SFMTA
Municipal
Transportation
Agency

Municipal Transportation Quality Review

Fiscal Years 2015-2016

FINAL

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Executive Summary

The San Francisco City Charter mandates a biennial, independent, quality review of transit operations performance. The quality review consists of three elements: review of data collection and reporting methods, analysis of trends in reported data, and auditor recommendations. This report is the eighth independent review of Muni's performance. It covers Fiscal Years 2015 and 2016 (July 1, 2015 through June 30, 2016).

The biennial quality review has been conducted with the following goals in mind:

- Help the SFMTA assess Muni's progress toward its goals and objectives
- Evaluate Muni's established goals and performance against the letter and intent of the San Francisco City Charter and FY 2013 – 2018 Strategic Plan
- Assess whether specific implementation goals, methods, and definitions of measurement are appropriate or could be improved
- Provide independent verification to the public that Muni is on track by auditing Muni's data collection and analysis procedures

2015-2016 Quality Review and the Transit Management Center (TMC)

Each cycle, an independent review is conducted on a specialized topic. This year, the team reviewed the SFMTA's plans for quality control as a new state-of-the-art Transit Management Center comes online, replacing the Operations Control Center (OCC).

In this report

Subsequent chapters cover:

- Chapter 1 Historical Context
- Chapter 2 Methodology
- Chapter 3 Analysis of Performance Metrics
- Chapter 4 Operational Analysis
- Appendix A Glossary of Terms

METRICS

This is the second audit cycle in which the metrics and targets come from the FY 2013-2018 Strategic Plan.

This report reviews metrics related to transit-based objectives in the San Francisco City Charter or FY 2013 – 2018 Strategic Plan are included in this report. The metrics audited for this report are listed in Figures ES-1 – ES-4 below, grouped by Strategic Plan goal. Metrics serving as Key Performance Indicators are noted in the following tables. Goals are set for each fiscal cycle and are posted on the SFMTA website in interactive reports that allow the public to drill down on details they may care about.

Figure ES-1 Goal 1: Create a safer transportation experience for everyone

Metric	Strategic Plan Metric	Key Performance Indicator
SFPD-Reported Muni-related crimes/100,000 miles	1.1.1	■
Customer Rating: Security of Transit Riding Experience (while on Muni vehicle or waiting at stop or station)	1.1.2	
Security Complaints to 311 (Muni)	1.1.4	
Workplace Injuries/200,000 hours	1.2.1	■
Security Incidents Involving SFMTA Personnel (Muni Only)	1.2.2	
Muni Collisions/100,000 Miles	1.3.1	■
Muni Falls On Board/100,000 Miles	1.3.3	
"Unsafe Operation" Muni Complaints to 311	1.3.4	
Customer Rating: Safety of Transit Riding Experience	1.3.5	

Figure ES-2 Goal 2: Make transit, walking, bicycling, taxi, ridesharing & carsharing the preferred means of travel

Metric	Strategic Plan Metric	Key Performance Indicator
Customer Rating: Overall Customer Satisfaction with Transit Services	2.1.1	■
Customer Rating: Communications to Passengers	2.1.5	
Percentage of Actionable 311 Muni-related Complaints Addressed within 28 Days	2.1.7	
Customer Rating: Cleanliness of Muni Vehicles	2.1.8	
Customer Rating: Cleanliness of Muni Facilities (Stations, Elevators, Escalators)	2.1.9	
Percentage of Transit Trips with < 2 Minute Bunching on Rapid Network	2.2.1	■
Percentage of Transit Trips with +5 Minute Gaps on Rapid Network	2.2.1	
Percentage of On-Time Performance for Non-Rapid Network Routes	2.2.2	
Percentage of Scheduled Service Delivered (Trips)	2.2.3	
Percentage of On-Time Departures from Terminals	2.2.4	
On-Time Performance	2.2.6	
Percentage of Trips Over Capacity During AM and PM Peaks (8:00a-8:59a, Inbound, 5:00p-5:59p, outbound) at max load point	2.2.7	
Mean Distance Between Failure	2.2.8	
Percentage of Scheduled Service Hours Delivered	2.2.9	
Ridership (Bus, Average Weekday)	2.2.11	
Ridership (Metro, Average Weekday)	2.2.12	
Operational Availability of Elevators and Escalators	2.2.12, 2.2.13	

Figure ES-3 Goal 3: Improve the environment and quality of life in San Francisco

Metric	Strategic Plan Metric	Key Performance Indicator
Estimated Economic Impact of Muni Service Delays	3.2.1	■
Average Annual Transit Cost Per Revenue Hour	3.4.1	■
Passengers Per Revenue Hour For Buses	3.4.2	
Cost Per Unlinked Trip	3.4.3	
Farebox Recovery Ratio	3.4.5	

Figure ES-4 Goal 4: Create a workplace that delivers outstanding service

Metric	Strategic Plan Metric	Key Performance Indicator
Employee Satisfaction	4.2.1	■
Unscheduled Absence Rate for Transit Operators	4.3.3	

TRENDS

Between FY 2015 and FY 2016, Muni made improvements in important areas of reliability, customer service, and technology upgrades. The technology upgrades during and after this audit cycle aimed to improve timely and accurate data entry, incident location recording, automated workflows, and incident investigation processing. Overall, the auditors found that data reported by Muni appeared to be reliable. While data reporting has become easier with technology, data collection efforts are still a challenge for some metrics—discussed in Chapter 2 – Methodology.

Trends of each metric are presented in Figures ES-5 – ES-8 below, categorized by Strategic Plan goal and audit period change. If a metric reports all modes, when one mode improved while another fell during the audit cycle, they are shown as separate items.

Trend Ratings	✓ Positive Trend	X Negative Trend	○ Neutral Trend

Figure ES-5 Trends of Goal 1 Metrics: Create a safer transportation experience for everyone

Strategic Plan Metric	Metric Description	Audit Period Trend	FY 2015	FY 2016
1.1.1	SFPD-Reported Muni-related crimes/100,000 miles	✓	8.2	6.4
1.1.2	Customer Rating: Security of Transit Riding Experience (while on Muni vehicle)	✓	3.3	3.4
1.1.2	Customer Rating: Security of Transit Riding Experience (while waiting at stop or station)	○	3.2	3.2
1.1.4	Security Complaints to 311 (Muni)	✓	37.2	28.8
1.2.1	Workplace Injuries/200,000 Hours	X	11.0	12.8
1.2.2	Security Incidents Involving SFMTA Personnel (Muni Only)	X	8.3	12.8
1.3.1	Muni Collisions/100,000 Miles	X	6.4	6.6
1.3.3	Muni Falls On Board/100,000 Miles	○	4.4	4.4
1.3.4	"Unsafe Operation" Muni Complaints to 311	X	179.6	183.5
1.3.5	Customer Rating: Safety of Transit Riding Experience	✓	3.7	3.8

Figure ES-6 Trends of Goal 2 Metrics: Make transit, walking, bicycling, taxi, ridesharing & carsharing the preferred means of travel

Strategic Plan Metric	Metric Description	Audit Period Trend	FY 2015	FY 2016
2.1.1	Customer Rating: Overall Customer Satisfaction with Transit Services	✓	3.1	3.2
2.1.5	Customer Rating: Communications to Passengers	✓	2.8	2.9
2.1.7	Percentage of Actionable 311 Muni-Related Complaints Addressed within 28 Days	X	90%	58%
2.1.8	Customer Rating: Cleanliness of Muni Vehicles	✓	2.7	2.9
2.1.9	Customer Rating: Cleanliness of Muni Facilities (Stations, Elevators, Escalators)	X	2.6	2.5
2.2.1	Percentage of Transit Trips with <2 Minute Bunching on Rapid Network	X	4.8%	5.4%
2.2.1	Percentage of Transit Trips with >5 Minute Gaps on Rapid Network	✓	17.2%	16.9%
2.2.2	Percentage of On-Time Performance for Non-Rapid Network Routes	✓	57.4%	60.5%

Strategic Plan Metric	Metric Description	Audit Period Trend		FY 2015	FY 2016
2.2.3	Percentage of Scheduled Service Delivered (Trips)	✓		97.7%	98.9%
2.2.4	Percentage of On-Time Departures from Terminals	✓		72.7%	75.3%
2.2.6	On-Time Performance	✓		57.0%	59.8%
2.2.7	Percentage of Trips Over Capacity During AM and PM Peaks (8:00a-8:59a, Inbound, 5:00p-5:59p, Outbound) at Max Load Point	✓	AM	4.3%	3.0%
			PM	4.9%	3.3%
2.2.8	Mean Distance Between Failure: Bus	X		5,802	5,596
2.2.8	Mean Distance Between Failure: Historic Streetcar	✓		1,866	2,076
2.2.8	Mean Distance Between Failure: Cable Car	✓		8,521	8,918
2.2.8	Mean Distance Between Failure: LRV	✓		4,618	5,672
2.2.9	Percentage of Scheduled Service Hours Delivered	✓		97.7%	99.0%
2.2.11	Ridership (Bus, Average Weekday)	✓		500,981	504,558
2.2.11	Ridership (Metro Faregate Entries, Average Weekday)	X		73,811	69,515
2.2.12	Percentage of Days Elevators are in Full Operation	✓		93.3%	94.5%
2.2.13	Percentage of Days Escalators are in Full Operation	X		91.9%	86.5%

Figure ES-7 Trends of Goal 3 Metrics: Improve the environment and quality of life in San Francisco

Strategic Plan Metric	Metric Description	Audit Period Trend	FY 2015	FY 2016
3.2.1	Estimated Economic Impact of Muni Service Delays	✓	$1.9M	$1.65M
3.4.1	Average Annual Transit Cost per Revenue Hour	X	$227.69	$229.37
3.4.2	Passengers per Revenue Hour for Buses	X	64.0	63.0
3.4.3	Cost per Unlinked Trip	X	$3.29	$3.38
3.4.5	Farebox Recovery Ratio	X	30%	26%

Figure ES-8 Trends of Goal 4 Metrics: Create a workplace that delivers outstanding service

Strategic Plan Metric	Metric Description	Audit Period Trend	FY 2015	FY 2016
4.2.1	Employee Satisfaction	○	3.4	3.4
4.3.3	Unscheduled Absence Rate by Transit Operators	X	7.7%	8.6%

RECOMMENDATIONS

Auditor recommendations focus on ways to further refine or improve performance reporting to make it more relevant to the SFMTA and the public, or on ways to improve performance in areas where Muni has not yet met its goals. Although the recommendations focus on the two-year audit period ending on June 30, 2016, they may reflect any developments that have been made since that time. The recommendations are reviewed with SFMTA staff to ensure that they are in line with current budget and resource constraints. The following section summarizes general and measure-specific recommendations, which are discussed in more detail in Chapter 3.

IMPLEMENTED FROM THE LAST AUDIT

Recommendations SFMTA has implemented since the FY 2013 – 2014 quality review audit include:

- **Redefined the term "Rapid."** Strategic Plan Metric 2.2.1 Percentage of transit trips with <2 minute bunching or +5 minute gaps on the Rapid Network is more intuitive for the public now that the term has been changed.
- **Improved documentation available to the public.** The SFMTA has added Interactive Dashboards at www.sfmta.com/performance that include descriptions of each measure for all key performance indicators.
- **Removed metrics 2.2.5 Average Muni Speed and 3.4.4 Pay to Platform Hours Ratio**. In the case of average Muni speed, the SFMTA was unable to report on the metric, but if it is reinstituted in the future, the SFMTA should consider tracking the key corridors with the Rapid Bus network. Pay to platform was removed because other metrics better encapsulate the goals set forth in the City Charter of San Francisco and the FY 2013 – 2018 Strategic Plan.

CURRENT RECOMMENDATIONS

General

- Muni should take care to denote methodological changes that happen mid-cycle and leave out historical trend data when appropriate if definitions have changed in ways that impact comparability of data over time.
- Continue making improvements to the Operations Control Center (OCC) data management system and process controls to simplify performance data sharing, processing, and analysis.
- Formalize standard operating procedures as new technologies come online. Adopt data governance policies to ensure smooth transitions from older legacy data systems to newer technologies and ensure consistent and acceptable uses of data.

Measure-Specific

1.1.1 SFPD-reported Muni-related crimes/100,000 miles

- Establish a protocol for regularly receiving crime data from SFPD on a regular basis.

1.1.2 Customer rating: Security of transit riding experience while on a Muni vehicle or waiting at a stop or station

- Replace the quarterly panel survey with the annual rider survey.

1.1.4 Security Complaints to 311 (Muni)

- Normalize complaint metrics to mileage, boardings or service hours.

1.2.2 Security incidents involving SFMTA personnel (Muni only)

- Develop a standard operating procedure to ensure all security incidents get entered into the new Intelex safety management system.

1.3.1 Muni collisions/100,000 miles

- Consider reporting preventable collisions separately in addition to total collisions.

1.3.3 Muni falls on board/100,000 miles

- Rename this metric "Passenger falls on board Muni per 100,000 miles."

1.3.4 "Unsafe operation" Muni complaints to 311

- Normalize to mileage, boardings or service hours to control for changes in service delivery year over year.

1.3.5 Customer rating: Safety of transit riding experience

- Replace the quarterly panel survey with the annual rider survey.

2.1.1 Customer rating: Overall customer satisfaction with transit services

- Replace the quarterly panel survey with the annual rider survey.
- Utilize the forthcoming *MuniMobile* Rate My Ride survey feature to obtain timely customer feedback.

2.1.5 Customer rating: Communications to passengers

- Replace the quarterly panel survey with the annual rider survey.

2.1.7 Percentage of actionable 311 Muni-related complaints addressed within 28 days

- Expand and revise metric to track percent of all PSRs closed within a predetermined, relevant performance threshold.
- Develop additional metrics to track volume of customer complaints and response times.
- Normalize to service hours to control for changes in service delivery year over year.

2.1.8 Customer rating: Cleanliness of Muni vehicles, 2.1.9 Customer rating: Cleanliness of Muni facilities

- Replace the quarterly panel survey with the annual rider survey.

2.2.1 Percentage of transit trips with bunching and gaps on Rapid Network

- Enable reporting of headway-related metrics for each service category.

2.2.2 On-time performance for non-Rapid Network routes

- Expand reporting to show on-time performance by service category.

2.2.3 Percentage of scheduled service delivered (trips)

- Discontinue this metric in favor of 2.2.9 Percentage of scheduled service hours delivered.

2.2.4 Percentage on-time departure from terminals

- Expand reporting to show on-time departures from terminals by service category.

2.2.6 Percentage of on-time performance

- Rename the metric “Systemwide On-Time Performance.”

2.2.7 Percentage of trips over capacity during AM and PM peaks at max load points

- Expand reporting over-crowding by service category.

2.2.8 Mean distance between failure (MDBF)

- Use this metric for bus, light rail and historic streetcar only.
- Consider implementing a new metric “Preventative Maintenance: On-Time Performance.”

2.2.9 Percentage of scheduled service hours delivered

- Transition data collection to OrbStar CAD/AVL radio system when it’s available.

