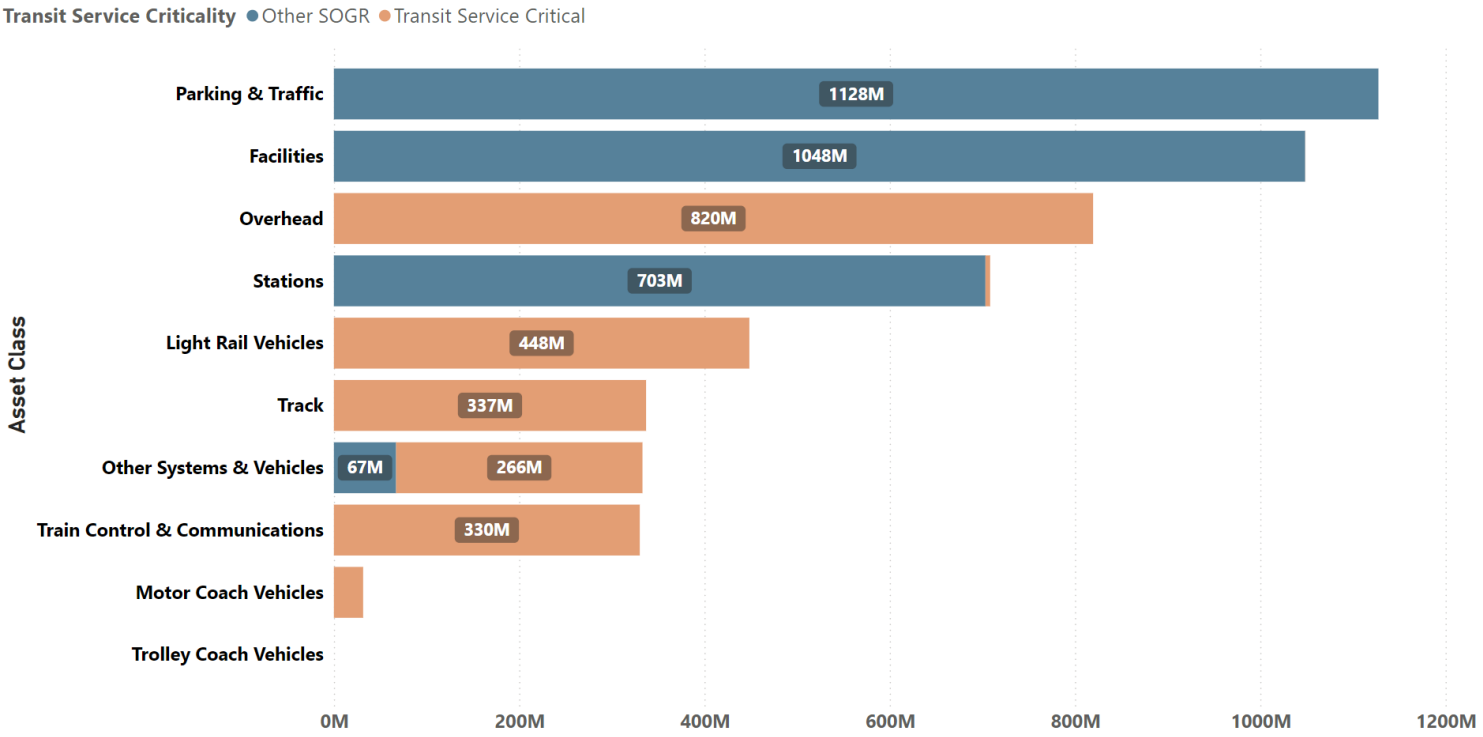
Overall, the backlog represents 27% of SFMTA's total asset value. The high backlog figure shows that the SFMTA has more assets than it can maintain at its present time and there is not enough money to drastically improve the system.

FIGURE 13: BACKLOG AS % OF TOTAL ASSET VALUE



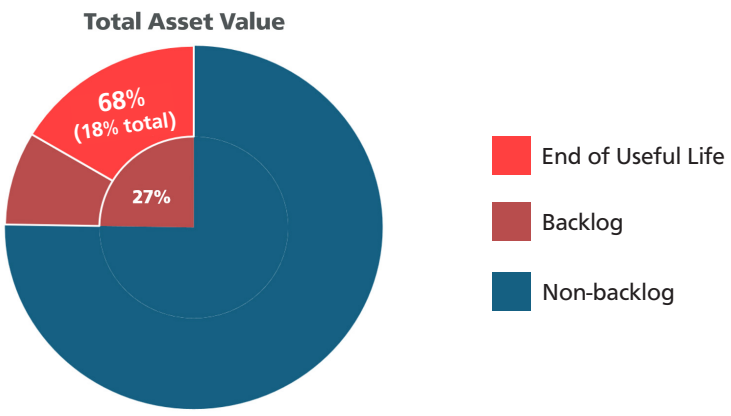
The highest FTA backlog valuations, as seen in Figure 14: 2023 Reported Asset Backlog by Asset Class, are Parking and Traffic ($1.1 million) and Facilities ($1.0 million), followed by Overhead lines ($820 million). Failure to maintain these assets will impact and degrade transit service. For example, assets in Parking in Traffic also include traffic signals and bus priority lanes, if not properly maintained will affect service reliability. Conversely, SFMTA's fleet is generally in a State of Good Repair with Trolley, and Motor Coach Vehicles having the lowest backlogs. Light Rail Vehicles have a backlog of $448.4 million, which consists of old Breda Light Rail vehicles, earmarked for replacement upon the arrival of new vehicles in the next 2-3 years. The condition of these assets is historically stable due to regular investments to maintain the fleet, as well as long-term plans to overhaul and replace the fleet.

FIGURE 14: 2023 REPORTED ASSET BACKLOG BY ASSET CLASS



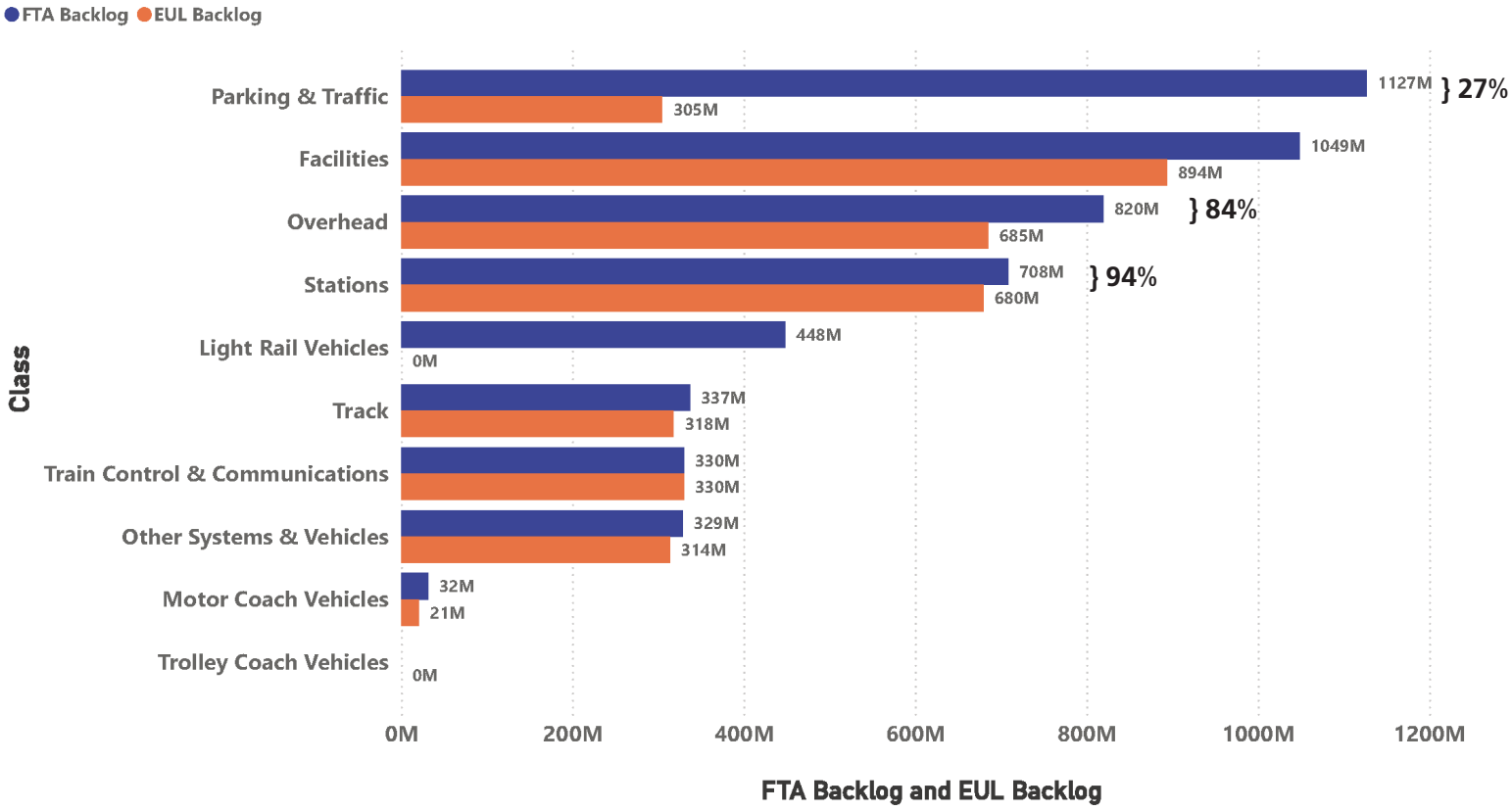
As illustrated in Figure 15: End of Useful Life Value, $3.5 billion (68%) of the $5.2 billion backlog represents assets that are past their useful life. More broadly, the total value of assets past EUL represents 18% of total asset value

FIGURE 15: END OF USEFUL LIFE VALUE



When focusing only on assets that are at the end of their useful life by asset class, as shown in Figure 16: Reported Asset Backlog (FTA) vs EUL, Parking and Traffic is no longer in the asset class requiring the highest investment as compared to other classes. That distinction now belongs to the Facilities asset class, followed by Overhead and Stations. Additionally, only 27% of the Parking and Traffic asset class backlog valuation represents assets not beyond their useful life, as compared to 94% and 84% for Track and Overhead respectively as shown in Figure 16. This data comparison shows that there is a greater need to prioritize Track and Overhead, rather than Parking and Traffic assets due to their importance to the overall transportation system as well as the age of the assets.