2.2.12 Percentage of days that elevators are in full operation;

2.2.13 Percentage of days that escalators are in full operation

- Rename metrics to “Operational Availability of Elevators/Escalators” or “Elevator/Escalator Time in Service” which is more user-friendly and used in the industry.

3.4.2 Average passengers per revenue hour (bus)

- This metric should be expanded to all modes.

3.4.3 Cost per unlinked trip

- Rename this metric “Cost per boarding.”

4.2.1 Employee satisfaction

- Improve response rates to the survey
- Change the annual survey frequency to biennial and hire a professional firm to conduct the survey.

4.3.3 Unscheduled absence rate by transit operators.

- Expand reporting to all SFMTA staff and track absence rates through the PeopleSoft payroll system.

Chapter 1 Historical Context

PROPOSITION E – THE MUNI REFORM INITIATIVE

The San Francisco Municipal Transportation Agency (SFMTA) was formed in 1999, when the transit operations of Muni and the street operations of the Department of Parking and Traffic merged into a single agency. The voters' intent was to institute structural, administrative, and financial reforms designed to provide Muni with the "resources, independence and focus necessary" to become one of the best urban transit systems in the world. Recognizing the City's dependence on public transit and its need for efficient and reliable transit service that can compete with the private automobile, the drafters of the initiative sought to restructure the City's provision and administration of transportation and parking services, and strengthen the City's Transit First Policy.

Now known as Article VIIIA of the San Francisco City Charter, the overall goals relating to transit service are (Section 8A.100):

1. Reliable, safe, timely, frequent, and convenient service to all neighborhoods;
2. A reduction in breakdowns, delays, over-crowding, preventable accidents;
3. Clean and comfortable vehicles and stations, operated by competent, courteous, and well-trained employees;
4. Support and accommodation of the special transportation needs of the elderly and the disabled;
5. Protection from crime and inappropriate passenger behavior on the Municipal Railway; and
6. Responsive, efficient, and accountable management.

To achieve these goals, Article VIIIA created the San Francisco Municipal Transportation Agency (SFMTA), combining the responsibility for street operations (Department of Parking and Traffic) with the dominant "user" of the streets, Muni.

The San Francisco City Charter explicitly delineates on-time performance and service delivery standards in Service Standards and Accountability Section 8A.103 (c). This includes minimum standards for on-time performance at 85%, defined as between one minute early and 4 minutes late. It also set service delivery standards, defined as scheduled service hours & scheduled pull-outs at 98.5%. Sec. 8A.103 (d) is more flexible. It states: The Board of Directors shall adopt Agency rules setting additional measurable standards for system reliability, system performance, staffing performance, and customer service, including:

1. Passenger, public, and employee safety and security;
2. Coverage of neighborhoods and equitable distribution of service;
3. Level of crowding;
4. Frequency and mitigation of accidents and breakdowns;
5. Improvements in travel time, taking into account adequate recovery and lay-over times for operators;
6. Vehicle cleanliness, including absence of graffiti;
7. Quality and responsiveness of customer service;
8. Employee satisfaction;
9. Effectiveness of the preventive maintenance program; and
10. Frequency and accuracy of communications to the public.
11. The Agency's duties related to parking and traffic functions and any other functions that may be added to the Agency's responsibilities.

FY 2013 – 2018 STRATEGIC PLAN

With the adoption of the FY 2013-2018 Strategic Plan, the SFMTA introduced a complete overhaul of the service standards reporting system.

The FY 2013 – 2018 Strategic Plan identifies four strategic goals. They are:

- Goal 1: Create a safer transportation experience for everyone
- Goal 2: Make transit, walking, bicycling, taxi, ridesharing & carsharing the preferred means of travel

- Goal 3: Improve the environment and quality of life in San Francisco
- Goal 4: Create a workplace that delivers outstanding service

Where the City Charter left the specifics of metrics and targets open for interpretation, the Strategic Plan aimed to explicitly state Key Performance Indicators, and a host of other performance metrics. At the close of FY 2016 there were over 70 Strategic Plan metrics addressing the SFMTA's infrastructure, operations, sustainability, and labor.

The SFMTA constantly looks to refine metrics as better data become available, or as systems or processes are upgraded. The SFMTA aims to make data more accessible to the public and ensure they are focusing efforts on measures that will help solve business problems and create a better user experience.

Chapter 2 Methodology

Article VIIIA of the San Francisco City Charter mandates an audit of data collection and reporting methods for transit-related service standards every two years. Defining performance metrics (also known as service standards) in the City Charter and Strategic Plan(s) ensures that SFMTA has the tools needed to create a world-class transit service. While the City Charter provides the basic framework for transit service standards, the FY 2013 – 2018 Strategic Plan fills in the gaps to help tell the story of how well SFMTA is meeting its goals and objectives.

When not specified by the San Francisco City Charter, the SFMTA Board adopts methods and definitions of measurement as well as specific goals and milestones for each of the performance metrics. The Muni Citizens' Advisory Council (CAC) and the SFMTA Board review the definitions and methods of measurement, and the goals for each of the performance metrics annually. Metrics reports are produced and distributed to the SFMTA Board and public on a monthly basis.

The Performance & Business Support Team, housed within the Performance section of the Finance and Information Technology Division, is responsible for reporting the service standards stated in the San Francisco City Charter as well as the performance metrics associated with the Strategic Plan. The Performance Team continuously evaluates whether additional metrics are warranted and makes annual recommendations for metric updates to the SFMTA board.

For this report, independent auditors reviewed the source data that goes into producing SFMTA's monthly Strategic Plan Metrics Reports. SFMTA staff were a key resource in explaining changes in data collection or methodology. Auditors spoke with relevant staff at meetings, by phone, and via email to review procedures and dig deeper into trends or anomalies in the actual reported data. Staff also provided auditors with relevant presentations or documentation to provide context.

REVIEW OF DATA COLLECTION METHODS

Reporting Methods

Transtat is the SFMTA's central performance business intelligence tool introduced in FY 2013 to help fulfill SFMTA leadership's commitment to timely and transparent performance reporting. Used to produce the monthly Strategic Plan Metrics Reports analyzed in this audit, it also functions as a crucial data analysis and visualization tool for Agency employees.

Transtat allows all divisions to regularly monitor performance data that is most relevant to them. SFMTA executive staff and the Performance team hold monthly "Transtat" meetings designed to review key metric trends and discuss possible actions aimed at improving performance. Examples of meeting topics include operations, maintenance, and security which rotate on a set schedule.

Monthly Strategic Plan Metrics Reports are published to track the progress of each metric. These reports include data for the 12 months prior to the month of publication, as well as average annual data as far back as FY 2012, where applicable. Currently, Strategic Plan Metrics Reports measure progress in two ways:

- For Key Performance Indicators (KPIs), specific targets were set forth in the FY 2013-2018 Strategic Plan.
- Monthly and (average) yearly performance is compared to the previous year.

Performance trends that look out of the ordinary show up quickly in Transtat, allowing Agency staff to analyze whether problems are related to actual performance, or whether there is a problem with data collection.

Technology Upgrades

Automatic Passenger Counters (APCs) are mounted on the doors of about 40% of buses in the system in order to track ridership. APC-equipped buses are deployed on routes all over the system, collecting average daily ridership by route over the course of each month. During this audit period, many buses with older-generation APCs were retired as new buses with newer-generation APCs began service. New APCs have incrementally gone live as the new OrbStar CAD/AVL radio system has been implemented, resulting in a temporary reduction in data collection among vehicles with older APC technology. In the meantime, manual estimations using available APC data have been used to report systemwide ridership. The OrbStar CAD/AVL radio system will integrate APC data with all other onboard systems to provide more reliable and fully integrated service data in the next audit cycle. Additional integration

between the existing legacy and newer-generation APC data collection systems is planned for FY 2018. The lack of broad APC data collection across all bus lines affects the following metrics:

- 2.2.7 Percentage of Trips Over Capacity During Peak at Max Load Points
- 2.2.11 Ridership (Bus and Metro Faregates, Average Weekday)

Upcoming Technology Changes

Technology and software upgrades provide the SFMTA the opportunity to improve the reliability and accuracy of data and reporting. They offer the SFMTA the ability to drill down to levels of granularity that were not previously possible. With a better understanding of data and trends, there is an opportunity to expand the focus of analysis. Auditors found that even with the risk of losing consistency during such transitions, data collection should remain reliable and transparent.

Major technology upgrades following this audit period relevant to data collection for this report include the deployment of:

- OrbStar CAD/AVL radio and Automatic Passenger Counters
- Intelex Safety Management System
- Odyssey Electric Validating Fareboxes
- Arrival prediction (NextBus) software
- Infor Enterprise Asset Management System (EAMS)

The **new OrbStar CAD/AVL radio system** will improve communications and therefore data reliability for metrics that rely on the radio system. It had not been fully deployed at the end of this audit cycle. **OCC logs** will still be used, but the incident management and reporting processes will be streamlined and standardized during the next audit period. Metrics that will benefit from the new OrbStar CAD/AVL radio system include:

- 2.2.1 Percentage of Transit Trips with Bunching and Gaps on Rapid Network
- 2.2.2 On-Time Performance for Non-Rapid Network Routes
- 2.2.3 Percentage of Scheduled Service Delivered (Trips)
- 2.2.4 Percentage of On-Time Departures from Terminals
- 2.2.6 Systemwide On-Time Performance
- 2.2.9 Percentage of Scheduled Service Hours Delivered
- 2.2.11 Ridership (Bus and Metro Faregates, Average Weekday)

Intelex will replace the data repository **TransitSafe** as the SFMTA's central safety management system. It is the system of record for security incidents and collisions. SFMTA staff confirmed that the new system should not impact historical trend reporting of safety incidents. Metrics that rely on accurate data entry in TransitSafe include:

- 1.2.2 Security Incidents Involving SFMTA Personnel (Muni)
- 1.3.1 Muni Collisions/100,000 Miles
- 1.3.3 Muni Falls on Board/100,000 Miles

Processes

The Performance Team is still working with the SFPD to establish process for collecting incident data that limits the risks of infrequently reported data. There were no major issues with data collection during this audit period, but after the SFPD staff person responsible for compiling Muni-related incident data retired, it brought to light risks of consistent and frequent data reporting and prompted SFMTA and SFPD staff to determine how to best continue collecting information. This impacts one metric:

- 1.1.1 SFPD-reported Muni-related crimes per 100,000 miles

The **Passenger Service Reports** (**PSR)** process was updated in FY 2016 from a manual tabulation to an automated tabulation that reads Trapeze customer service system records directly. There were no challenges or concerns with metrics related to PSRs, but new metrics are being considered that may better meet the objectives of the SFMTA, including those that encompass a broader range of operations and measure the Agency's responsiveness to customer feedback. This is due in part from results of a PSR audit that was finalized in FY 2017. Metrics impacted by changes to definitions that would impact the ability to look at trends, or change the data collection efforts include:

- 1.1.4 Security Complaints to 311
- 1.3.4 "Unsafe Operation" Muni Complaints to 311
- 2.1.7 Percent of Actionable 311 Muni-related Complaints Addressed within 28 days
- 4.3.5 Employee Commendations to 311

The **Quarterly Customer Satisfaction Survey,** started in FY 2014, has been an improvement from previous survey efforts by providing SFMTA staff with frequent pulses of customer sentiment. To increase representativeness of the survey, responses are weighted by zip code.

The main limitation of the quarterly survey has been survey fatigue from people continuously being asked to take the survey. The SFMTA is still searching for the right balance for data collection—one that offers a feedback loop on a meaningful timeline and is representative of riders. Furthermore, the methodology of this new survey differed enough from previous survey efforts that results could not compared to analyze historic trends. Metrics impacted include:

- 1.1.2 Customer Rating: Security of Transit Riding Experience while on a Muni Vehicle; While Waiting at a Muni Stop or Station
- 1.3.5 Customer Rating: Safety of Transit Riding Experience
- 2.1.1 Customer Rating: Overall Customer Satisfaction with Transit Services
- 2.1.5 Customer Rating: Communications to Passengers
- 2.1.8 Customer Rating: Cleanliness of Muni Vehicles
- 2.1.9 Customer Rating: Cleanliness of Muni Facilities

The process for measuring and tracking **2.2.8 Mean Distance Between Failures** (MDBF) has evolved over the years. The data collection efforts are different between rail, bus, and cable car. For buses, the process entails the reconciliation between actual maintenance road calls and reported incidents within the SHOPS maintenance database. For rail, all delay incident data from the OCC are downloaded and staff manually searched and matched to work orders in the SHOPS database, and ultimately summarized in spreadsheets.

Cable car maintenance staff assert that vehicle breakdowns are not ideal for performance reporting, as mechanical service disruptions typically have to do with cable health, and not individual cars. For this reason, Cable Car staff discontinued reporting MDBF after March 2016 and are currently assessing options for a more suitable alternative maintenance performance metric.

MDBF can also be measured inconsistently due to variations in standard operating procedures among modes or maintenance divisions. For example, a five-minute line delay threshold is used to qualify a vehicle breakdown as a mechanical failure for rail but not for other modes. That threshold was used as a way to whittle down results from all vehicle delays during the manual searching through OCC logs. The National Transit Database (NTD) considers a failure something that prevents the vehicle from completing its current trip or starting the next trip. This is a challenge for reporting.

Transit performance staff are currently reviewing all MDBF data collection processes to improve standardization and accuracy of reporting.

Chapter 3
Analysis of SFMTA Transit Performance Metrics

Article VIIIA of the San Francisco City Charter specified measures and targets for on-time performance, and service delivery, and directed the Agency to set additional measurable standards for system reliability, system performance, staffing performance, and customer service. Additional metrics were created through the FY 2013 – 2018 Strategic Plan, which addressed four overarching goals tied to key performance metrics. This chapter discusses in detail the Strategic Plan metrics related to Muni transit performance.

The metrics are grouped by the four goals listed in the FY 2013 – 2018 Strategic Plan. In this chapter, the following elements are provided, as applicable:

Purpose: to explain why the metric is being reported.

Description: to provide the meaning of the metric.

Method: to explain how data are collected, reported, and analyzed to produce the metric.

City Charter Target or **Strategic Plan Target:** Latest annual target for the metric, if the metric serves as a Key Performance Indicator.

FY 15-16 Performance: Whether or not the SFMTA achieved the metric target during the audit period.

Trend: Assessment of the audit period performance, determined to be positive, negative, or neutral in relation to attainment of targets or, in the absence of a target, as pertains to improvement of performance.

Audit Period Performance: Graphical or tabular representation of FY 2015-2016 data.

Historic Performance: Graphical or tabular representation of historical data, where such data are available.

Discussion: Describes observed trends and/or the results of interviews with applicable SFMTA staff.

Recommendations: Identifies where problems or inefficiencies in data collection, reporting, or analysis may be occurring and recommends 1) clear solutions to these problems; or 2) approaches the SFMTA may take in addressing the issues.

As a reminder, the analysis contained in this chapter focuses on Muni performance for each of the metrics that were in effect during the period covered by this review (FY 2015 and 2016). Up-to-date monthly performance reports can be viewed on the SFMTA website.

Goal 1: Create a safer transportation experience for everyone

1.1.1 SFPD-Reported Muni-Related Crimes/100,000 Miles

FY 15-16 Performance	Trend
X Goal Not Achieved	✓ Positive

Purpose

To measure passenger and public safety on Muni.

Description: This metric tracks security incidents on Muni vehicles and at stops and stations that result in an SFPD police report.

Method: Data from the SFPD Crime Data Warehouse are exported and emailed monthly to the SFMTA Security, Investigations & Enforcement (SIE) staff and uploaded into an SFMTA database. Incidents are reported directly from the database and normalized to mileage counts from the SHOPS asset management data system.

Strategic Plan FY 2016 Target: 3.1. General: 10% reduction in incidents each budget cycle.

Discussion

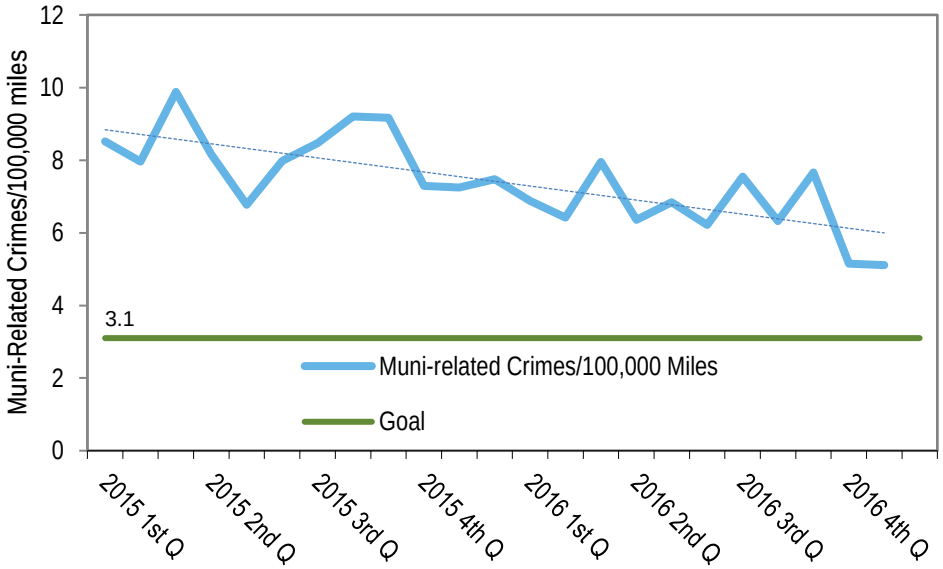
A significant methodological change occurred in January 2013 (Q3 of FY 2013), when the Muni-related crimes definition was expanded to include incidents at Muni stops and stations; creating the appearance that the number of incidents had risen significantly. However, reported Muni-related crimes per 100,000 miles have been decreasing over the last two fiscal years using the expanded definition. Beginning in FY 2017 the new target aims to achieve a 10% reduction in incidents over the baseline.

The timing of data transmissions from SFPD to the SFMTA has become somewhat inconsistent, occasionally resulting in several months elapsing before new data are reported.

Recommendations

Establish a protocol for receiving crime data from SFPD on a regular basis. Muni staff should work with the SFPD to develop procedures to access the relevant crime data regularly, either by creating a data warehouse from which Muni staff can export a designated query, or by designating SFPD personnel to send specific data directly to the Muni staff on a timely and consistent basis.

Audit Period Performance



Historic Performance

FY13 Avg	FY14 Avg	FY15 Avg	FY16 Avg
7.6	9.5	8.2	6.4

1.1.2 Customer Rating: Security of Transit Riding Experience While on a Muni Vehicle; While Waiting at a Muni Stop or Station

FY 15-16 Performance	Trend
No Goal Established	○ Neutral

Purpose

To measure the perception of passenger security.

Description: This metric measures riders' perception of safety while riding Muni or waiting at a stop or station, based on results from the Quarterly Customer Satisfaction Survey.

Method: Results are the average rating from responses of the Quarterly Customer Satisfaction Survey submitted by an opt-in panel of riders, where 1 = very dissatisfied and 5 is very satisfied. Results are weighted by ZIP code; Only SF residents' answers are included.

Discussion

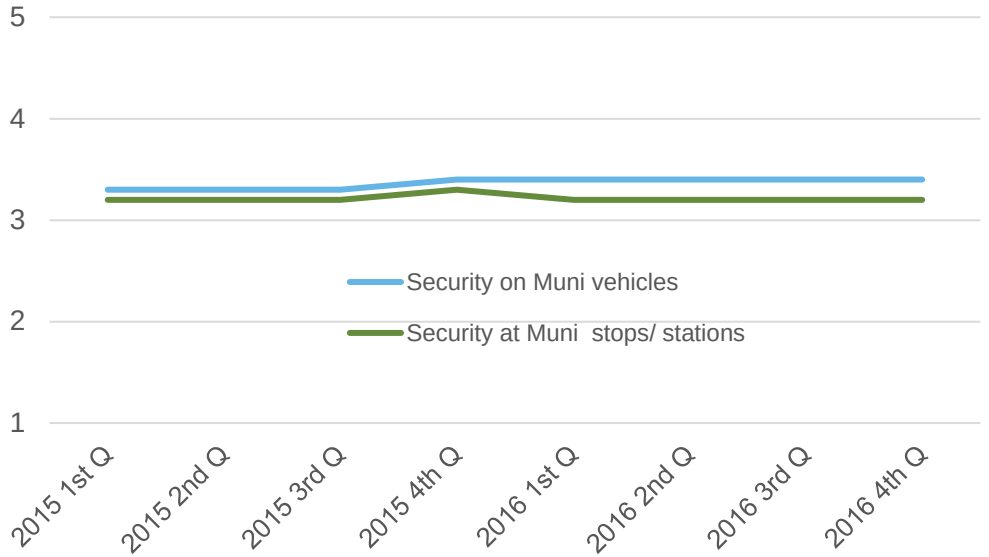
Since Q4 of FY 2014, the quarterly survey has been conducted online by an opt-in panel, which originally consisted of approximately 6,000 members. Now there are just under 4,000 members. During the audit period, between 1,300 and 2,700 members took the survey each quarter.

Muni customers' opinions of transit security on vehicles, and at stops and stations remained consistent over the course of the audit period, with customers answering that they were slightly satisfied, on average.

Recommendations

Replace the quarterly panel survey with the annual rider survey. While the SFMTA staff-administered survey panel provides an opportunity to collect frequent, low-cost quarterly feedback, respondents do not comprise a probability sample that is truly representative of the San Francisco population. Therefore, no statistical testing for significance can be performed with the results to determine key relationships between survey variables. Although a quarterly feedback loop seems preferable to once a year, the annual rider survey is a statistically significant representation of the City's Muni-riding population. The past two years have demonstrated that there aren't major swings in customer satisfaction throughout the year that would require the SFMTA to act immediately. Therefore, the more common industry practice of an annual survey schedule is sufficient and the quarterly surveys should be retired.

Audit Period Performance



Historic Performance

Metric	FY15 Avg	FY16 Avg
Security on Muni vehicles	3.3	3.4
Security at Muni stops/ stations	3.2	3.2

1.1.4 Security Complaints to 311 (Muni)

Purpose

To measure passenger security.

Description: This metric tracks incidents in the "Criminal Activity" category of 311 data, including incidents such as miscellaneous altercations, larceny/theft, fare evasion/transfer abuse, and disorderly conduct/disturbances.

Method: The SFMTA's Muni Customer Service unit converts passenger complaints, comments, questions, and compliments into Passenger Service Reports (PSRs). These PSRs are stored and reported from the Trapeze transit scheduling system.

Discussion

This metric is based on the number of security incidents reported via 311; the actual number of incidents may be under-reported.

The number of 311 security complaints fell over the audit period from an annual average of 37.2 in FY 2015 to 28.8 in FY 2016, a drop of 22.5%. With the exception of FY 2015, the trend has been positive since FY 2012.

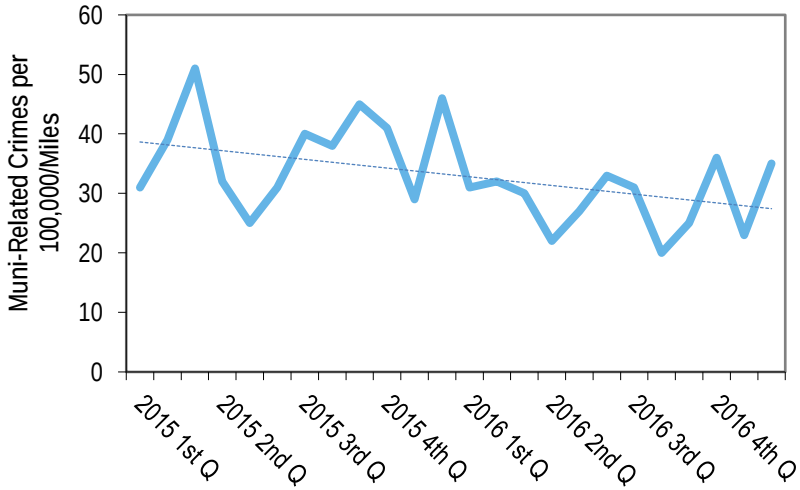
The audit period high of 51 in Q1 of FY 2015 was followed by 25 reported incidents in Q2. The audit period low of 23 occurred in Q4 of 2016.

Recommendations

Normalize complaints to mileage, boardings, or service hours. This would control for the changes in service delivery year over year.

FY 15-16 Performance	Trend
No Goal Established	✓ Positive

Audit Period Performance



Historic Performance

FY12 Avg	FY13 Avg	FY14 Avg	FY15 Avg	FY16 Avg
42.0	36.4	28.6	37.2	28.8

1.2.1 Workplace Injuries/200,000 Hours

FY 15-16 Performance	Trend
X Goal Not Achieved	X Negative

Purpose

To measure employee safety at work.

Description: This metric tracks the number of workplace injuries per 200,000 hours, which is based on a 40-hour workweek for 100 full-time employees.

Method: Tracks monthly Worker's Compensation (WC) claims opened as reported in the monthly Worker's Claim Status Report, in relation to monthly employee pay hours. In the context of these WC claims, an "injury" is an event that occurs to any SFMTA employee that results in any form of medical treatment or lost time from work. This includes any incident such as a cut, fracture, sprain, amputation, etc. which results from a work accident.

Strategic Plan FY 2016 Target: 11.3 per 200,000 hours, and a 10% reduction in incidents each budget cycle.

Discussion

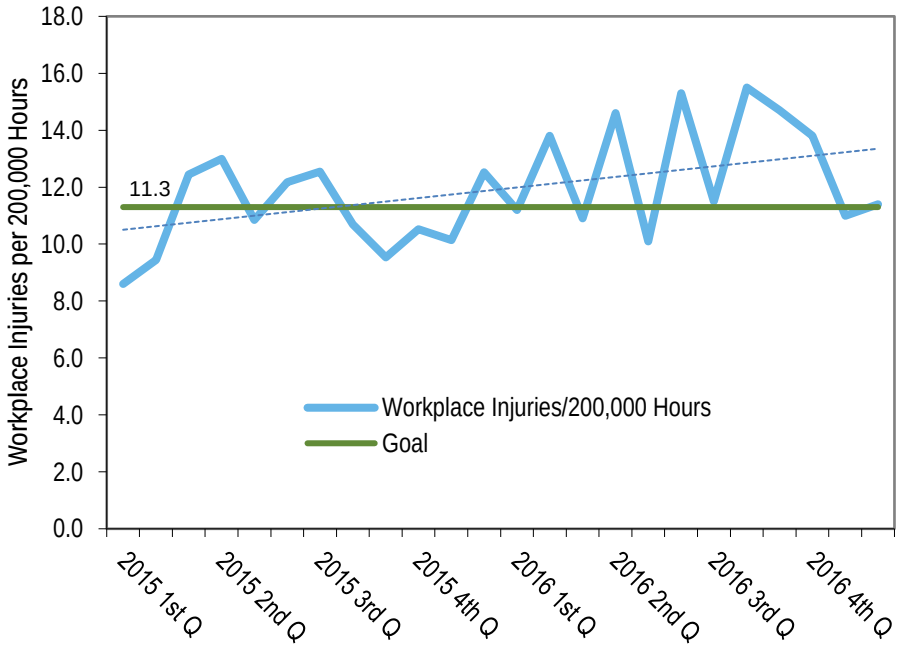
This metric is based on the U.S. Department of Labor's definition of the injury incidence rate. The rate at the SFMTA declined between FY 2012 and FY 2015, but the increase in FY 2016 was enough to result in the audit period trending negatively upward. The SFMTA met the goal of 11.3 workplace injuries/200,000 hours in FY 2015, but not in FY 2016.

Since this metric reflects injury data for the months that WC claims are received rather than the actual month of injury occurrence, there may be a lag between actual and reported incidents.

Recommendations

None.

Audit Period Performance



Historic Performance

FY12 Avg	FY13 Avg	FY14 Avg	FY15 Avg	FY16 Avg
16.2	13.8	12.1	11.0	12.8

1.2.2 Security Incidents Involving SFMTA Personnel (Muni Only)

Purpose

To measure employee security.

Description: This metric tracks the number of security incidents reported by Muni personnel. Incidents are defined as assaults and threats.

Method: Incidents are recorded in the SFMTA's internal TransitSafe software system, and reported directly from the system's database.

Discussion

After declining for three fiscal years, there was a major increase in security incidents involving the SFMTA personnel between FY 2015 and FY 2016 from 8.3 to 12.8.

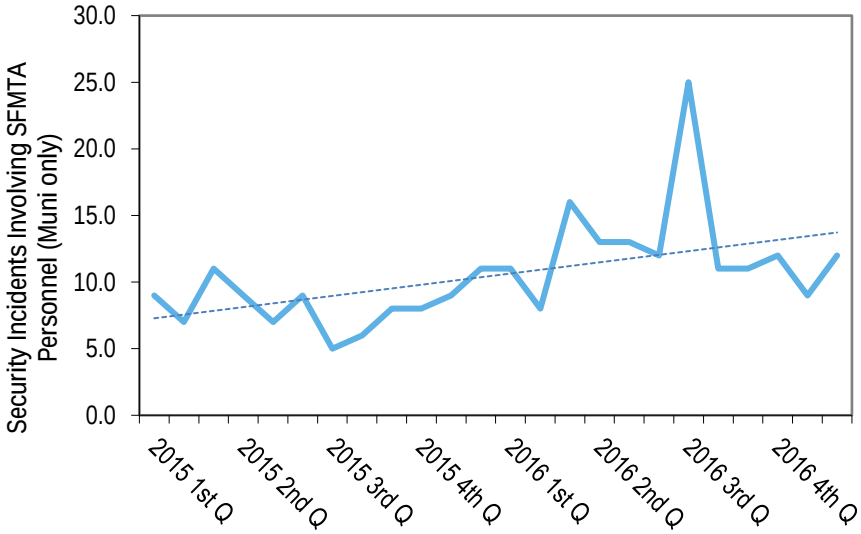
During the next audit cycle, Intelex will replace TransitSafe as the method for logging security incidents. Incident reporting should be consistent so that historical comparisons will still be possible. The new OrbStar CAD/AVL radio system may impact how calls get logged initially, and getting the workflow stabilized will involve a learning curve for the SFMTA staff.