FIGURE 16: REPORTED ASSET BACKLOG (FTA) VS EUL



The breakdown between Transit Service Critical and Other State of Good Repair assets shows that, due to available funding, the SFMTA historically focused investment in Transit Service Critical assets, particularly revenue vehicles, as they show a relatively smaller EUL backlog. However, asset classes reporting no backlog may still require high levels of investment in future years in efforts to be more proactive to maintenance and replacement needs than to be reactive which can drive costs even higher. Proactive maintenance can result in extending useful life of assets.

Based on this analysis, the AMU recommends prioritizing assets in the backlog that are past their useful life (EUL backlog), with a continued focus on transit critical asset classes. Investments in transit-critical assets like Track and Overhead improve the reliability and timeliness of transit. However, proper coordination of these asset maintenance projects is necessary early in the planning process to ensure sufficient resources are available, labor and otherwise, to complete projects on time. Coordination with multiple agencies and developing projects by intersection or corridors to address multiple asset classes can reduce conflicts which can lead to increased budgets. In addition, investment decisions should consider both the backlog and forthcoming maintenance projects. For example, various Substations and parking garages are likely to fall into the Poor range within the next three years.

Additionally, 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. Additional considerations include:

· Assets in the backlog may perform as intended beyond their 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.

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 kept current in the CAI and incorporating condition assessments to more accurately record the condition of assets, the SFMTA will have a more accurate reported asset backlog and a clearer understanding of the deferred replacement need.

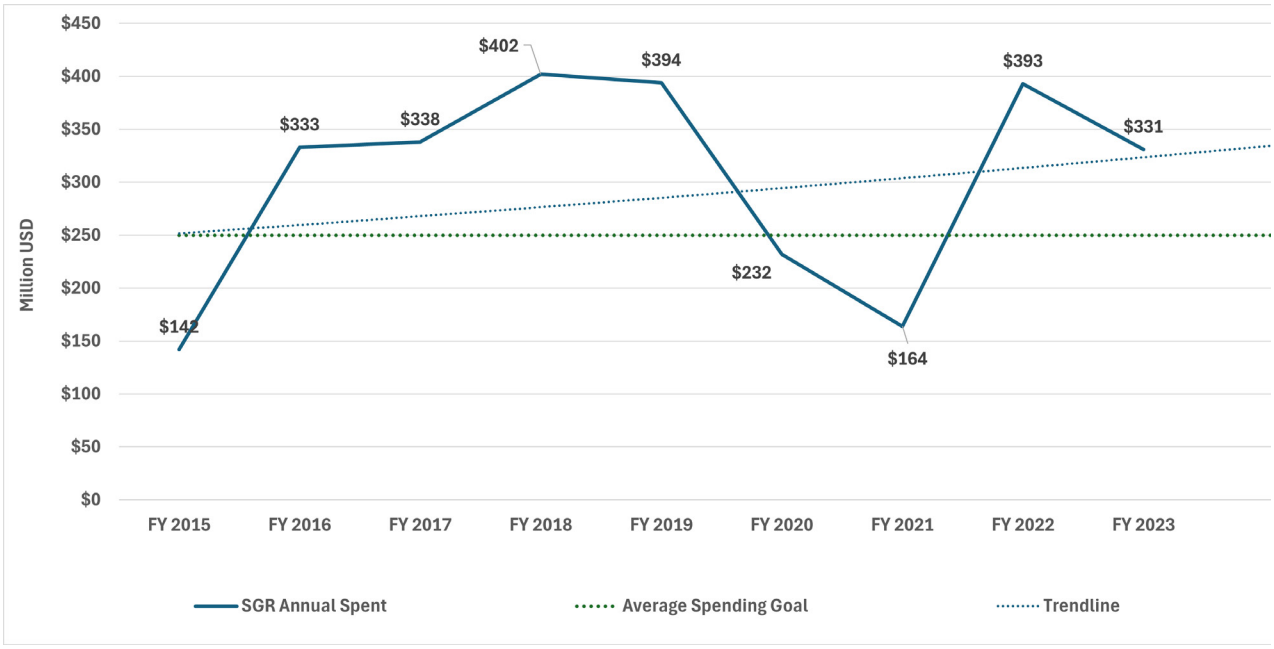
State of Good Repair Investments

In 2010, the SFMTA committed to spending an average of $250 million annually on State of Good Repair over the next 20 years. This was a condition of the SFMTA's grant agreement with the Federal Transit Administration for the Central Subway project. The commitment is intended to balance the agency's resources between maintaining a State of Good Repair and enhancing the transportation system.

FTA Commitment

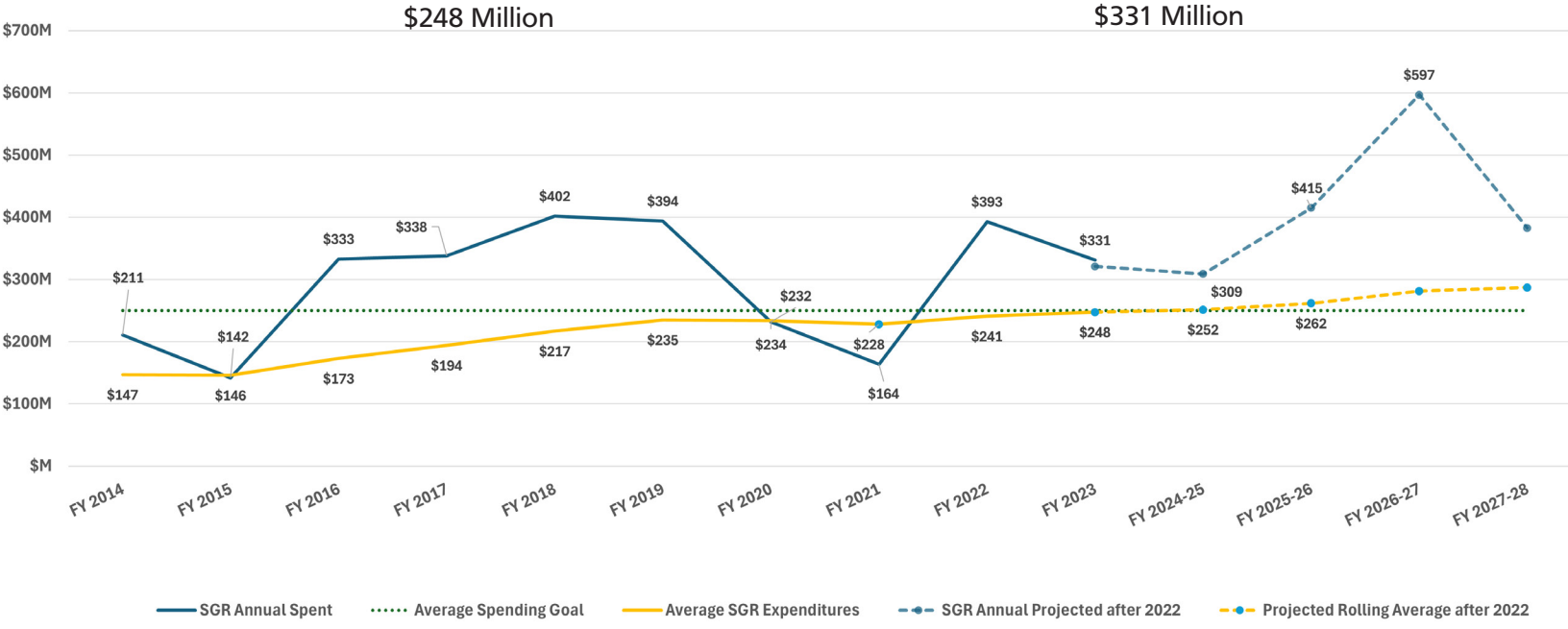
From FY 2015 through FY2023, the SFMTA met its State of Good Repair spending commitment, averaging $303 million per year in State of Good Repair expenditures. Apart from height of the COVID-19 pandemic, the SFMTA has increased its State of Good Repair expenditures nearly every year since FY 2015. From 2014 through 2018, significant investments were made to replace the Muni Fleet. Additionally, the City passed the 2014 Transportation and Road Improvement General Obligation Bond and Proposition B Transportation Population-Based General Fund Set-Aside, resulting in a substantial increase of funds for the State of Good Repair transportation projects.

FIGURE 17: END OF USEFUL LIFE VALUE



Challenges due to the pandemic significantly decreased spending on the State of Good Repair due to construction projects being delayed. As a result, the agency spent more on operating than on capital projects to deal with the transit service challenges that the pandemic presented. In FY2019-20, expenditure was $232 million, which was 41% less than FY2018-19. In FY2020-21, as the impacts of the pandemic deepened, the SFMTA spent even less than FY2019-2020, expending only $164 million, well below the commitment level. Spending recovered in FY2021-22 to $393 million, an increase of 139% over FY2020-21, to support the completion of many projects, including Van Ness BRT, Green Center Rail Replacement, and Geary BRT. For FY2022-23, spending on State of Good Repair projects was down about 19%, as large maintenance projects such as the L Taraval Rail and Overhead Rehabilitation remain under construction and cannot be counted toward the FTA commitment until substantially completed.

FIGURE 18: STATE OF GOOD REPAIR INVESTMENTS (FY2014-23 ACTUALS; FY2023-27 PLANNED)



Long-Term Investment Needs

The SFMTA must continue to invest 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.

Figure 19 shows various State of Good Repair annual investment scenarios and their impact on the reported asset backlog, including an assumed annual 3.5% escalation of the backlog. Without accounting for such escalation, the SFMTA will need to invest $18.3 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 $917 million per year for 20 years on State of Good Repair needs.

FIGURE 19: STATE OF GOOD REPAIR REQUIRED INVESTMENT LEVELS (3.5% ESCALATION)

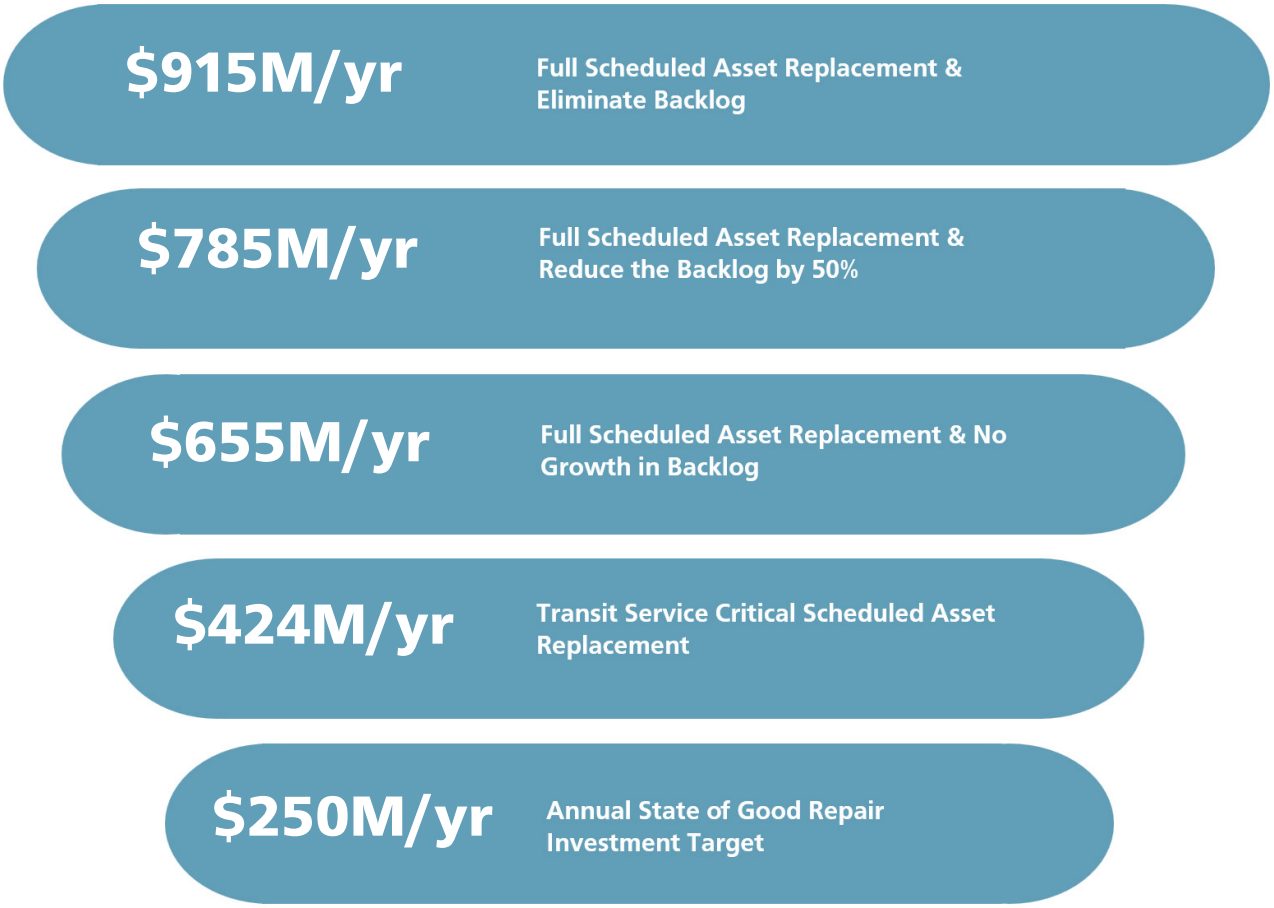
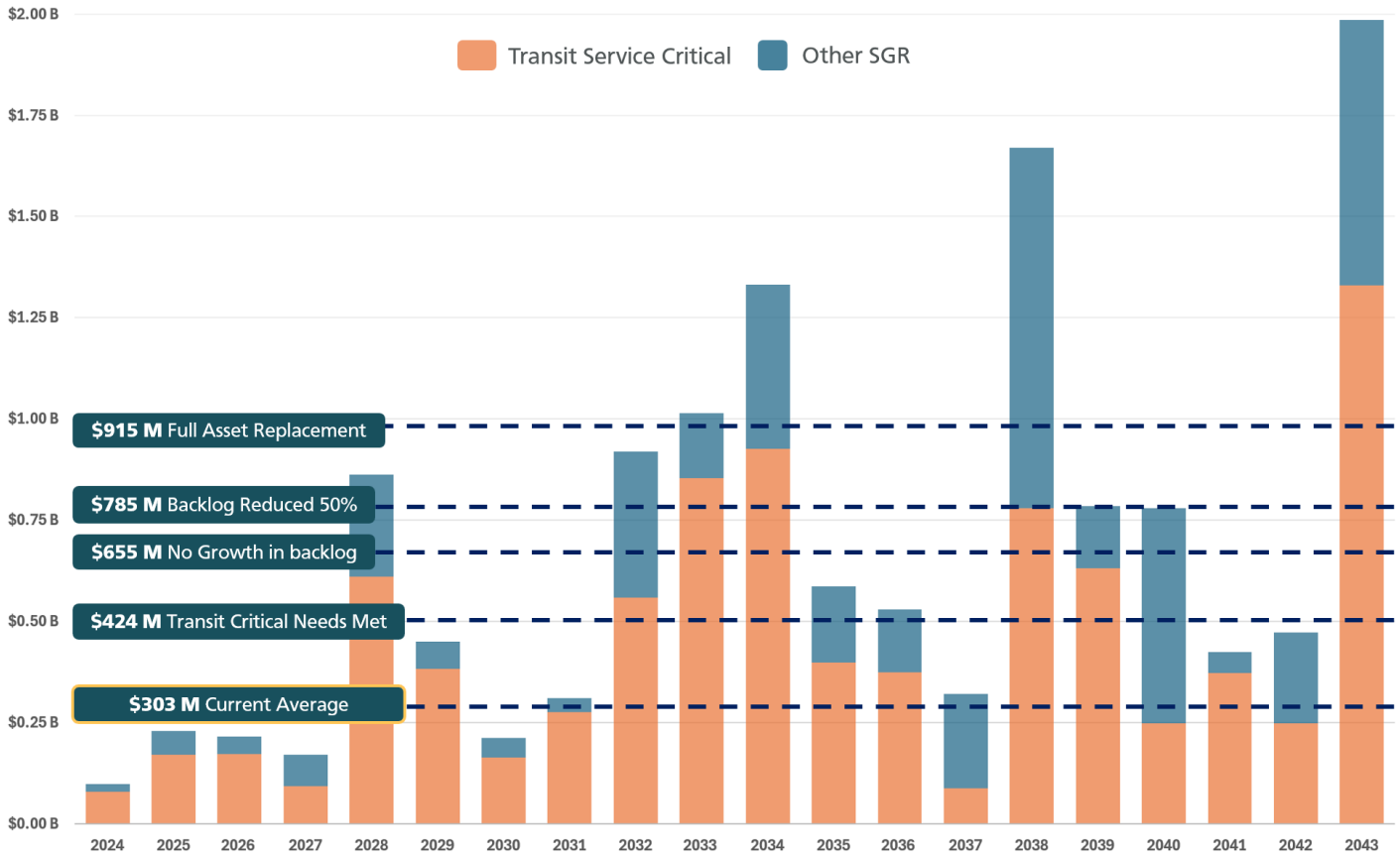


Figure 20 details the $915 million annual need to address SFMTA's backlog and meet asset replacement cycles over next 20 years. While the backlog bar is not shown in the graph, SFMTA will need to spend at least $655 million a year to address the agency's current and upcoming needs while not adding to the backlog.

FIGURE 20: 20 YEAR INVESTMENT NEED



Conclusion

In 2023, San Francisco's transportation system is generally in a State of Good Repair, with a "adequate" condition score of 3.02. However, when compared to prior years, there is a clear trend toward investment levels that are insufficient to fully address the SFMTA's aging assets. The backlog increases each year, and the overall condition score of the system is gradually declining.

The SFMTA has demonstrated the ability to reverse the downward trend of condition scores through focused investments in the past. For example, investments made in transit service critical assets resulted in rising condition scores for this asset category since reporting began in 2014. However, the long-term fiscal impact of the COVID-19 health emergency, significantly undermines the agency's capacity to make such investments in the near term. The post-pandemic decline in operating revenues reduced the number of operating dollars spent to maintain capital assets annually. Instead, the agency increasingly depends on capital dollars provided by federal, state, and local funders with specific funding priorities, introducing greater constraints on what can be funded.

Given this rocky fiscal terrain, the SFMTA should focus this limited, constrained funding on the most critical and degraded assets in the transportation system. Track and Station, both transit critical asset classes, have some of the largest backlogs and lowest age-based condition scores in the whole portfolio, signifying a need for investment. Additionally, Parking and Traffic, while not "transit-critical", provide critical support to the transit system by way of revenue generation and pedestrian safety, and need investment. The true lifecycle costs of these existing assets should be considered during the SFMTA's budget development process. The SFMTA should also consider using condition assessments, instead of just age-based scores, to provide a more accurate picture of the state of our assets. This will allow for more precise targeting of limited funds and help deliver capital improvements that will have the greatest operational impact and value to San Francisco's transportation system and to our customers.

Appendix A: SFMTA Background

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.

What is Asset Management?

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.