Recommendations

Develop a standard operating procedure to ensure all security incidents are entered into Intelex. As incident reporting is expanded to all staff, not just operator incidents, a standardized procedure should help new users understand how the program works and encourage them to use it.

FY 15-16 Performance	Trend
No Goal Established	X Negative

Audit Period Performance



Historic Performance

FY12 Avg	FY13 Avg	FY14 Avg	FY15 Avg	FY16 Avg
11.3	12.1	9.9	8.3	12.8

1.3.1 Muni Collisions/100,000 Miles

FY 15-16 Performance	Trend
X Goal Not Achieved	X Negative

Purpose

To measure the frequency of collisions.

Description: This metric tracks collisions involving a Muni vehicle. A "collision" is defined as contact between one of Muni's vehicles and another vehicle, person, or object.

Method: SFMTA staff manually enter individual hand-written incident reports into the TransitSafe system. Incidents are reported directly from the system's database and normalized to mileage from the SHOPS asset management data system.

Strategic Plan FY 2016 Target: 3.5 per 100,000 miles and reduce the collision rate by 10% every two years.

Discussion

The City Charter calls for a measurable standard for the frequency and mitigation of accidents and breakdowns. Muni collisions per 100,000 miles is an industry standard for tracking collision frequency.

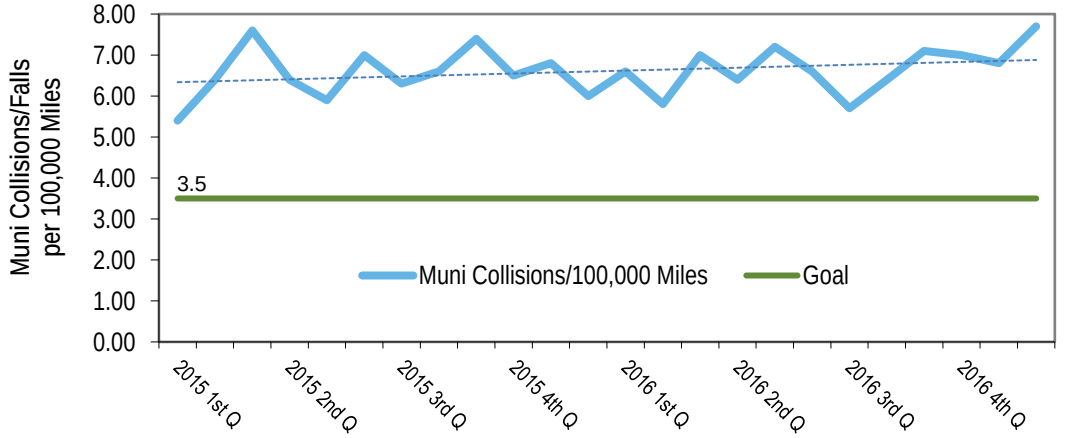
The number of Muni collisions continues to rise, hitting a ten-year high of 6.6 collisions per 100,000 miles in FY 2016.

The TransitSafe data system is being replaced by Intelex in FY 2017. The new system should reduce the amount of manual data entry, with further efficiencies likely to take place in the coming years as the workflow develops.

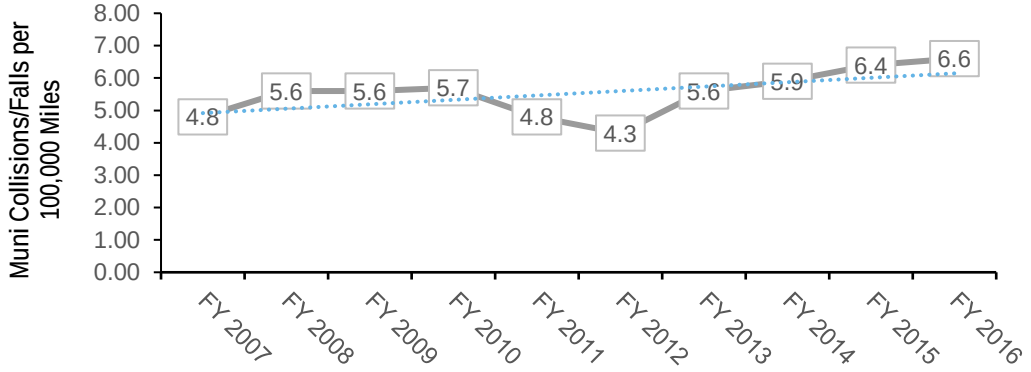
Recommendations

Consider reporting preventable collisions in addition to total collisions. Separating preventative collisions helps the SFMTA determine whether to focus on re-training vs. opportunities for possible changes to street design. This distinction should be shared with the public for increased transparency.

Audit Period Performance



Historic Performance



1.3.3 Muni Falls on Board/100,000 Miles

Purpose

To measure passenger safety.

Description: A fall on board is defined as when a rider falls while on board a Muni vehicle.

Method: The SFMTA staff manually enter individual hand-written incident reports into the TransitSafe system. Incidents are reported directly from the system's database and normalized to mileage from the SHOPS asset management data system.

Discussion

TransitSafe is being replaced with Intelex, which is scheduled to start in FY 2017. This will reduce the amount of manual data entry required to track passenger falls on Muni.

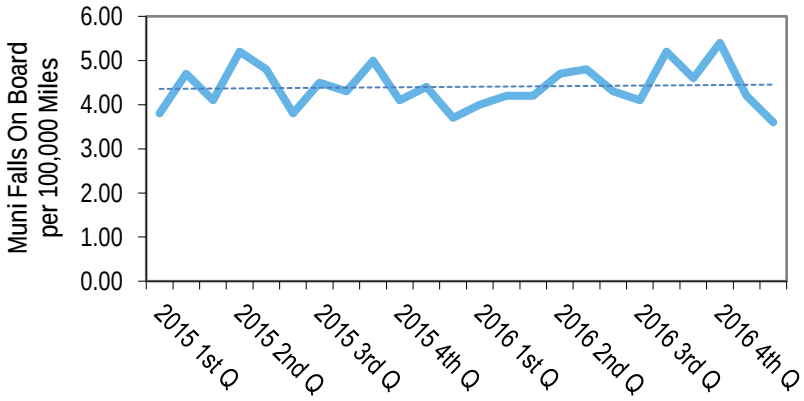
Rates of falls on board were stable during this audit period, with a low of 3.9 falls on board per 100,000 miles in Q4 in FY 2015, and a high of 4.6 in Q3 of FY 2016. The number of falls per 100,000 miles has been trending positively since the high of 4.8 falls in FY 2010, but is still higher than the number of falls per 100,000 miles in FY 2007 and 2008.

Recommendations

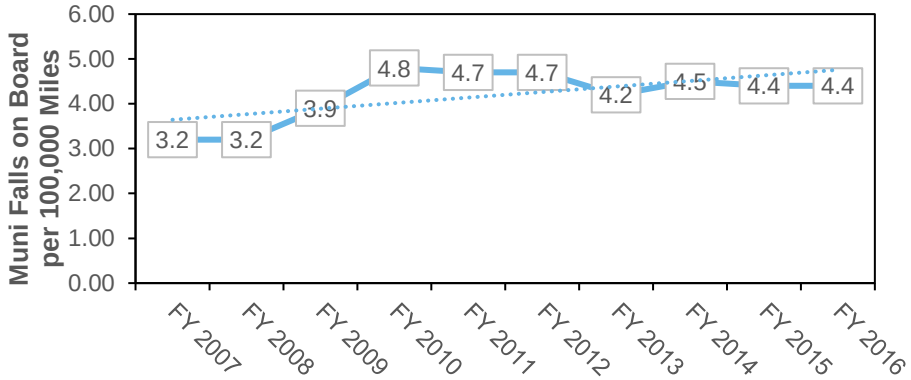
Rename this metric "Passenger Falls on Board Muni per 100,000 Miles" in the next Strategic Plan. This title change will make the metric's performance standard more self-evident.

FY 15-16 Performance	Trend
No Goal Established	○ Neutral

Audit Period Performance



Historic Performance



1.3.4 "Unsafe Operation" Muni Complaints to 311

Purpose

To measure the perception of passenger safety.

Description: This metric tracks the perception of passenger safety based on the number of Muni complaints via 311 that are categorized as an unsafe operation.

Types of activities deemed to be "Unsafe Operations" include running a red light or stop sign, speeding, being allegedly under the influence of drugs or alcohol, using a mobile phone or radio, eating, drinking or smoking, and general careless operation. It also includes other incidents captured in other tracked metrics, such as a collision, a fall boarding/on board/alighting that causes an injury.

Method: The SFMTA's Muni Customer Service unit converts passenger complaints, comments, questions, and compliments into Passenger Service Reports (PSRs). These PSRs are stored and reported from the Trapeze transit scheduling system.

Discussion

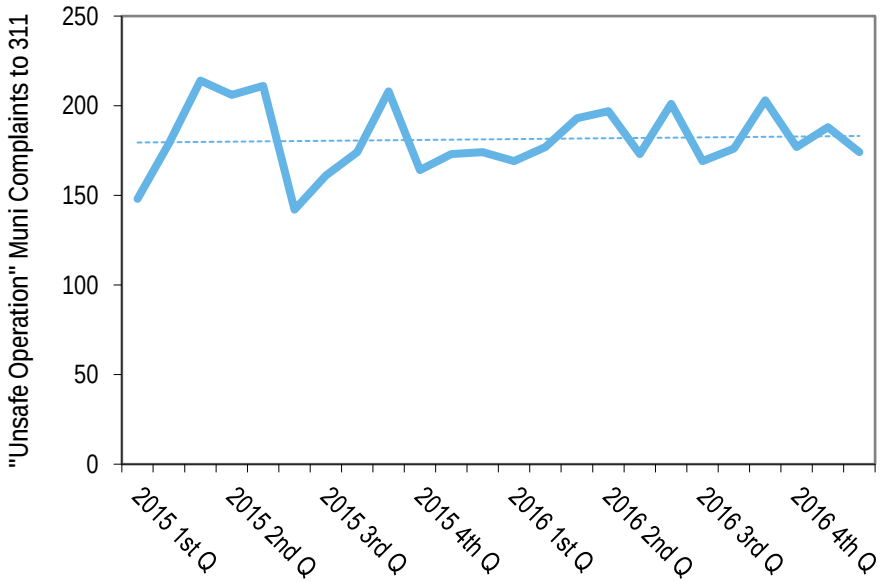
Despite a dip in the average number of reported "unsafe operation" complaints in FY 2013, the five-year trend has been trending negatively. There were greater fluctuations in FY 2015 than in FY 2016, although the average number of unsafe operation complaints to 311 was slightly higher in FY 2016, with an average of three more monthly complaints in FY 2016 than FY 2015.

Recommendations

Normalize complaint metrics to mileage, boardings, or service hours. This would control for the changes in service delivery year over year.

FY 15-16 Performance	Trend
No Goal Established	X Negative

Audit Period Performance



Historic Performance

FY12 Avg	FY13 Avg	FY14 Avg	FY15 Avg	FY16 Avg
179.0	157.3	174.3	179.6	183.5

1.3.5 Customer Rating: Safety of Transit Riding Experience

FY 15-16 Performance	Trend
No Goal Established	✓ Positive

Purpose

To measure the perception of passenger safety.

Description: Measures riders' perception of safety of the transit riding experience based on the average rating from the Quarterly Customer Satisfaction Survey.

Method: Results are the average rating from responses of the Quarterly Customer Satisfaction Survey submitted by an opt-in panel of the SFMTA customers, where 1 = very dissatisfied and 5 is very satisfied. Results are weighted by ZIP code; Only SF residents' answers are included.

Audit Period Performance

FY 2015				FY 2016			
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
3.8	3.7	3.8	3.7	3.8	3.9	3.8	3.8

Historic Performance

FY15 Avg	FY16 Avg
3.7	3.8

Discussion

Since Q4 of FY 2014, the quarterly survey has been conducted online by an opt-in panel, which originally consisted of approximately 6,000 members. Now there are just under 4,000 members. During the audit period, between 1,300 and 2,700 members took the survey each quarter.

Surveyed Muni customers were satisfied with the perception of safety for the overall transit riding experience. Respondents were slightly more satisfied in FY 2016 than FY 2015.

Recommendations

Replace the quarterly panel survey with the annual rider survey. While the SFMTA staff-administered survey panel provides an opportunity to collect frequent, low-cost quarterly feedback, respondents do not comprise a probability sample that is truly representative of the San Francisco population. Therefore, no statistical testing for significance can be performed with the results to determine key relationships between survey variables. Although a quarterly feedback loop seems preferable to once a year, the annual rider survey is a statistically significant representation of the City's Muni-riding population. The past two years have demonstrated that there aren't major swings in customer satisfaction throughout the year that would require the SFMTA to act immediately. Therefore, the more common industry practice of an annual survey schedule is sufficient and the quarterly surveys should be retired.

Goal 2: Make transit, walking, bicycling, taxi, ridesharing & carsharing the preferred means of travel

2.1.1 Customer Rating: Overall Customer Satisfaction with Transit Services

Purpose

To measure the customer satisfaction of transit services.

Description: Measures the customer satisfaction of transit services based on the Agency's Quarterly Customer Satisfaction Survey.

Method: Results are the average rating from responses of the Quarterly Customer Satisfaction Survey submitted by an opt-in panel of the SFMTA customers, where 1 = very dissatisfied and 5 is very satisfied. Results are weighted by ZIP code; Only SF residents' answers are included.

Strategic Plan FY 2016 Target: 3.5. General: Improve satisfaction rating by 0.5 points each budget cycle.

FY 15-16 Performance	Trend
X Goal Not Achieved	✓ Positive

Audit Period Performance

FY 2015				FY 2016			
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
3.1	3.0	3.0	3.1	3.2	3.2	3.2	3.2

Historic Performance

FY15 Avg	FY16 Avg
3.1	3.2

Discussion

Since Q4 of FY 2014, the quarterly survey has been conducted online by an opt-in panel, which originally consisted of approximately 6,000 members. Now there are just under 4,000 members. During the audit period, between 1,300 and 2,700 members took the survey each quarter.

The average rating for overall customer satisfaction with transit services improved during the audit period, but still missed the Strategic Plan Target of 3.5 for this budget cycle. Starting in FY 2017, the target will be modified to improve satisfaction by 0.2 points over the baseline by the end of the budget cycle. This is a more realistic goal.

Recommendations

Replace the quarterly panel survey with the annual rider survey. While the SFMTA staff-administered survey panel provides an opportunity to collect frequent, low-cost quarterly feedback, respondents do not comprise a probability sample that is truly representative of the San Francisco population. Therefore, no statistical testing for significance can be performed with the results to determine key relationships between survey variables. Although a quarterly feedback loop seems preferable to once a year, the annual rider survey is a statistically significant representation of the City's Muni-riding population. The past two years have demonstrated that there aren't major swings in customer satisfaction throughout the year that would require the SFMTA to act immediately. Therefore, the more common industry practice of an annual survey schedule is sufficient and the quarterly surveys should be retired.