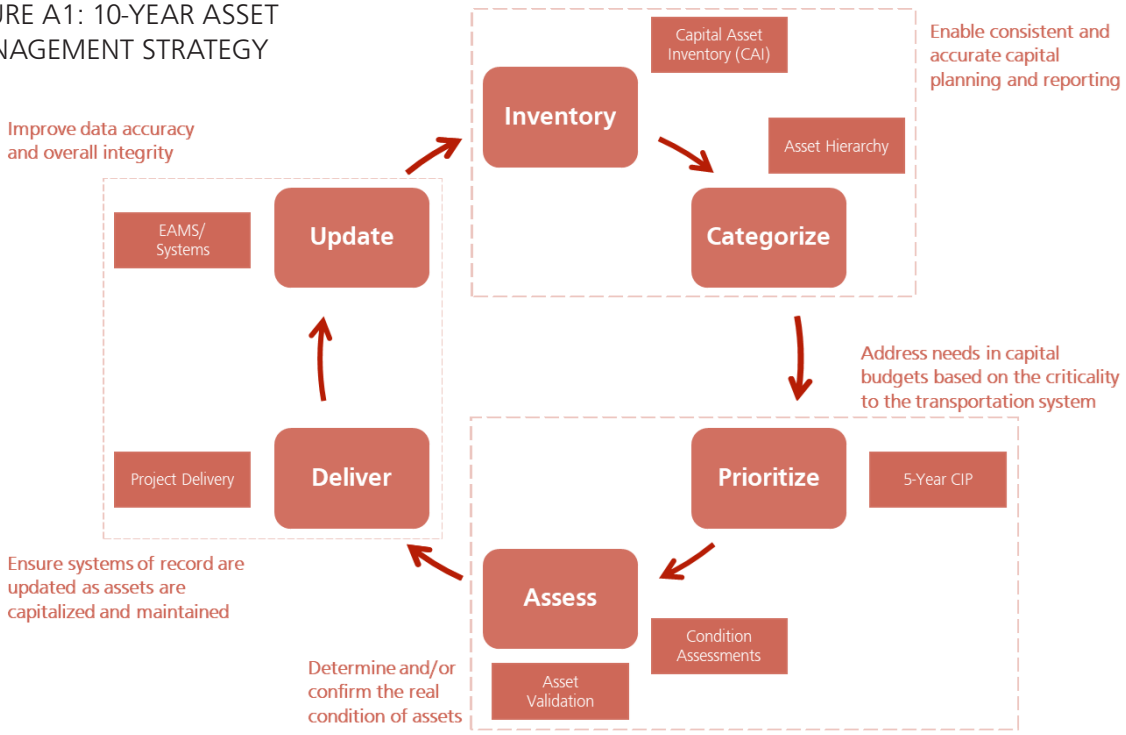
The team also supports the development of the SFMTA 20-Year Capital Plan, oversees the development and administration of the SFMTA's capital asset inventory, manages the implementation of the SFMTA 10-Year Asset Management Strategy, leads the planning, design, and implementation of condition assessments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

10-Year Asset Management Strategy

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

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

FIGURE A1: 10-YEAR ASSET MANAGEMENT STRATEGY



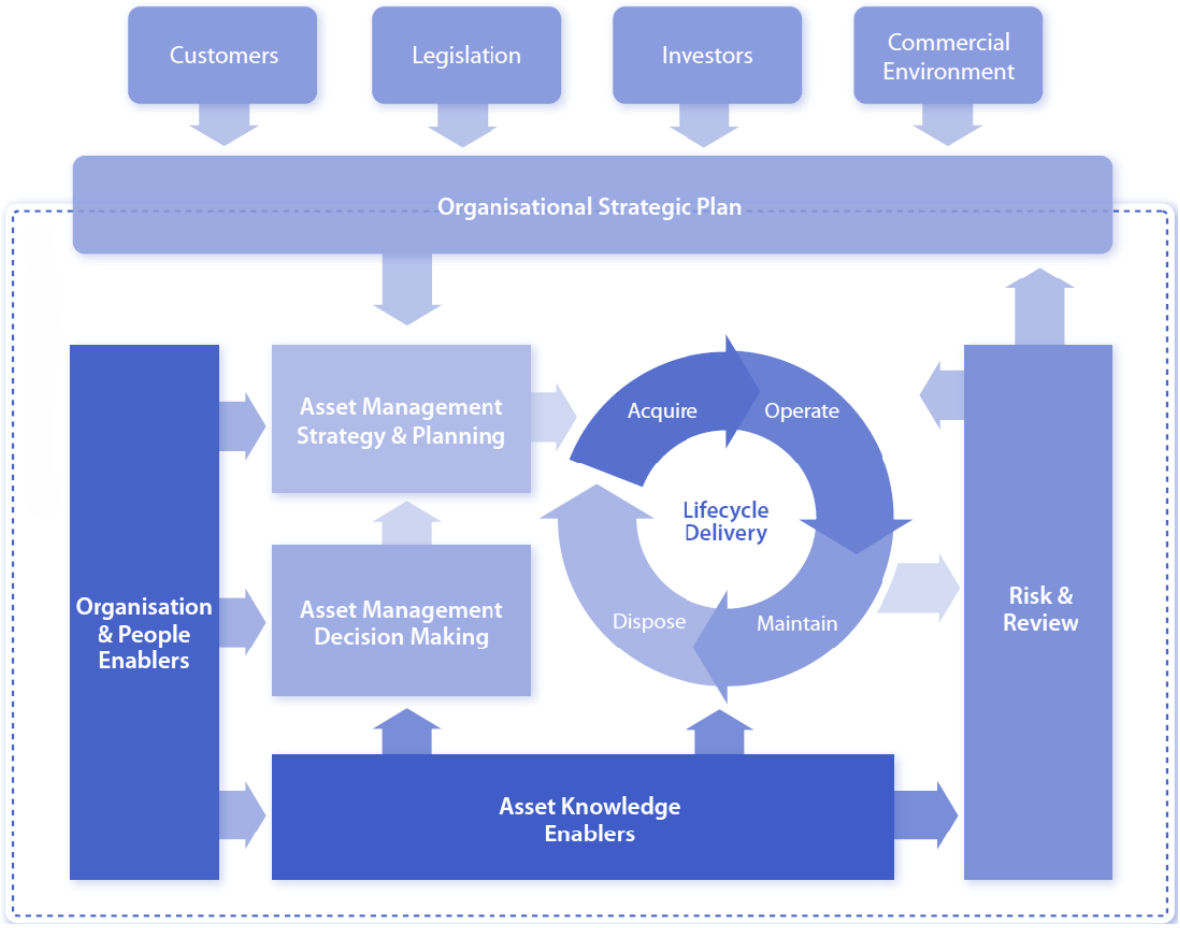
Each of the elements of the cycle above is defined as follows:

- **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 Model

Figure A2 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 2 represents the Institute of Asset Management's Conceptual Asset Management model. This model comprises a suite of six subject groups which represent processes, people, and tools that contribute to functional asset management practice within an organization.
The focus of the 10 – Year Strategy is in the center of this model, highlighting actions to align Strategy & Planning, Lifecycle Delivery, Asset Knowledge, and Asset Decision Making. It is the responsibility of the Asset Management Unit to work with stakeholders to enhance these subject groups to implement a robust asset management program at SFMTA.

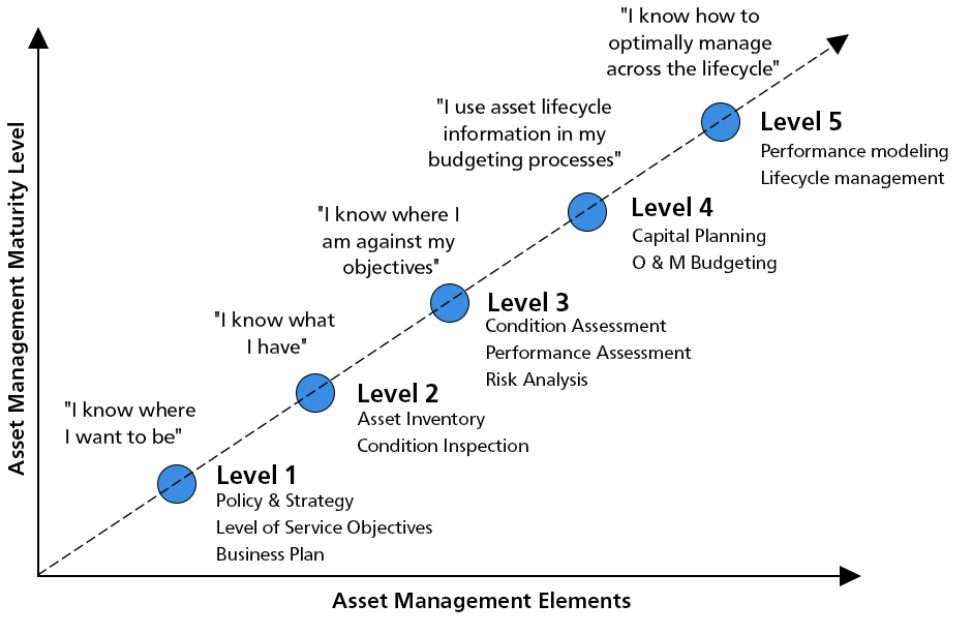
FIGURE A2: A COMPLETE ASSET MANAGEMENT MODEL



Asset Management Maturity Scale

The advancement of the Strategy is measured by the SFMTA's Asset Management Maturity scale shown in Figure A3. The Asset Management Maturity level can be applied at differet 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 A3: 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. 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.

Appendix B: PSD Citywide

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.

PSD Citywide

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, this report describes 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.

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 is at the end of its estimated useful life, PSD Citywide reports the asset in a backlog status. 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 FY2022-23 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. 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 FY2022-23 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.

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. Capital projects are 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 2022-2023 State of Good Repair report is based on 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 2023-24 State of Good Repair report will be based on the most recent CIP, which was passed in April 2024.

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 conditions, and 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.

Appendix C: 2022 TAM Strategic Goals

2022 TAM Strategic Goals

STRATEGIC GOAL	OBJECTIVE	2022-2026 GOALS	TAM Progress
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.	Complete assessments for Traffic Signals and Stations. Develop a plan for future condition assessments prioritizing assets at risk.	Traffic Signals condition assessment completed. Stations condition assessment has been put on hold.
2. Asset Classification Hierarchy	Develop a plan to revise Asset Hierarchy into more SFMTA pertinent classifications and define how FTA classifications fit within SFMTA assets.	Define SFMTA standard asset class hierarchy. Tag each asset to the updated asset class hierarchy. Upload assets to PSD Citywide with new asset classes as well as segments needed for reporting.	Assets have been uploaded to PSD. Adding attributes for reporting and possible further refinement of the hierarchy still ongoing.
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.	Implement EAMS at Scott Center Review EAMS data and work on how to integrate it into PSD Citywide Develop a crosswalk between EAMS and PSD Citywide	Preliminary conversations have begun with IT to develop a crosswalk and will work on a needs assessment in 2024.
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.	Develop a dashboard using PSD Citywide to provide a snapshot of performance for a particular period. Explore if data can be aggregated to see asset data related to High Injury Corridor and Social Equity Neighborhoods.	Preliminary dashboards have been made in Power BI. Efforts to improve update efficiency are on-going.
5. Link TAM Priorities to 20- year Capital Plan and 5-year Capital Improvement Program	Work with FSP 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.	Incorporate TAM Plan goals into the next 20 Year Capital Plan. Continue using the State of Good Repair Report as input in developing the 5-Year Capital Improvement Plan	Capital Budget team used State of Good Repair report data to update 25-29 CIP.