Utilize the forthcoming MuniMobile *Rate My Ride* survey feature to obtain timely customer feedback. MuniMobile, the SFMTA's mobile fare payment app, will soon offer a *Rate My Ride* survey feature that will enable customers to provide instant feedback across a variety of Muni service attributes. Though the results will not be statistically significant or intended for public performance reporting, *Rate My Ride* will provide targeted and quick feedback loops for internal use and serve as an ideal replacement for quarterly panel surveys as the SFMTA transitions to the annual rider survey for public performance metric reporting.

2.1.5 Customer Rating: Communications to Passengers

Purpose

To measure the quality and responsiveness of customer service.

Description: Measures the effectiveness of Muni communications to passengers based on the Quarterly Customer Satisfaction Survey.

Method: Results are the average rating from responses of the Quarterly Customer Satisfaction Survey submitted by an opt-in panel of the SFMTA customers, where 1 = very dissatisfied and 5 is very satisfied. Results are weighted by ZIP code; Only SF residents' answers are included.

Discussion

Since Q4 of FY 2014, the quarterly survey has been conducted online by an opt-in panel, which originally consisted of approximately 6,000 members. Now there are just under 4,000 members. During the audit period, between 1,300 and 2,700 members took the survey each quarter.

Overall, satisfaction with communication to passengers improved to slightly more satisfied during the audit period, ending at 2.9, which was up from 2.8 in FY 2015.

Recommendations

Replace the quarterly panel survey with the annual rider survey. While the SFMTA staff-administered survey panel provides an opportunity to collect frequent, low-cost quarterly feedback, respondents do not comprise a probability sample that is truly representative of the San Francisco population. Therefore, no statistical testing for significance can be performed with the results to determine key relationships between survey variables. Although a quarterly feedback loop seems preferable to once a year, the annual rider survey is a statistically significant representation of the City's Muni-riding population. The past two years have demonstrated that there aren't major swings in customer satisfaction throughout the year that would require the SFMTA to act immediately. Therefore, the more common industry practice of an annual survey schedule is sufficient and the quarterly surveys should be retired.

FY 15-16 Performance	Trend
No Goal Established	✓ Positive

Audit Period Performance

FY 2015				FY 2016			
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
2.8	2.8	2.8	2.8	2.9	2.9	2.9	2.9

Historic Performance

FY15 Avg	FY16 Avg
2.8	2.9

2.1.7 Percentage of actionable 311 Muni operator conduct complaints addressed within 28 business days

FY 15-16 Performance	Trend
No Goal Established	X Negative

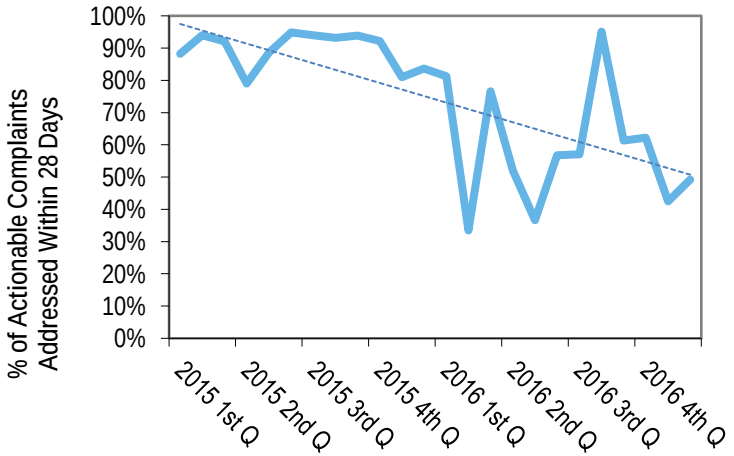
Purpose

To measure the quality and responsiveness of customer service.

Description: The SFMTA's Muni Customer Service unit converts passengers' complaints, comments, questions, and compliments into Passenger Service Reports (PSRs). "Actionable" PSRs are those that are determined to warrant a follow up action with a transit operator. This metric only includes operator conduct complaints within a Muni operations division. "Addressed" signifies that an event that has been closed in the system within 28 business days, the window in which discipline may be brought to a transit operator following a conduct complaint according to the Agency's MOU with the Operator's union.

Method: Prior to FY 2016, the SFMTA customer service staff compiled a list exported from Trapeze of actionable PSRs closed within 28-days. Beginning in FY 2016, the methodology for was automated to read and report directly from the Trapeze data system.

Audit Period Performance



Discussion

Beginning in FY 2016, a major staffing change in the Muni Customer Service unit resulted in a new methodology for computing and reporting this metric. Before, a more subjective approach to determine whether a PSR had been addressed. After automation, it was discovered that many resolved PSRs were simply not closed in the system, negatively skewing the reported results. The data entry for this metric should be more consistent in the future.

The percentage of actionable 311 Muni-related complaints addressed within 28 business days hit an average quarterly low of 33% in Q1 of FY 2016, falling from a high of 95% in Q2 of FY 2015. Although the drop may be partially due to the reporting methodology change mentioned above, there have also been several management staffing changes at the divisions, and some new supervisors who were new to the PSR process and Trapeze software.

Following an audit on the PSR process performed by the City Controller's Office, recommendations were made to improve the response process, as well as expand performance metrics to focus on customer satisfaction and response times.

Historic Performance

FY12 Avg	FY13 Avg	FY14 Avg	FY15 Avg	FY16 Avg
87%	90%	79%	90%	58%

Recommendations

Expand and revise metric to track percent of all PSRs closed within a predetermined, relevant performance threshold. The Performance Team should work with Muni Customer Service to determine appropriate performance thresholds for all Muni-related PSRs. Only operator conduct PSRs are required to be closed in 28 business days, which will not change, but standards should be adopted to enable Muni to be more responsive to customers for other types of complaints.

Develop additional metrics to track volume of customer complaints and response times. While the metric above track's timeliness with which the SFMTA staff take accountability actions for employee conduct issues, it does not capture the volume of complaints or promptness of follow-up with customers. Separate metrics should be developed to capture complaints per boardings or service hours and percentage of complaints responded to within timeliness standards. This is a recommendation from the PSR audit conducted by the City Controller's Office..

Normalize complaints to service hours. This would control for the changes in service delivery year over year.

2.1.8 Customer Rating: Cleanliness of Muni Vehicles

2.1.9 Customer Rating: Cleanliness of Muni Facilities (Stations, Elevators, Escalators)

Purpose

To measure the cleanliness of Muni vehicles, stations, elevators, and escalators.

Description: This metric tracks customer perception of cleanliness of Muni vehicles and facilities based on the Quarterly Customer Satisfaction Survey.

Method: Results are the average rating from responses of the Quarterly Customer Satisfaction Survey submitted by an opt-in panel of the SFMTA customers, where 1 = very dissatisfied and 5 is very satisfied. Results are weighted by ZIP code; Only SF residents' answers are included.

Discussion

The City Charter calls for a measure to track vehicle cleanliness, and the SFMTA has expanded the reporting to include the cleanliness of other facilities that are a part of the Muni experience for riders.

Since Q4 of FY 2014, the quarterly survey has been conducted online by an opt-in panel, which originally consisted of approximately 6,000 members. Now there are just under 4,000 members. During the audit period, between 1,300 and 2,700 members took the survey each quarter.

Overall, survey respondents were more satisfied with the cleanliness of Muni vehicles than Muni facilities. The customer rating for vehicle cleanliness on Muni vehicles trended upward during the current audit period, climbing to 2.9 in FY 2016 from 2.7 in FY 2015. The customer rating for facility cleanliness fell to 2.5 in FY 2016, down from 2.6 in the previous fiscal year, which is a neutral rating of neither satisfied or dissatisfied.

Recommendations

Replace the quarterly panel survey with the annual rider survey. While the SFMTA staff-administered survey panel provides an opportunity to collect frequent, low-cost quarterly feedback, respondents do not comprise a probability sample that is truly representative of the San Francisco population. Therefore, no statistical testing for significance can be performed with the results to determine key relationships between survey variables. Although a quarterly feedback loop seems preferable to once a year, the annual rider survey is a statistically significant representation of the City's Muni-riding population. The past two years have demonstrated that there aren't major swings in customer satisfaction throughout the year that would require the SFMTA to act immediately. Therefore, the more common industry practice of an annual survey schedule is sufficient and the quarterly surveys should be retired.

	FY 15-16 Performance	Trend
Vehicles	No Goal Established	✓ Positive
Facilities	No Goal Established	X Negative

Audit Period Performance

	FY 2015				FY 2016			
Metric	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Cleanliness of Muni vehicles	2.7	2.7	2.7	2.8	2.8	2.9	2.9	2.9
Cleanliness of Muni facilities	2.6	2.6	2.5	2.5	2.5	2.6	2.5	2.5

Historic Performance

	FY15 Avg	FY16 Avg
Cleanliness of Muni vehicles	2.7	2.9
Cleanliness of Muni facilities	2.6	2.5

2.2.1 Percentage of Transit Trips with Bunching and Gaps on Rapid Network

Purpose

To measure system reliability.

Description: This metric tracks the reliability of schedule adherence through bus bunching and gaps. Bunching is defined as transit trips that have less than a 2-minute spacing between vehicles by route. Gaps are defined as transit trips where gaps in service exceed scheduled headway by more than five minutes by line and route.

During Q4 of FY 2015 the term "Rapid" (R) replaced "Limited" (L) for Muni's limited-stop routes. The Rapid Network includes bus routes 5R, 7R, 9R, 14R, 28R, 38R, and Muni Metro Lines J, L, M, N, and KT.

Method: Scheduled headways in Trapeze are compared with the actual headways according to NextBus arrival times at timepoints along each route.

Strategic Plan FY 2016 Target: No more than 2.1% of trips bunches, or 10.7% trips with gaps. General: Eliminate bunches and gaps by 45% by FY 2016 over the FY 2012 baseline.

Discussion

The City Charter calls for a measurable standard with which to track the level of crowding. Crowding is most likely to occur when high-frequency bus routes run off schedule. Eliminating the resulting gaps and bunching from can help reduce crowding.

Through the ongoing Muni Forward Program, tools such as transit priority lanes, efficient stop spacing, improved boarding zones, and better signage are being deployed in an effort to reduce gaps and bunching.

Neither Strategic Plan Target was met during the audit period. The percentage of trips with gaps fell during the audit period, peaking in Q2 of FY 2016 with an average of 19.5%, and hitting a low of 14.9% in Q1 of FY 2016. The prevalence of gaps has improved between FY 2012 and FY 2016. Bunching increased slightly during the audit cycle, with the low of 4.1% of trips bunching in Q3 of FY 2015, and a high of Q1 of FY 2016.

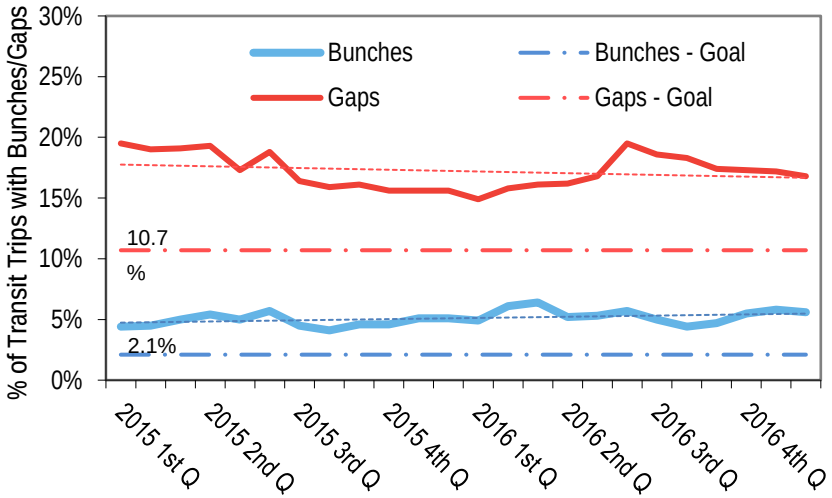
The quality of headway data is expected to be more reliable with the new OrbStar CAD/AVL radio system, which will produce its own reporting separate from NextBus.

Recommendations

Enable reporting of headway-related metrics for each service category. This will allow the public to see the differences between bus and Metro.

	FY 15-16 Performance	Trend
Bunches	X Goal Not Achieved	X Negative
Gaps	X Goal Not Achieved	✓ Positive

Audit Period Performance



Historic Performance

Metric	FY 2012	FY 2013	FY2014	FY 2015	FY 2016
Bunches	3.9%	4.0%	4.0%	4.8%	5.4%
Gaps	19.5%	17.8%	18.6%	17.2%	16.9%

2.2.2 On-Time Performance for Non-Rapid Network Routes

Purpose

To measure on-time performance (OTP).

Description: This metric tracks the on-time performance of routes not considered a part of the Rapid Network service category. Non-rapid routes include routes in the following service categories: Frequent Local, Grid, Circulator, Specialized, and Historic.

Method: The SFMTA compares Trapeze scheduled arrival times of non-Rapid routes with actual NextBus arrival times at timepoints along each route. A vehicle is considered "on time" if it is between one minute early and four minutes late (-1 to 4 minutes) from the published schedules.

City Charter Target: 85%

Discussion

On-time performance on non-Rapid routes has never met the Charter-specified goal of 85% for systemwide OTP, but did improve 3% during the audit period. OTP for non-Rapid routes hit a high of 63.3% in Q2 of FY 2016. Despite the recovery that began in Q3 of FY 2015, the average annual OTP in FY 2015 was lower than previous years. Historically, performance has remained relatively neutral, fluctuating between an average of 57.3% in FY 2015 and 61.0% in FY 2012.

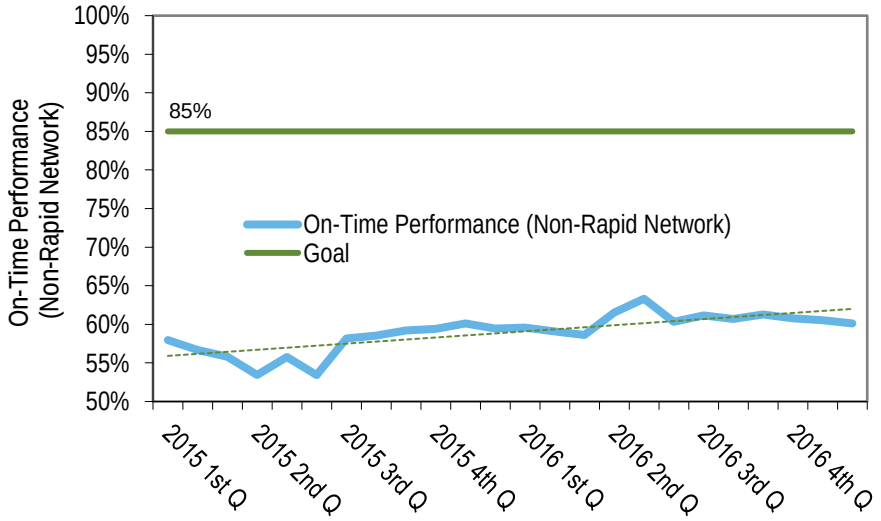
The quality of on-time performance data is expected to be more reliable with the new OrbStar CAD/AVL radio system, which will produce its own reporting separate from NextBus.