STRATEGIC GOAL	OBJECTIVE	2022-2026 GOALS	TAM Progress
6. Develop Estimates of Ongoing O&M Needs and Costs	Develop estimates of ongoing maintenance needs and costs.	Create a plan to identify needed maintenance and associated costs for each asset in the Capital Asset Inventory.	This is related to goal 3 to help establish a link to maintenance data. If a link cannot be established, maintenance data will need to be extracted and integrated manually.
7. Internal TAM Communication	Implement an internal communication strategy that provides direction and promotes awareness and feedback on TAM policy, processes, and progress towards meeting goals and objectives.	Develop a procedure for reporting to TCC more frequently. Use TCC to initiate further engagement from staff	Re-established asset management group which is a group of asset stakeholders that come together bi-monthly to discuss strategies for how to improve the asset management program
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.	Develop a plan to incorporate the Asset Management Maturity Model into the different asset classes to work towards Level 5.	Not started
9. TAM Training	Identify new training needs and implement ongoing training of staff	Develop a plan for training refresh sessions with new staff across the SFMTA. Continue Asset Management Working Group meetings.	Ongoing
10. PSD Citywide	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.	Upload the entire Capital Asset Inventory to PSD Citywide. Create a new model for asset condition score. Use PSD Citywide functionality to report on data and for dashboards.	Asset inventory uploaded.

Appendix D: NTD Performance Targets

NTD – Transit Asset Management Performance Measure Targets

Each year, NTD performance data are used to apportion over $5 billion of FTA funds to transit agencies in urbanized areas. Transit agencies must report the next fiscal year performance targets to the NTD for assets for which they have capital replacement responsibility. Agencies report on their progress towards achieving a state of good repair for capital assets by submitting condition assessment and performance data. To support TAM planning, the NTD presents this data side-by-side with targets set in the prior year.

Transit agencies must report performance targets for the following categories:

Asset Category	Guidance for calculating and reporting target
Rolling Stock	Percentage of revenue vehicles within a particular asset class that are expected to meet or exceed their Useful Life Benchmark (ULB) Report one target for each vehicle type
Equipment (non-revenue vehicles)	Percentage of service vehicles that are expected to meet or exceed their ULB Report one target for each vehicle type
Facilities	Percentage of facilities with a condition rating expected to rate below 3.0 on the FTA Transit Economic Requirements Model (TERM) scale (1=Poor to 5=Excellent) Report one target for each facility type (Maintenance/Administration, Passenger/Parking)
Infrastructure	Percentage of guideway track miles expected to be operating under performance restrictions, by class Report one target for each rail mode

SFMTA has identified benchmarks for three vehicle types: bus, cable car, and light rail. SFMTA performance against identified benchmarks is described below. SFMTA will continue to identify benchmarks over time.

1.Useful Life Benchmark – Revenue Vehicles

Performance Measure	2023 Target (%)	2023 Performance (%)	2023 Difference
AB - Articulated Bus	0	0	0
AO - Automobile	N/A	N/A	N/A
BR - Over the road Bus	N/A	N/A	N/A
BU - Bus	13	4.51	-8.49
CC - Cable Car	0	78.95	78.95
CU - Cutaway	0	0	0
DB - Double Decker Bus	N/A	N/A	N/A
LR - Light Rail	0	17.89	17.89
MV - Minivan	N/A	0	
OR - Other	N/A	N/A	0
SB - School Bus	N/A	N/A	N/A

Revenue vehicles have historically been the focus of SFMTA capital investment, accounting for our low ULB percentage in most categories. SFMTA has made great progress in keeping its motorcoach bus fleet within its useful life benchmark with 4.51% past its useful life with procurement of new vehicles arriving in the coming years. Similarly, light rail vehicles are in a State of Good Repair. Old Breda light rail vehicles will be retired when the new Siemens vehicles arrive. The Cable Car useful life benchmark is determined by percentage of fleet beyond the significant rehabilitation cycle. At current SFMTA resource levels, the agency can only rehabilitate two cable cars a year. The Historic Streetcars useful life benchmark is calculated based on the percent of fleet not available for revenue service.

Useful Life Benchmark – Non-Revenue Vehicles

Performance Measure	2023 Target (%)	2023 Performance (%)	2023 Difference
Automobiles	32	36.90	3.90
Trucks and other Rubber Tire Vehicles	13	17.62	4.62
Steel Wheel Vehicles	N/A	N/A	

SFMTA continues to advocate for resources to maintain SGR in the non-revenue fleet. While SFMTA did not reach the target percentage of non-revenue vehicles beyond their useful life, the actual performance is less than five percentage points away from the target. Identifying funding for non-revenue vehicles is challenging because they are transit critical. Given the rising cost of vehicles and legislatively mandated fleet electrification, maintaining the vehicle fleet in a state of good repair is likely to become increasingly expensive.

Appendix E: Asset Class Pages

Facilities

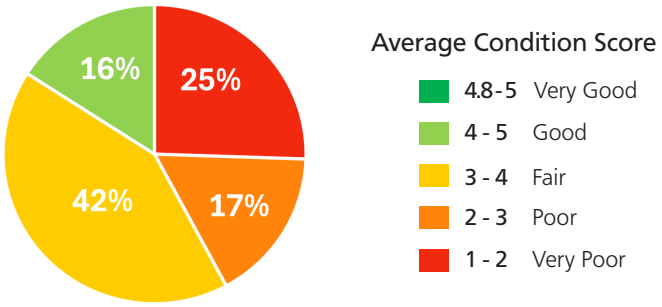
Introduction

The facilities asset class includes different buildings, outdoor areas, and bus yards. These places help the SFMTA run transit services by maintaining busses, trains and infrastructure.

Projects

Kirkland Bus Maintenance Facility Upgrade: Facility will be renovated and upgraded to support battery electric buses. The facility will be repaved, include an new bus wash, upgraded maintenance and operating buildings and required electrical infrastructure and chargers to support battery electric buses.

Condition Analysis



SFMTA records show that **68% of facility assets are currently in a state of good repair**, with scores above 2.5. However, a significant portion of assets fall into the Poor to Very Poor categories, highlighting the need for urgent investment. Critical facilities, such as the Presidio and Portrero Bus Divisions, are among those in poor condition.

Facility	Condition
Burke Storage Facility	4.3
Duboce Yard	4.0
Transportation Management Center	4.0
Islais Creek	3.7
Operator Restrooms	3.5
Muni Metro East Rail Division	3.3
Scott Non-Revenue Facility	2.8
Cameron Beach	2.8
Green Maintenance Facility	2.7
700 Pennsylvania Maintenance Facility	2.6
Cable Car Barn	2.5
Flynn	2.4
OHL_Maintenance Facility	2.4
Woods Bus Division	2.4
Power Control Center	1.9
Lenox Office	1.8
Kirkland Bus Division	1.7
Potrero Bus Division	1.7
Presidio Bus Division	1.2
Lenox Office	1.2

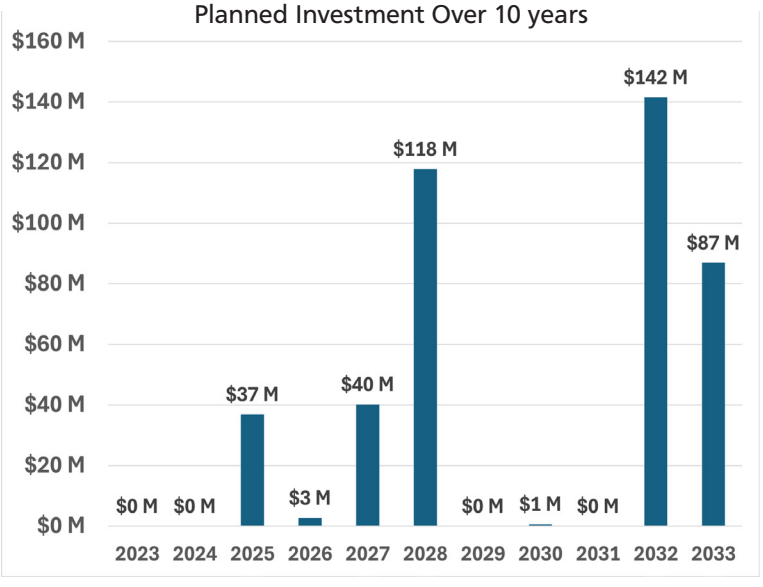
Recommendations

Present

The Facilities asset class has a **$1 billion backlog of buildings and equipment that are past their expected lifespan**. Although these assets aren't transit-critical, they are important. Many employees work in these facilities, which support the entire transit system.

Future

Funding will be needed at key times when certain assets reach the end of their useful life. For example, in 2028, the Woods Bus Division will need a new bus washer, lifts, and exterior repairs. In 2032, parts of the Islais Creek facility will also need maintenance or replacement. In 2033, several operator restroom roofs will need to be fixed to avoid adding them to the backlog.



Overhead

Introduction

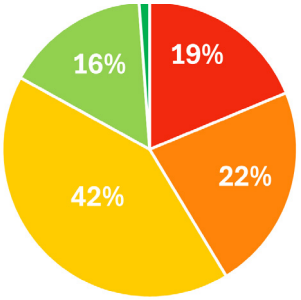
Overhead lines are used to transmit power to support electrically powered trolley coaches, light rail vehicles, and historic streetcars.

Projects

Islais Creek Bridge Overhead Reconstruction: Design and replace the overhead wiring system, including its support structures, as part of the San Francisco Public Works project to rebuild the Islais Creek bridge.

Rigid Traction Power Feasibility Study: Study whether upgrading the current overhead wiring system to a Rigid Overhead Conductor Rail System is possible and beneficial. The study will include recommendations, costs, and initial design work for the new system.

Condition Analysis



Average Condition Score

- 4.8-5 Very Good
- 4 - 5 Good
- 3 - 4 Fair
- 2 - 3 Poor
- 1 - 2 Very Poor

Element	Condition
Decorative Streetlight	4.9
Misc Overhead	4.9
Ductbank	3.9
Manhole	3.8
Other than OCS Ductbank/Manhole	3.7
Poles and Foundation	3.6
Pole Grounding	3.3
Decorative Streetlighting	3.1
Tangent Span	2.3
Feed Span (+ and -)	2.2
Trolley Wire	2.0

Currently, **71% of overhead assets are in a state of good repair**, with scores above 2.5. However, key parts like trolley wires and feed spans are in poor shape. This could cause major service problems if not fixed soon. While decorative streetlights are in very good condition, many other assets are in the fair range, and could soon drop below a state of good repair.