Recommendations

Expand reporting to show on-time performance by service category. This would help the public see any differences between the service categories in headway-based on-time performance.

FY 15-16 Performance	Trend
X Goal Not Achieved	✓ Positive

Audit Period Performance



Historic Performance

FY12 AVG	FY13 AVG	FY14 AVG	FY15 AVG	FY16 AVG
61.2%	59.9%	59.6%	57.4%	60.5%

2.2.3 Percentage of Scheduled Service Delivered (Trips)

Purpose

To measure the amount of service delivered.

Description: This measure reflects the percentage of scheduled trips that were filled by operators.

Method: The percentage of scheduled trips delivered is the percentage of filled runs (trips with an operator assigned to them) over total trips scheduled to be delivered, as reported in the Trapeze system.

Discussion

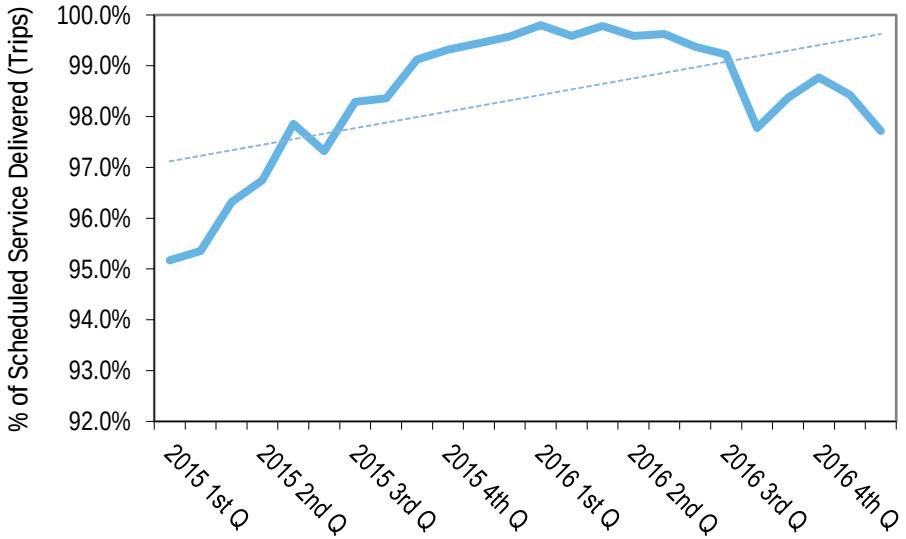
The City Charter specifies that actual service provided be measured against the scheduled service hours. This metric is similar, looking instead at the percentage of trips that actually left the yard compared to those scheduled. The percentage of scheduled service delivered by trips peaked at 99.8% in Q1 of FY 2016 for this audit period, starting from a low of 95.2% in Q1 of FY 2015. Since FY 2012, the percentage of scheduled service trips delivered has been over 96%, and continues to trend upward.

The quality of service delivery data is expected to be more reliable with the new OrbStar CAD/AVL radio system, which will produce its own reporting separate from Trapeze.

Recommendations

Discontinue this metric in favor of metric 2.2.9 Percentage of Scheduled Service Hours Delivered. Metric 2.2.9 is specified by the City Charter, and takes into account scheduled operators and equipment that is available for deployment. Metric 2.2.3 does not add more to the narrative to warrant its continuation.

FY 15-16 Performance	Trend
No Goal Established	✓ Positive



Historic Performance

FY12 Avg	FY13 Avg	FY14 Avg	FY15 Avg	FY16 Avg
96.8%	97.1%	96.4%	97.7%	98.9%

2.2.4 Percentage of On-Time Departures from Terminals

FY 15-16 Performance	Trend
X Goal Not Achieved	✓ Positive

Purpose

To measure system reliability.

Description: A vehicle is considered "on time" if it is between one minute early and four minutes late (-1 to 4 minutes). A terminal is the starting stop of each new revenue-service trip.

Method: Scheduled timepoint arrivals at the first timepoint in Trapeze are compared with actual arrival times at each trip's first timepoint using NextBus data.

City Charter Target: 85%

Discussion

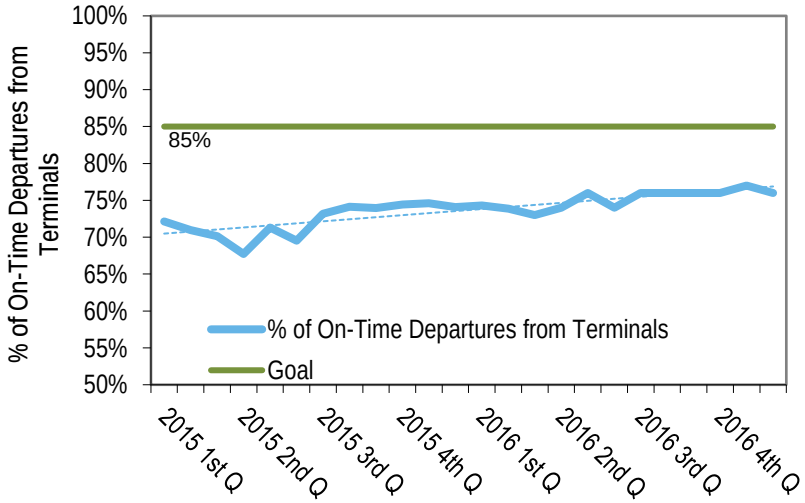
Over the course of the audit period, the percentage of on-time departures from terminals rose, but still fell short of the 85% Charter-mandated goal. The best performance occurred in Q4 of FY 2016, with 77.0% of trip departures beginning on-time. The audit-period low occurred in Q2 FY 2015 at 67.7%. The annual trend has been relatively steady, with a low in FY 2015 of 72.2% on-time departures from terminals during this audit. The FY 2016 average of 75.3% approached the five-year high of 76.9% in FY 2012.

The quality of on-time performance data is expected to be more reliable with the new OrbStar CAD/AVL radio system, which will produce its own reporting separate from NextBus.

Recommendations

Expand reporting to show on-time departures from terminals by service category. This will help customers see the difference in performance between service categories.

Audit Period Performance



Historic Performance

FY12 Avg	FY13 Avg	FY14 Avg	FY15 Avg	FY16 Avg
76.9%	73.7%	73.9%	72.2%	75.3%

2.2.6 Percentage of On-Time Performance (OTP)

FY 15-16 Performance	Trend
X Goal Not Achieved	✓ Positive

Purpose

To measure schedule adherence.

Description: The City Charter stipulates that 85% of vehicles must run on time. The definition of "on-time" is bus arrival between one minute early and four minutes late (-1 to 4 minutes), measured against a published time table.

Method: Scheduled timepoint arrivals in Trapeze are compared with actual arrival times at timepoints along each route using NextBus data.

City Charter Target: 85%

Discussion

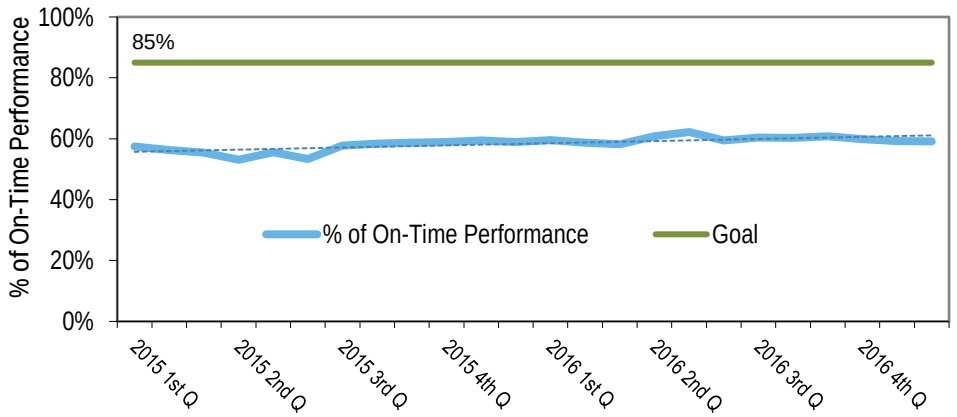
The SFMTA did not meet the Charter-mandated goal of 85% systemwide OTP during the audit period. Average OTP during the audit period rose slightly, fluctuating between a low of 53.1% in Q2 of FY 2015 to a high of 60.8% in Q2 of FY 2016. Annually, the SFMTA hovers between 57% and 60%. With Muni Forward policies in place to help Muni complete trips without obstruction, on-time performance is expected to increase in the coming years.

The quality of service delivery data is expected to be more reliable with the new OrbStar CAD/AVL radio system, which will produce its own reporting separate from Trapeze.

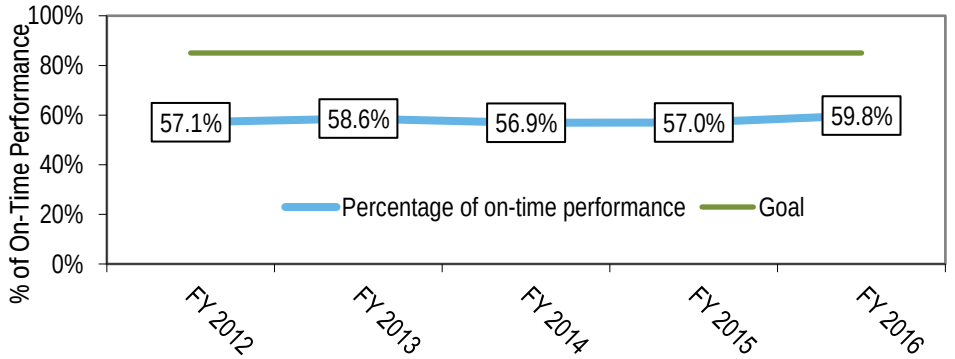
Recommendations

Rename the metric "Systemwide On-Time Performance" in the next Strategic Plan update. This is a more intuitive description of the metric**.**

Audit Period Performance



Historic Performance



2.2.7 Percentage of Trips Over Capacity During AM Peak (8:00a-8:59a, Inbound) at Max Load Points Percentage of Trips Over Capacity During PM Peak (5:00p-5:59p, Outbound) at Max Load Points

Purpose

To measure the level of crowding.

Description: This metric compares the number of people on board buses to the stated capacity of the vehicle for the assigned trip during the peak period.

Method: The SFMTA compares the highest passenger count of each bus trip from the on-board automatic passenger counters (APC) to the capacity of the vehicle scheduled for the trip. The percentage of trips over capacity equals the number of trips with a maximum load above reported capacity divided by the total number of trips. Data analyzed are from a one-hour period, inbound during the morning peak and outbound during the evening peak. The reported results represent the systemwide average.

Discussion

During this audit period, legacy APC devices on older buses were noted to undercount. The latest generation of APC devices are installed on all new buses, which should provide more accurate counts in the next audit cycle.

The percentage of trips over capacity has decreased. It is unclear whether this is due to successful Muni Forward projects, increased service, scheduling adjustments, or to gradual underreporting from legacy APC counts. For AM peak trips, a high of 8.1% of trips exceeded vehicle capacity at the max load point in Q2 of FY 2015, compared to a low of 2.0% of trips in Q4 of FY 2016. Trips over capacity during the PM peak hit a high of 7.2% of trips in Q1 of FY 2015 and a low of 1.3% of trips in Q4 of FY 2016. Historically, the trend for overcrowded trips has been positive since FY 2013.

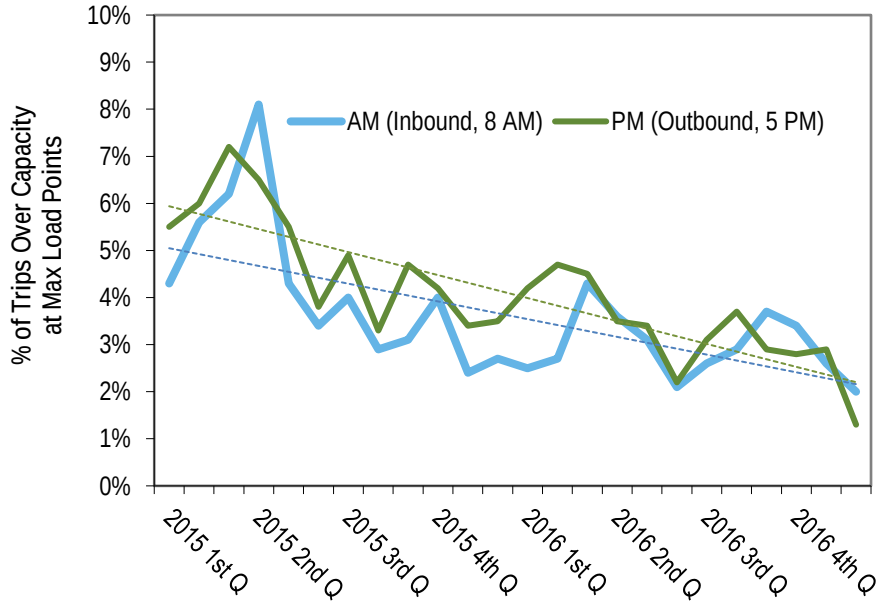
The quality of passenger load data is expected to be more reliable with the activation of new APC technology.

Recommendations

Expand reporting overcrowding by service category. The SFMTA should continue to report the systemwide averages, but add graphical representation of overcapacity by service category to show planners and the public whether—and to what degree—a Rapid route experiences crowding differently than a neighborhood Circulator. The SFMTA currently collects data for each route separately, so this would not change the input process.

FY 15-16 Performance	Trend
No Goal Established	✓ Positive

Audit Period Performance



Historic Performance

	FY12 Avg	FY13 Avg	FY14 Avg	FY15 Avg	FY16 Avg
AM	5.9%	7.4%	6.9%	4.3%	3.0%
PM	7.1%	8.6%	6.9%	4.9%	3.3%

2.2.8 Mean Distance Between Failure (MDBF)

Purpose

To measure the frequency of vehicle breakdowns and effectiveness of the preventative maintenance program.

Description: MDBF is a measure of reliability that expresses the average distance a vehicle travels before a mechanical failure occurs. It is reported by mode.

The metric stems from the Federal Transit Administration's definition of a "major mechanical system failure" as an element of a vehicle's mechanical system that prevents the vehicle from completing a scheduled revenue trip.

Incidents that occur during a deadhead or layover are also included in this measurement. Incidents that are not counted are called "nonchargable" and include damage from collisions, vandalism, and damage to ad signs for rail, with damage from collisions, sick passengers, vandalism, body damage, and broken windows excluded for buses.

Method: Generally, data come from the Central Control Log and the SHOPS asset management system. Data are compiled and submitted on a monthly basis in hard-coded, pre-summarized spreadsheets, but are processed differently between modes due to distinct needs and policies at each division.

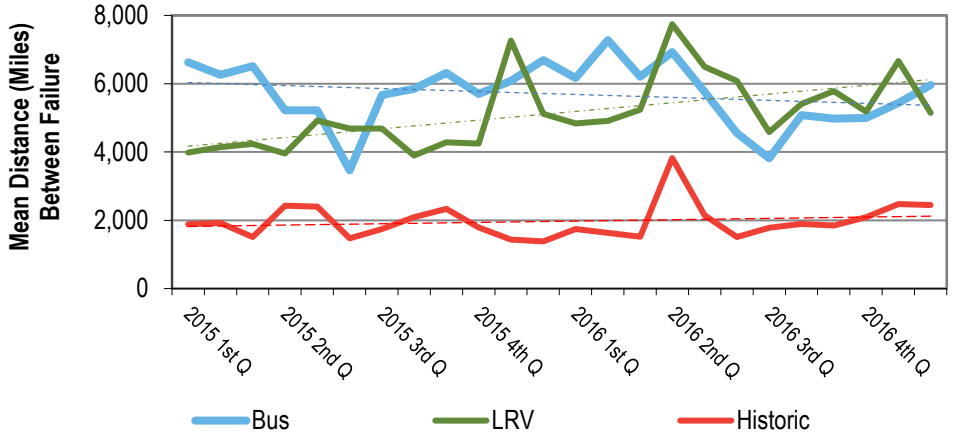
Buses: All verifiable *chargeable* mechanical defects are included as part of the mean distance between failure figure.

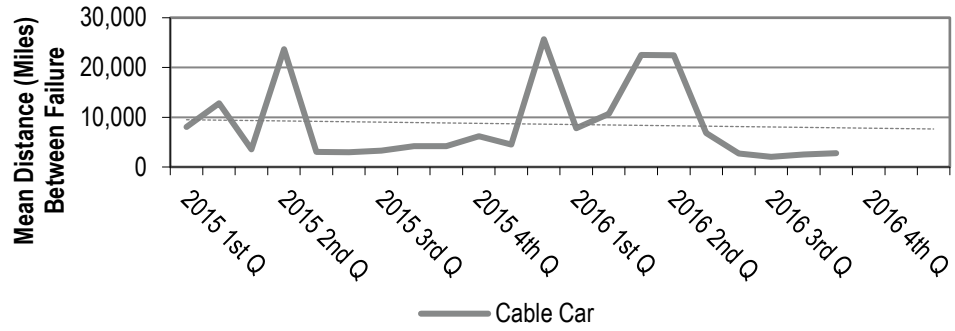
Light rail vehicles and historic streetcars: Chargeable failures are only included in the MDBF figure when the mechanical incident causes a line delay of five minutes or more, or causes a vehicle to not complete its run.

Cable cars: The definition for a "chargeable failure" has varied over the years, with the most recent definition including "brake, truck, electrical, and body" failures, as well as broken glass and a broken bell (as this is essential to the operation of the vehicle). However, recently, wooden track brake and grip failures have been considered operator-induced wear items and therefore not chargeable and not included in the MDBF calculation..

FY 15-16 Performance	Trend	
No Goal Established	Bus:	X Negative
	LRV:	✓ Positive
	Historic:	✓ Positive
	Cable Car:	✓ Positive

Audit Period Performance



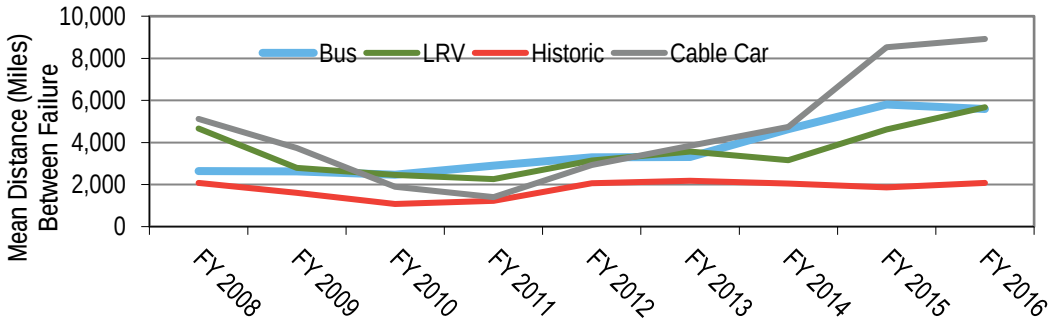


2.2.8 Mean Distance Between Failure (MDBF) *(Continued)*

Discussion

The City Charter calls for measures to report on the frequency and mitigation of vehicle breakdowns, as well as the effectiveness of the preventative maintenance program. These go hand-in-hand—an effective maintenance program is one way to mitigate vehicle breakdowns. MDBF is the metric used to track breakdown frequency. There are several major issues with this particular metric. First, although it is used for all modes, it is not an appropriate measure for cable cars, which have no mechanical components. Second, what constitutes a "failure" is subjective, and whether a vehicle is pulled from revenue service varies between garages and managers.

Historic Performance



- **Bus.** Major strides have been made since FY 2008, when the MDBF was just 2,645 miles. It peaked during the audit period with an average of 5,802 miles between failures, and fell to 5,596 in FY 2016. This is an improvement of 112%. During the current audit period there were two major low points, both during a winter month: December in Q2 of FY 2015 and January in Q3 of FY 2016.
- **Light rail.** Light rail performance improved during the audit period, with major spikes in MDBF in Q2 of FY 2016. In FY 2015, MDBF approached the high of FY 2008 performance, which then dropped in the following years. Light rail performance has improved 151% since its low in FY 2011 of an average of 2,258 miles between failures.
- **Historic streetcar.** Performance improved slightly during the audit period, helped primarily by a spike in Q2 of FY 2016. Without the outlier, the trend would still be positive, but flatter, with a 2.8% increase between FY 2015 and FY 2016. Historically, the trend has been positive since FY 2008, but relatively stable since FY 2012. Among bus, and rail, the historic streetcars have significantly lower mean distances between failures.
- **Cable Car.** Because cable car does not fit well into MDBF criteria, definitions and data collection efforts have been inconsistent. Data stopped being reported at the end of Q3 of FY 2016. Although the department has been tracking the useful life of cables, that alone is not a useful indicator to the public about the state of cable cars.

Recommendations

Use this metric for bus, light rail and historic streetcar only. This metric is most relevant for these modes. Discontinue reporting it for cable cars in lieu of a new metric.

Consider implementing a new metric "Preventative Maintenance: Percentage On-Time Completion" for the next Strategic Plan. This metric will address the effectiveness of the preventative maintenance program called for by the City Charter. The metric is an industry standard and the information is likely already being collected for federal state-of-good repair reporting requirements. The Performance Team should work with the appropriate staff to develop a framework with parameters to normalize success and failure (i.e. time, mileage, percentage of fleet).

2.2.9 Percentage of Scheduled Service Hours Delivered

FY 15-16 Performance	Trend
X Goal Not Achieved	✓ Positive

Purpose

To measure deployment of service and system reliability.

Description: The City Charter requires the amount of actual service delivered to be tracked.

Method: Using the Trapeze database, service hours are calculated by subtracting the trip start and end time for each trip. A trip is considered delivered if an operator is assigned to it. A trip with no operator is considered "unfilled." The cumulative scheduled service hours of filled trips is divided by the scheduled service hours of all trips.

City Charter Target: 98.5% of scheduled service hours delivered

Discussion

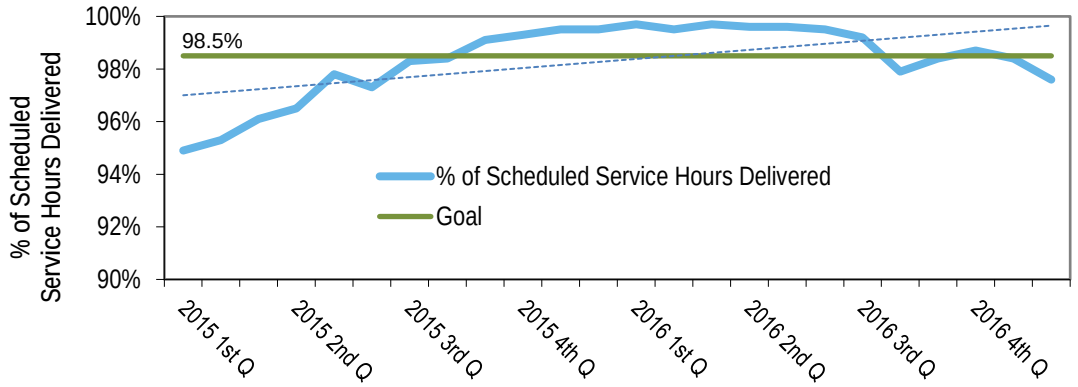
At the time Article VIIIA of the City Charter was published, this metric aimed to help address major driver shortages. Performance has trended upward since FY 2006. During the audit period, the SFMTA reached the City Charter target of 98.5% between Q3 of FY 2015 and Q2 of FY 2016. It reached a high of 99.7% twice in FY 2016. The SFMTA hit an audit period low in Q1 2015, delivering just under 95% of scheduled service.

The quality of service delivery data is expected to be more reliable with the new OrbStar CAD/AVL radio system, which will produce its own reporting separate from Trapeze.

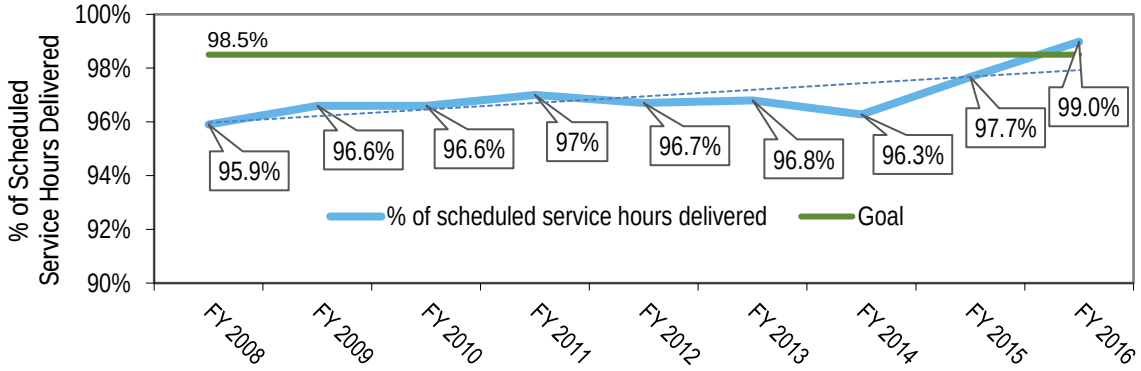
Recommendations

Transition data collection to OrbStar CAD/AVL radio system once it is available. This should enable tracking of actual performance against the scheduled service hours reported in Trapeze. Performance will likely initially drop due to more accurate reporting, but will be more accurately reflect the passenger experience.

Audit Period Performance



Historic Performance



2.2.11 Ridership (Bus and Metro Faregates, Average Weekday)

Purpose

To measure ridership.

Description: The average weekday system ridership on bus and at the Muni Metro fare gates. Systemwide ridership is also reported here.

Method: Average weekday ridership is separated by mode:

For buses, a sample-based analysis is conducted by the Transit Division. Over the course of a month, APC-equipped vehicles are randomly assigned to all routes to cover selected trips during different times of the day. The sample data are then used to extrapolate an estimate of overall bus ridership on a monthly basis, which is then summarized as a daily average.

For light rail vehicles, the monthly fare gate entries at Muni Metro stations are reported as a proxy for ridership, due to a lack of APC technology on board vehicles.

For cable cars and historic streetcars, estimates are produced annually based on manual ride checker observations.

Systemwide, uses sampling methodologies from National Transit Database reporting.

Discussion

Systemwide Muni ridership has increased, reaching a 12-year high of over 232 million riders in FY 2016, after a dip to 219 million in FY 2015.

Ridership is not a measure required by the City Charter, but it is a core industry metric, and it will replace the measure for economic impact on the City beginning in FY 2017.

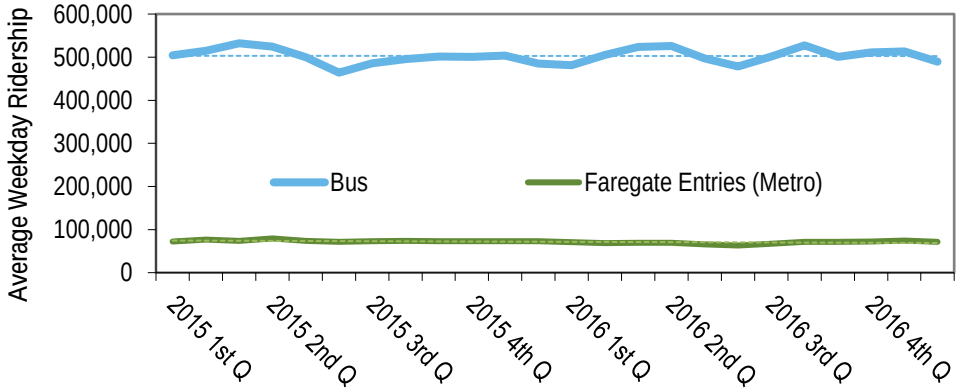
During this audit period, legacy APC devices on older buses were noted to undercount. These figures attempt to account for those issues. The latest generation of APC devices are installed on all new buses, which should provide more accurate counts in the next audit cycle. Public-facing reports still show average weekday ridership for buses and Muni Metro's faregate entries as relatively steady during the audit period.

Recommendations

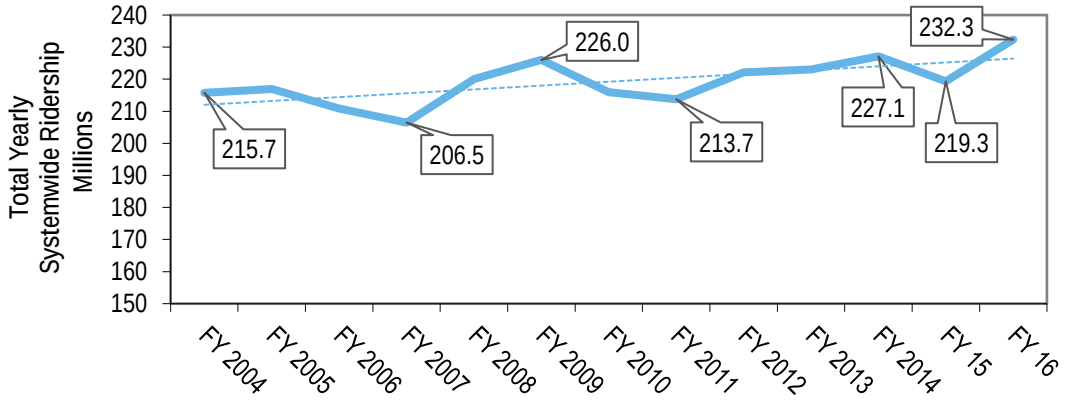
None.

	FY 15-16 Performance	Trend
System Wide Ridership	No Goal Established	✓ Positive

Audit Period Performance



Historic Performance



2.2.12 Percentage of Days that Elevators are in Full Operation
2.2.13 Percentage of Days that Escalators are in Full Operation

Purpose

To measure the effectiveness of the preventative maintenance program and reliability of Muni Metro station accessibility.

Description: Measures the availability of elevators and escalators when they are scheduled to be in operation, also known as "operational availability" in the industry.