Recommendations

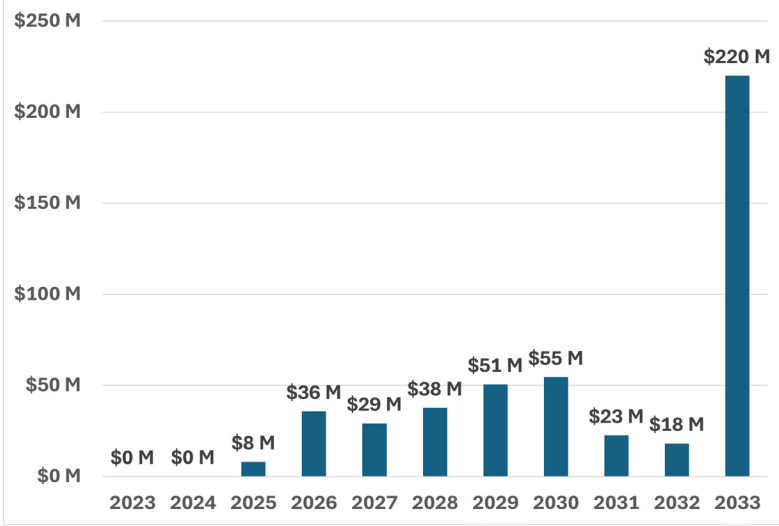
Present

Currently **Overhead assets have a $820 million dollar backlog.** Many transit-critical assets, such as trolley wires along Church Street, Market Street, and Junipero Serra are in the backlog. These are essential for streetcar lines like the J Church and others.

Future

Over the next ten years, overhead assets will need steady funding, starting in 2025. Replacement and maintenance will cost between $40-$60 million each year. In 2033, a larger number of assets will need to be replaced. These include trolley wires, overhead catenary, and decorative street lighting.

Planned Investment Over 10 years



Train Control and Communication

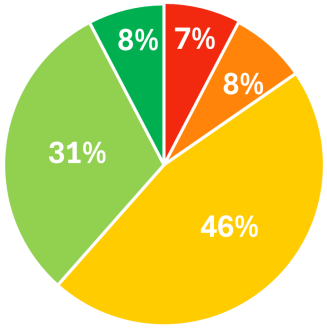
Introduction

The SFMTA's train control system helps improve Muni Metro light rail service by giving staff the tools they need to provide reliable, fast, and frequent transit to and within downtown San Francisco

Projects

Train Control System Upgrade: Plan, design, procure and install the next-generation communications- based train control (CBTC) system for the rail network, covering both surface and subway routes. The first phase will install CBTC on the Embarcadero and Third Street corridors, and the second phase will replace the current system in the Market Street and Central Subways. Over the next nine years, CBTC will also expand to the surface routes of the J, K, L, M, N, and T lines. Design is set to begin in January 2025, with construction starting in spring 2026.

Condition Analysis



Average Condition Score

4.8 - 5	Very Good
4 - 5	Good
3 - 4	Fair
2 - 3	Poor
1 - 2	Very Poor

Element	Condition
Cable Transmission System	4.2
CS-IT Backbone Network	4.2
Passenger Communication	4.2
Radio	3.5
Passenger Communications Systems	3.4
Cable Transmission System (CTS)	3.2
Safety and Security	3.2
SCADA	2.8
Centralized Train Control	1.0

Currently, **92% of train control and communication system assets are in a state of good repair**, with scores above 2.5. The upcoming Train Control System Upgrade will be a major improvement for this asset class.

Recommendations

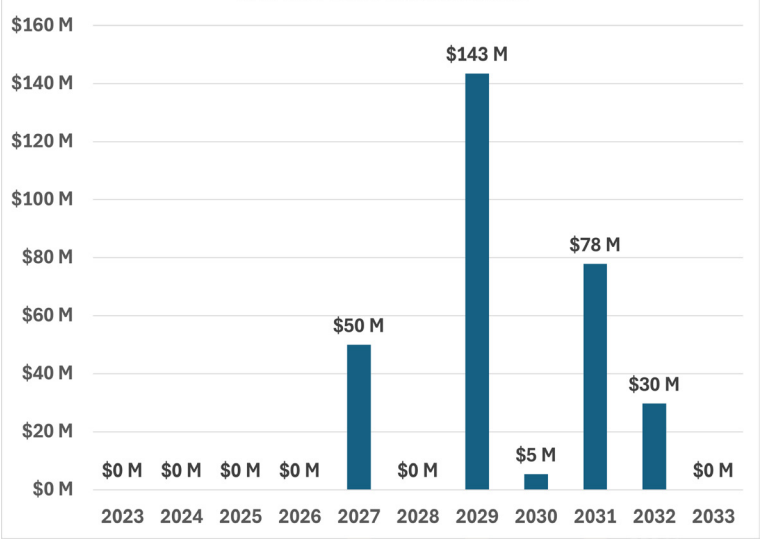
Present

Train control and communications have a backlog of $330 M and are moving forward with the installation of the new CBTC system.

Future

The Train Control System Upgrade is not yet part of this strategy has begun implementation in 2023. Other smaller investments will be needed down the line for other Train Control asset maintenance.

Planned Investment Over 10 years



Light Rail Vehicles

Introduction

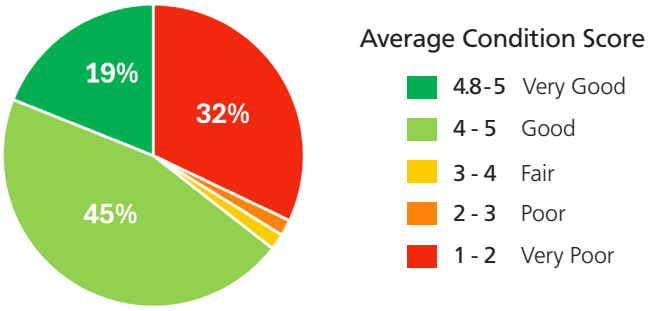
Muni's light rail vehicles run 21 hours a day, 365 days a year, serving 49 million riders each year. The fleet includes LRV2, LRV3, and the newest LRV4 models. Muni also operates three types of historic streetcars.

Projects

Light Rail Vehicle Fleet Replacement & Expansion: Purchase 151 new light rail vehicles (LRVs) to replace aging trains. Buy 68 additional LRVs to expand the fleet to 219. The older LRV2 and LRV3 models, made by Breda, are reaching the end of their lifespan. The new LRV4 models, built by Siemens in California, will support the Central Subway and increase service across the city. These trains will improve reliability, safety, and comfort for riders.

Paratransit Fleet Expansion: Add more paratransit vehicles to keep up with growing service demand. Planning ahead will ensure paratransit services remain reliable and comfortable for riders.

Condition Analysis



Vehicle Type	Condition
Historic Street Car	4.1
LRV	3.2

Our records show that **68% of light rail vehicles (LRVs) are in a state of good repair**, with condition scores of 3 or higher. However, 32% are in Very Poor condition and need urgent investment. SFMTA has made progress by adding 34 new trains this year and 20 last year, but many older trains still need attention. Ongoing investment in new trains and maintenance is key to keeping service reliable.

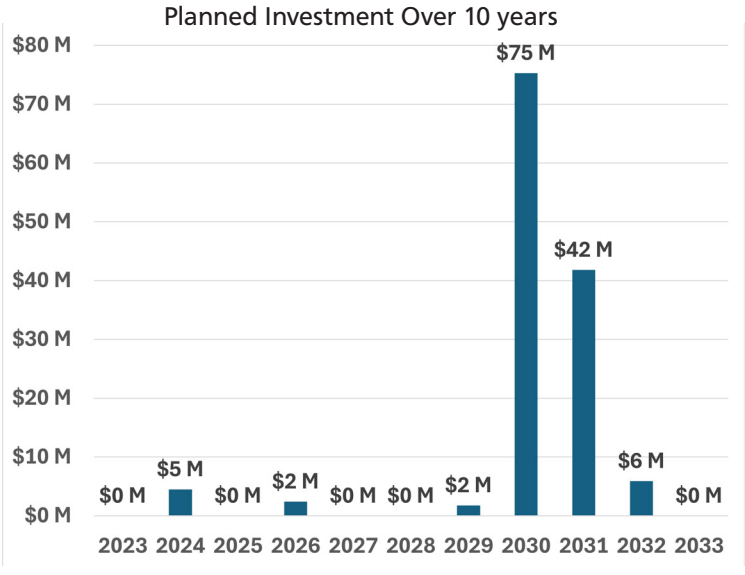
Recommendations

Present

Light Rail Vehicles have a $448 million backlog, with 32% of the fleet not in a state of good repair. We will need to continue maintaining and replacing trains that are in the backlog.

Future

The funding plan shows major investments are needed in 2030 and 2031, with $75 million and $42 million required for midlife overhauls. In 2030, 41 Siemens light rail vehicles will need overhauls, and 22 more will need them in 2031.



Motor Coach

Introduction

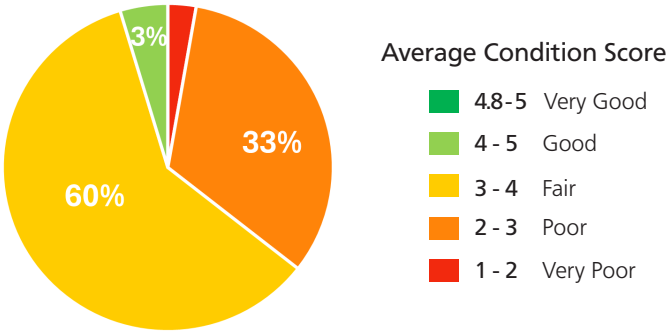
The motor coach fleet consists of low emissions electric hybrid motor coaches that run on battery and renewable diesel. The fleet consists of 33 30-foot, 322 40-foot, and 224 60-foot vehicles.

Projects

Planned Maintenance: Perform regular maintenance on 40' and 60' motor coaches and trolley coaches. Data shows that maintaining the fleet improves reliability, reduces breakdowns, and prevents costly repairs and service disruptions.

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

Condition Analysis



Element	Condition
Motorcoach 40ft	3.3
Motorcoach 60ft	3.0
Motorcoach 30ft	2.9

Our records show that **96% of motor coach vehicles are in a state of good repair**, with condition scores of 2.5 or higher. However, many are in the 2-3 range, meaning they will need investment soon to avoid joining the backlog.

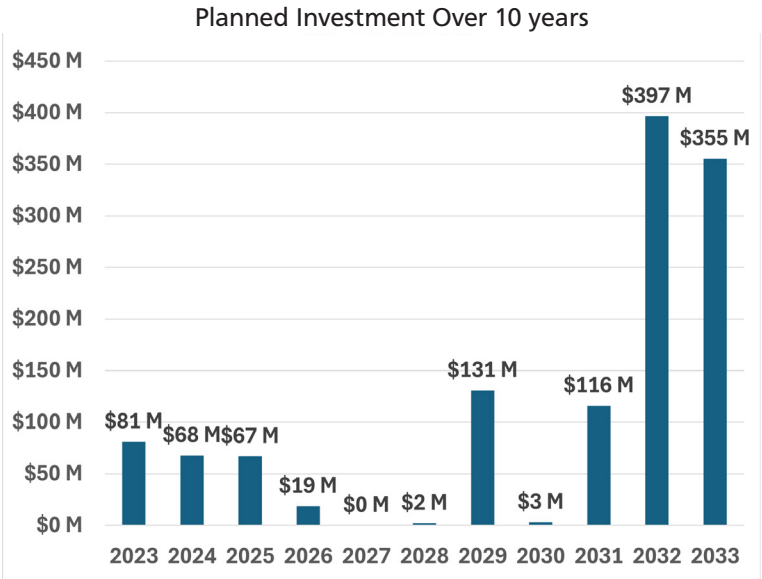
Recommendations

Present

There is currently a **backlog of $32 million** for motor coach vehicles that needs to be addressed. While 20 new motor coaches were added in 2023 and 4 more in 2024, some older buses still require attention. Ongoing investment in maintenance and replacement is essential to ensure reliable service.

Future

The SFMTA will need to make major investments in 2032 and 2033, with $397 million and $355 million required to replace aging motor coach vehicles during those years.



Trolley Coach

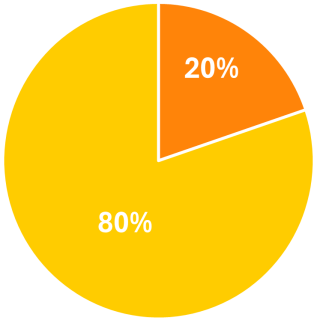
Introduction

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

Projects

Planned Maintenance: **Planned Maintenance**: Perform regular maintenance on 40' and 60' motor coaches and trolley coaches. Data shows that maintaining the fleet improves reliability, reduces breakdowns, and prevents costly repairs and service disruptions.

Condition Analysis



Average Condition Score

- 4.8-5 Very Good
- 4 - 5 Good
- 3 - 4 Fair
- 2 - 3 Poor
- 1 - 2 Very Poor

Vehicle Type	Condition
40 Ft Subfleet	3.7
60 Ft Subfleet	3.1

Our records show that while **100% of trolley coach vehicles are currently in a state of good repair** but most are in the fair range. This means many of the 40-foot and 60-foot vehicles will need attention soon.

Recommendations

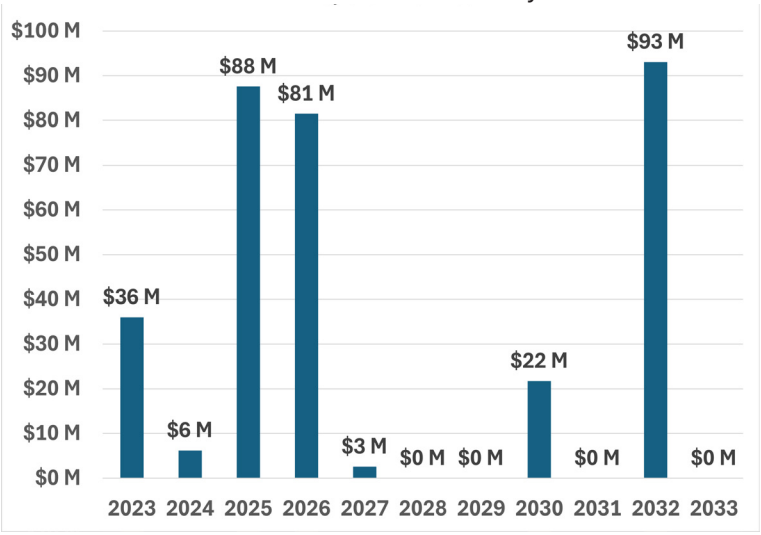
Present

Although there is **no current backlog for trolley coach vehicles**, addressing upcoming maintenance needs is crucial to prevent wear and tear that could cause service disruptions. Trolley coaches are essential to San Francisco's electric transit system, so staying on track with maintenance and replacements is key to providing safe, reliable, and environmentally friendly service. The last addition to the fleet was 4 new vehicles in 2020. Continuing proactive maintenance now will extend the life of these vehicles and help prevent future disruptions.

Future

The funding plan shows a need for significant investments in 2025 and 2026, with $88 million and $81 million set aside for midlife overhauls of trolley coaches. These years are important as many vehicles will need major maintenance. Another $93 million will be needed in 2032 for further replacements.

Planned Investment Over 10 years



Stations

Introduction

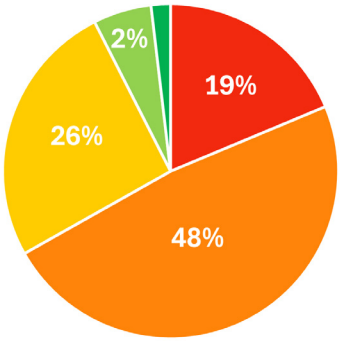
The Muni Metro system includes three tunnels, nine subway stations, and 142 surface platforms and boarding islands.

Projects

Station Wayfinding Signage and Upgrade Phase IV: Upgrade signage at West Portal, Forest Hill, Van Ness, Civic Center, Montgomery, and Embarcadero stations. This includes designing, purchasing, and installing new wayfinding and station signs.

Embarcadero Upgrade Project: Replace four escalators at Embarcadero, one at a time, to keep the others in operation. Renovate operator restrooms at the platform level to include an ADA-accessible stall, two standard stalls, and new fixtures and ventilation.

Condition Analysis



Average Condition Score

- 4.8-5 Very Good
- 4 - 5 Good
- 3 - 4 Fair
- 2 - 3 Poor
- 1 - 2 Very Poor

Station	Condition
Chinatown Light Rail Station	4.9
Union Square Light Rail Station	4.9
Yerba Buena Light Rail Station	4.9
Duboce and Church	4.1
Phelan Loop	4.1
Balboa Park Station	3.4
Glen Park Station	2.8
Muni Metro East Rail Division	2.6
Forest Hill Light Rail Station	2.1
Van Ness Light Rail Station	2.0
West Portal Light Rail Station	2.0
Castro Light Rail Station	2.0
Church Light Rail Station	2.0
Montgomery Light Rail Station	1.9
Civic Center Light Rail Station	1.9
Powell Light Rail Station	1.9
Embarcadero Light Rail Station	1.7

Currently, **79% of stations are in a state of good repair,** with scores above 2.5. However, several are in poor condition and need immediate attention. Key locations like Powell and Embarcadero Light Rail Stations are in particularly bad shape. This may risk major service interruptions if not addressed soon. While newer stations such as Chinatown and Union Square are in excellent condition, many others are fair rating and could decline without more investment.

Recommendations

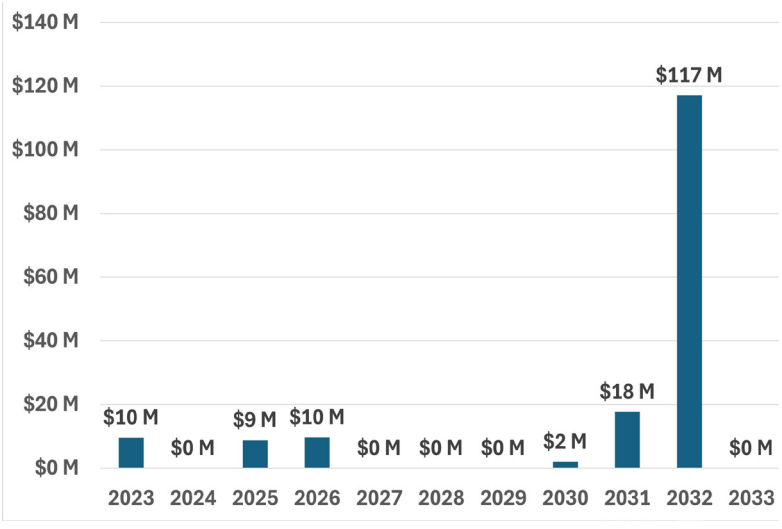
Present

With a current **backlog of $684.6 million** in station repairs, it is crucial to address these needs promptly to prevent further deterioration that could disrupt service.

Future

This funding plan shows that SFMTA needs to make significant investments in 2025 and 2026, with $9 million and $10 million allocated to platform station upgrades. $18 million will be needed in 2031 for Electronic signage replacements. Additionally, another $117 million will be needed in 2032 for replacement of station fire alarms.

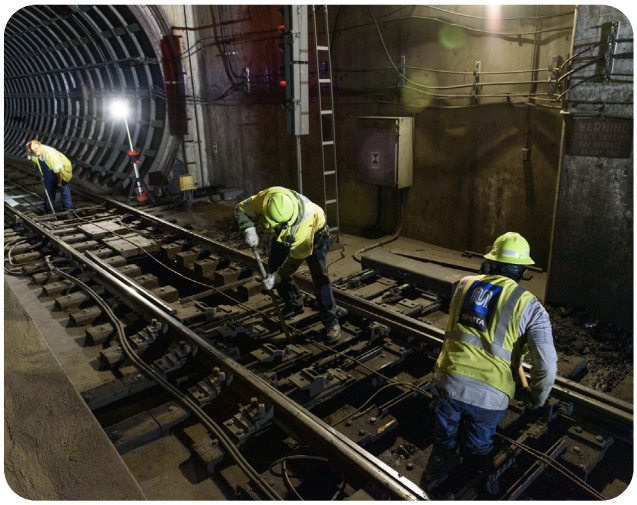
Planned Investment Over 10 years



Track

Introduction

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.



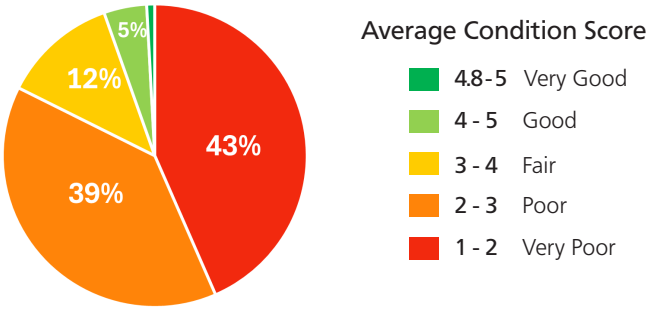
Projects

Cable Car Guideway State of Good Repair (SGR) Program: Improve cable car system reliability and vehicle safety to enhance the rider experience while preserving this historic asset in active service.

Subway Special Trackwork Replacement: Replace special track components, like switches and crossovers, at Castro, Duboce, Van Ness, and Embarcadero Stations.

Subway Trackwork Replacement: Replace straight and curved rail segments between Embarcadero and Castro Stations.

Condition Analysis



Element	Condition
Central Subway	4.9
Subway	4.6
Green	4.2
T	3.2
M	3.0
N	3.0
K	2.8
MME	2.7
L	2.5
F	2.4
J	2.3
Powell-Hyde	2.2
Powell-Mason	2.2
Muni Metro	2.2
California	2.2
Geneva	1.9
Geneva Yard	1.9
Embarcadero	1.8

Currently, **40% of the track assets are in a state of good repair**, as many are in poor shape and need urgent repairs. Key areas like Embarcadero are particularly at risk of causing service disruptions. While newer sections like the Central Subway are in excellent condition, others could quickly worsen without maintenance. Timely repairs are crucial to keeping the system running smoothly.

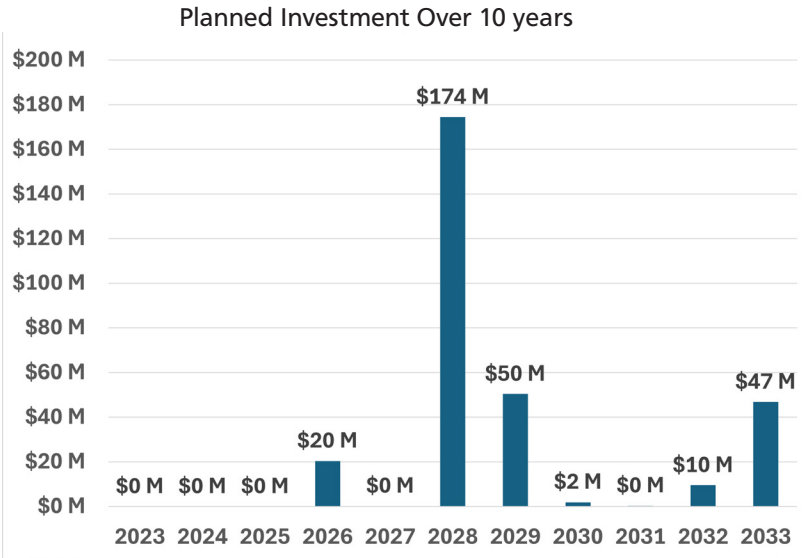
Recommendations

Present

With a current backlog of $337 million in track repairs, it's crucial to address these needs promptly to prevent further deterioration and potential service disruptions.

Future

The funding plan shows the need for major investments in track maintenance and upgrades. In 2026, $20 million is allocated for the Sunset and Market Street tunnels. In 2028, $174 million is needed to replace a large section of Direct Fixation Turnout MME, along with track replacements on the K, J, and M lines. An additional $50 million will be needed in 2029 for non-revenue track replacements, followed by $47 million in 2033 for improvements along the N Judah line



Parking and Traffic

Introduction

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.

Projects

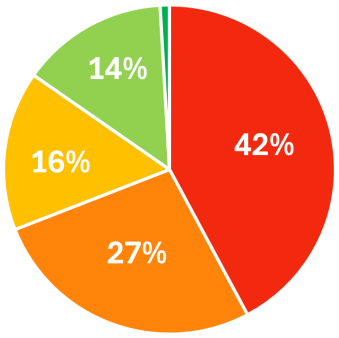
Contract 36 Traffic Signal Modifications: Upgrade signals at 14 intersections citywide, including pedestrian countdown signals, mast-arm signals, and left-turn signals. Construction starts in early 2024.

Contract 66 New Traffic Signals: Install new signals or flashing systems at 11 intersections. Project will be advertised in 2024.

Tenderloin Signal Upgrade: Improve signals at 11 intersections in the Tenderloin. Design is ongoing, with construction planned for 2025.

Western Addition Traffic Signals Phase 1: Upgrade signals at 16 intersections. Construction is expected to finish in 2024.

Condition Analysis



Average Condition Score

4.8-5	Very Good
4 - 5	Good
3 - 4	Fair
2 - 3	Poor
1 - 2	Very Poor

Element	Condition
Central Revenue Collection	3.8
Red Lane	2.8
Elevators	2.5
Signal	2.5
In-Station	2.4
ITS	2.1
Green Lane	2.0
Parking	2.0

Currently, **39% of parking and traffic assets are in a state of good repair,** with scores above 2.5, but a significant portion is in poor condition, requiring urgent investment. Of those in bad condition are parking garages and aging signals.

Recommendations

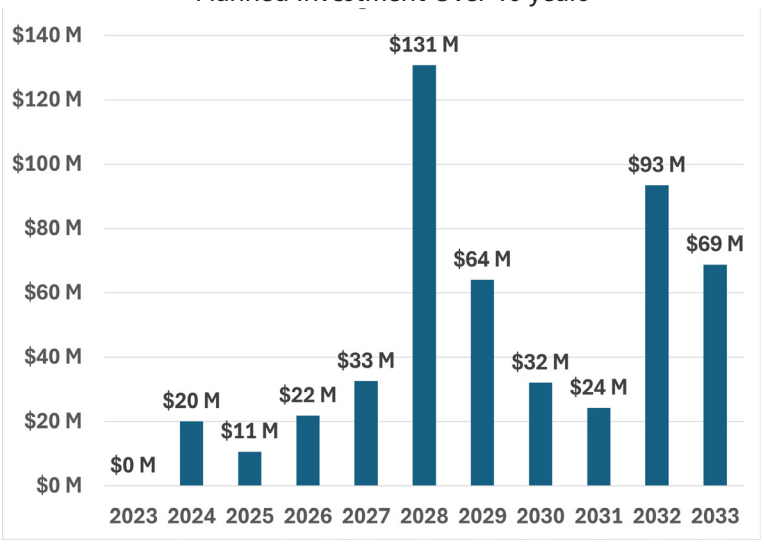
Present

There is a **$1.13 billion backlog for parking and traffic assets,** mainly due to aging signals critical for managing traffic flow. Timely investments in garage upgrades and signal repairs are needed to reduce the backlog and keep the city's transportation network reliable.

Future

The plan calls for $131 million in 2028 for parking garage electrical updates, bike lanes, and CCTV replacements. Additional investments of $93 million in 2032 and $69 million in 2033 will address garage infrastructure, bikeway maintenance, and signal replacements.

Planned Investment Over 10 years



Other Systems and Vehicles

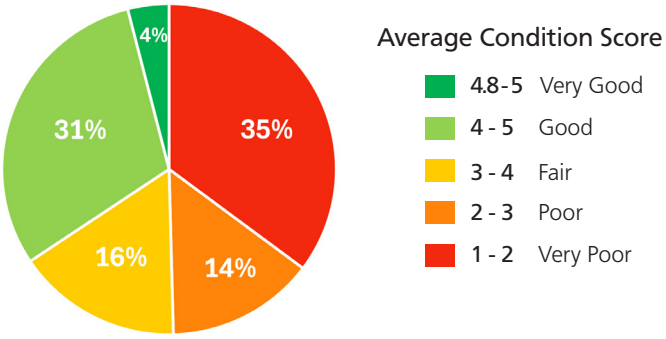
Introduction

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.

Projects

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.

Condition Analysis



Element	Condition
Guideway	3.8
Non-Revenue Vehicles	3.2
Revenue Collection	3.0
Buildings	2.8
Utilities	2.8
Communications	2.6
Substations	2.5
Revenue Vehicles	2.4
ITS	2.3
Equipment	2.1
Special Structures	1.7
Specialized IT	1.1
Equipment Vehicles	1.0

Our records indicate that **60% of other systems and vehicles are in a State of Good Repair** While 34% of assets, including non-revenue vehicles, are in good shape, a number of key systems, such as buildings, revenue collection, and utilities, are rated as fair, meaning they are at risk of further deterioration. To maintain operational efficiency and avoid disruptions, regular maintenance and timely upgrades will be crucial for these assets.

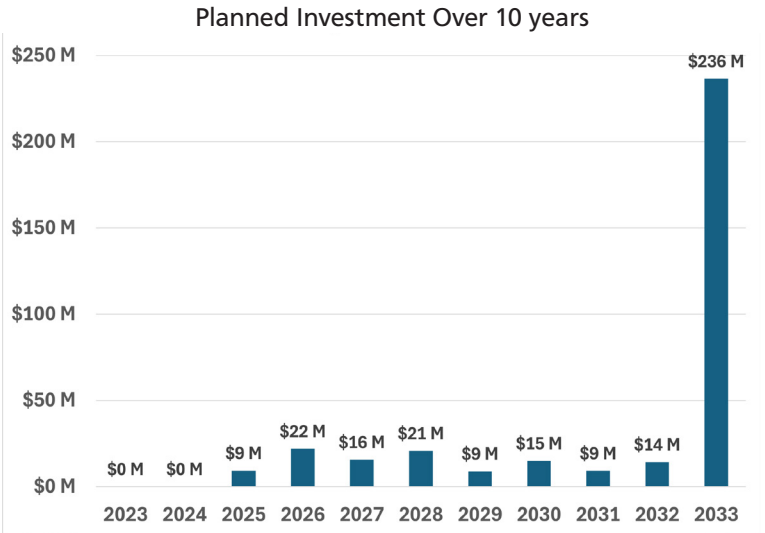
Recommendations

Present

There is a $333.1 million backlog for other systems and vehicles, including key components such as equipment and revenue vehicles that are in poor condition.

Future

The funding plan also forecasts a significant spike in 2033, with $236 million needed for upgrades. These upgrades will primarily target fare collection systems, including on-vehicle fare boxes, as well as IT network assets. Additionally, a large number of non-revenue vehicles, such as pickup trucks, carts, and vans, will require replacement that year. Addressing these needs is essential to ensure the continued functionality and efficiency of SFMTA's operations.



SFMTA

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