Method: This metric is calculated by dividing the number of "in service" elevator and escalator records (in the SHOPS asset management database) by the number of total records on a monthly basis. SFMTA staff check escalator and elevator operation status on a daily basis through phone calls to station agents.

Discussion

Elevator or escalator downtime includes any time when an elevator or escalator is not available for use, regardless of whether it was an actual breakdown, scheduled for routine maintenance, or other testing.

All of the existing equipment was installed in the 1970s when Muni Metro was constructed. During the audit period, elevator availability rose slightly and dropped below 90% only twice. It hit a high of 98.6% in Q3 of FY 2016.

The decline in escalator performance in FY 2016 is attributed to the age of the assets and the modernization program. The modernization program results in two escalators being out at all times. During the audit period, escalator availability fell, with a high of 96.3% in Q1 FY 2015 and a low of 79.2% in Q3 FY 2016.

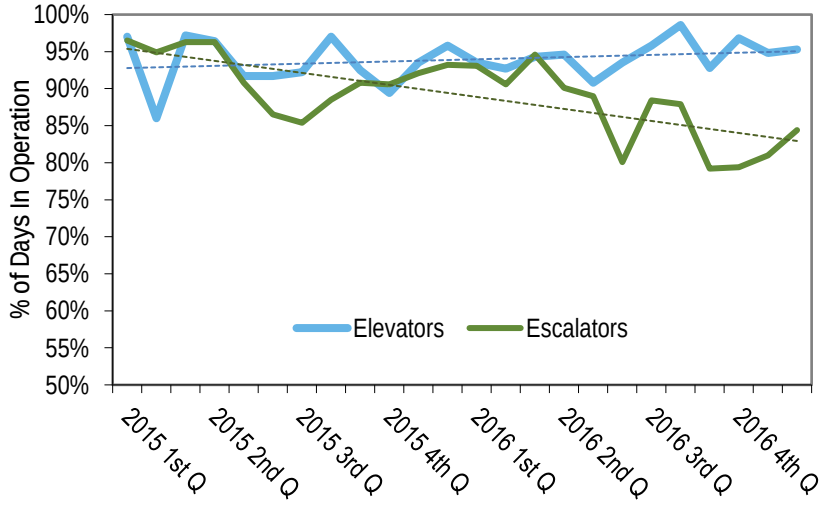
The annual trends of escalator operational availability has shown greater swings than elevators. This is partly due to data tracking practices that did not distinguish between service disruptions due to planned maintenance and those due to mechanical failures. Beginning in FY 2017, this distinction will be made in the maintenance reporting.

Recommendations

Rename metrics to "Operational Availability of Elevator/ Escalator" or "Time in Service of Elevator/Escalator" in the next Strategic Report. The current name "Days in Service" is not a user-friendly term.

FY 15-16 Performance	Trend	
No Goal Established	Elevators:	✓ Positive
	Escalators:	X Negative

Audit Period Performance



Historic Performance

	FY12 Avg	FY13 Avg	FY14 Avg	FY15 Avg	FY16 Avg
2.2.12 Elevators	93.6%	96.3%	94.4%	93.3%	94.5%
2.2.13 Escalators	94.2%	88.1%	93.8%	91.9%	86.5%

Goal 3: Improve the environment and quality of life in San Francisco

3.2.1 Estimated Economic Impact of Muni Service Delays (Annualized)

Purpose

To measure the economic impact of Muni service delays.

Description: This measure estimates the lost business and personal value of travel time to each rider due to major Muni service disruptions.

Method: The SFMTA Performance Team staff sources cable car and rail delay data from the OCC Logs, and based on route or line, time, and location, assign an approximate number of passengers affected by a route/line delay. Including only those delays 10 minutes or longer that are caused by Muni, staff estimate the potential hours of lost productivity due to the delay using the following equation: Economic impact of Muni service delays = (business value * peak hour delays) + (personal value * off-peak delays).

Discussion

Originally established at the request of the Board of Supervisors and defined by the City's Chief Economist, this measure is being phased out and replaced in FY 2017. Instead of the economic impact of Muni service delays, Muni will report ridership as the key indicator for the SFMTA's economic benefits to the city.

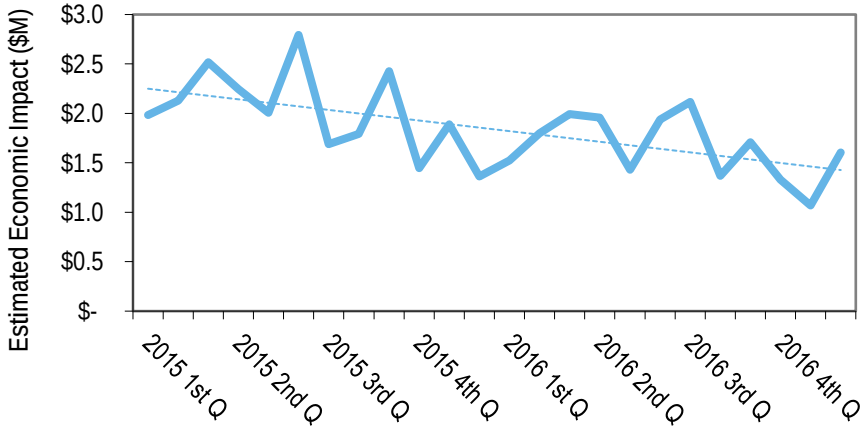
The average monthly economic impact of Muni delays fell from $3.65 million in FY 2013 to $1.65 million in FY 2016. The estimated economic impact in this audit period reached a high of $2.79 million in Q2 of FY 2015 and an audit period low of $1.07 million in Q2 FY 2016.

Recommendations

None. This measure has been phased out and will be replaced.

FY 15-16 Performance	Trend
No Goal Established	✓ Positive

Audit Period Performance



Historic Performance

FY13 Avg	FY14 Avg	FY15 Avg	FY16 Avg
$3.65 M	$2.97 M	$1.90 M	$1.65 M

3.4.1 Average Annual Transit Cost per Revenue Hour

FY 15-16 Performance	Trend
X Goal Not Achieved	X Negative

Purpose

To measure the efficiency of service delivery.

Description: This measure is the average fully allocated cost per hour of providing revenue service.

Method: Data are reported to the Board and to the National Transit Database on an annual basis based on fully allocated costs per hour of service by mode.

Strategic Plan FY 2016 Target: $192/hour, and a 5% reduction in fully allocated cost of transit service each budget cycle. The FY 2016 goal of $192 per revenue hour was adjusted to FY 2015 dollars.

Discussion

This metric is updated annually after the fiscal year is closed. The SFMTA currently reports real values, which is cost per hour data adjusted to the most recent reporting year's CPI deflator to ensure consistent comparability over time. Because of the time-lag associated with this metric, it is not one the agency acts upon, but it is useful as a fiscal metric to review.

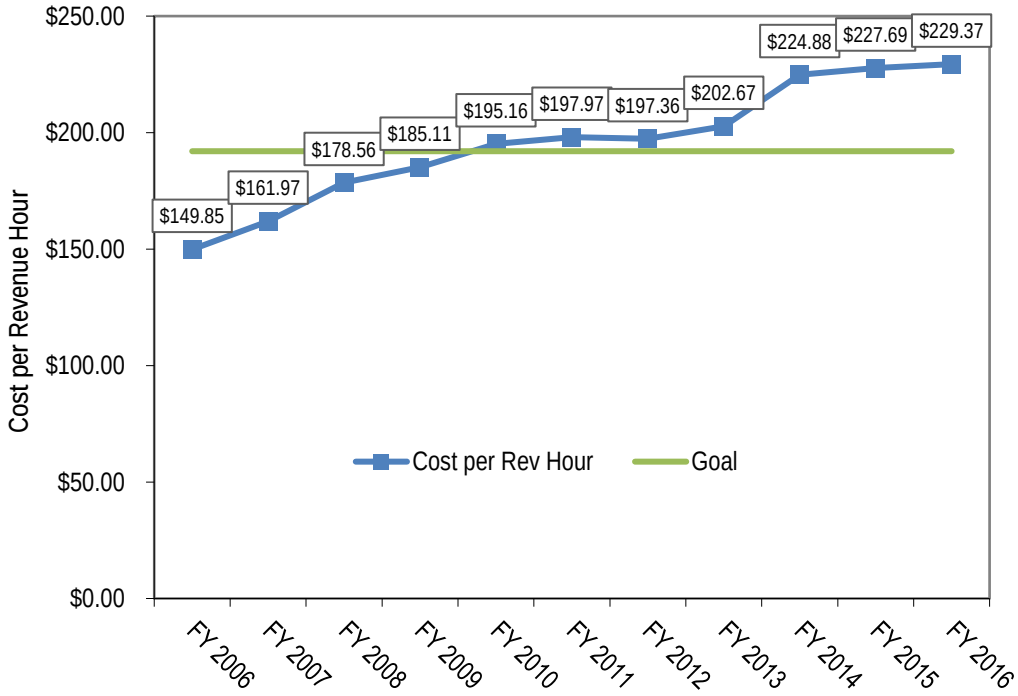
Cost per revenue hour continue to rise. That is at least in part because the cost of living in the Bay Area continues to grow. This metric is intended to help the agency "do less with more," but a better indicator to guide service improvement is metric 3.4.2 Passengers per hour because data are available for monthly reporting and thus better suited for timely business decisions. For this reason, the SFMTA adopted passengers per hour as the key indicator for efficient service delivery.

The average annual transit cost per revenue hour has increased every year since FY 2006 with the exception of FY 2012, but the rate of growth has slowed since FY 2014.

Recommendations

None.

Historic Performance



3.4.2 Average Passengers per Revenue Hour (Bus)

Purpose

To measure the productivity of Muni bus services.

Description: Measures the average number of boardings per revenue hour on Muni bus service.

Method: Passenger boardings based on both the manual passenger counts as well as APC data are divided by service hours delivered. Data are reported to the National Transit Database (NTD) on an annual basis.

Due to NTD reporting guidelines, the passengers per revenue hour is also non-revenue time, such as layover/recovery time at each terminal.

Discussion

Within the audit period, Muni's boardings per revenue hour were down in FY 2016. Average passengers per revenue hour for bus peaked in FY 2012 with an average of 68, and reached its lowest point in FY 2016 with an average 63 passengers per revenue hour.

Starting in FY 2017, after the close of this audit, the SFMTA began reporting passengers per platform hour on a monthly basis to provide more timely and actionable service efficiency insights.

Recommendations

None.

FY 15-16 Performance	Trend
No Goal Established	X Negative

Historic Performance

Current Audit Period

FY12 Avg	FY13 Avg	FY14 Avg	FY15 Avg	FY16 Avg
68.0	67.4	67.8	64.0	63.0

3.4.3 Cost per Unlinked Trip

FY 15-16 Performance	Trend
No Goal Established	X Negative

Purpose

To measure system performance.

Description: An unlinked (passenger) trip is another name for a passenger boarding. Cost per unlinked trip is the financial term used to measure cost effectiveness.

Method: Cost per unlinked trip is calculated by dividing operating expenses by the number of boardings. Data are reported to the National Transit Database on an annual basis.

Using nominal reporting does not in fact ensure comparability. Suggest replacing 'comparability' with 'reporting'. The SFMTA reports cost per unlinked trip data adjusted to the most recent reporting year's CPI deflator and changes the figures for prior years.

Discussion

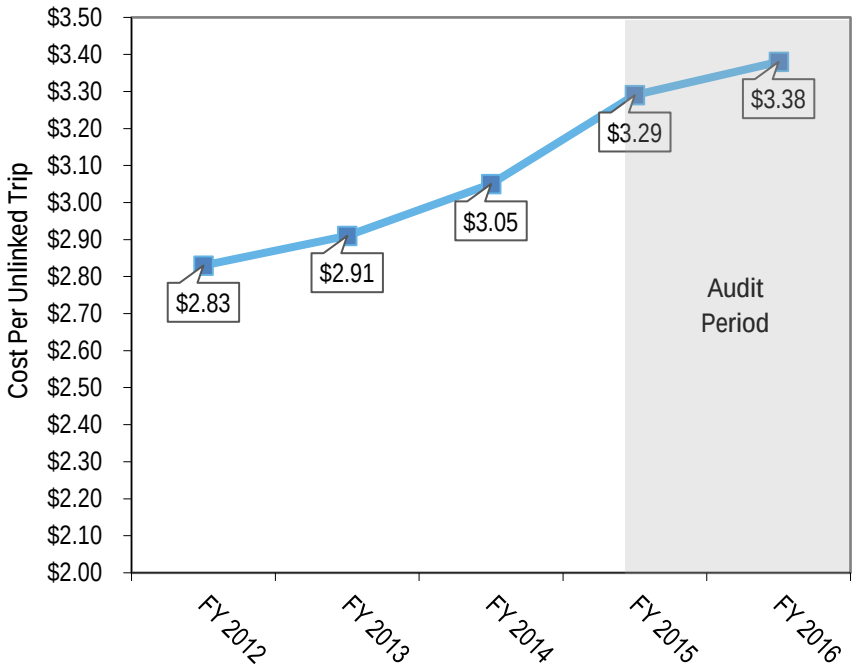
Muni began reporting this measure in Service Standards Reports in FY 2008. The metric is not related to any of the goals in the City Charter, but it is an industry standard reported to the Federal Transit Administration.

Muni's operating cost per unlinked trip has trended upwards over the past decade and continues to do so, but the rate of growth slowed between FY 2015 and FY 2016. Costs are up 19.4% since FY 2012, but rose only 2.7% between FY 2015 and FY 2016.

Recommendations

Rename this metric "Cost per Boarding" in the next Strategic Plan. Cost per boarding is much more intuitive to the public.

Historic Performance



3.4.5 Farebox Recovery Ratio

Purpose

To measure system efficiency.

Description: Farebox recovery ratio is the percentage of operating expenses covered by revenues from fares.

Method: This metric is measured by dividing Muni's total fare revenue by its total operating expenses. Data are reported to the National Transit Database on an annual basis.

Discussion

The farebox recovery ratio fell during this audit period. The downward trend may be partly attributed to policy decisions, such as the city's free muni programs for low income youth, seniors and people with disabilities. By the end of the audit period, nearly 100,000 customers were enrolled in these free Muni programs.

Recommendations

None.

FY 15-16 Performance	Trend
No Goal Established	X Negative

Historic Performance

Audit Period

FY12 Avg	FY13 Avg	FY14 Avg	FY15 Avg	FY16 Avg
32%	34%	30%	30%	26%

Goal 4: Create a workplace that delivers outstanding service

4.2.1 Employee Satisfaction

FY 15-16 Performance	Trend
No Goal Established	○ Neutral

Purpose

To measure employee satisfaction.

Description: This metric tracks employee satisfaction for all staff at the SFMTA in the agency's annual employee engagement survey.

Method: Employees are asked to complete 25 survey questions that cover three themes related to personal experience, supervisor relationships, and perception of leadership. Surveys were emailed to employees with email addresses, and beginning with the FY 2016 survey, were mailed to the home addresses for employees without email addresses. To assess employee satisfaction, respondents are asked, "What is your overall satisfaction as an employee of the Agency?" and offered five response options ranging from very dissatisfied (1) to very satisfied (5). Responses are then weighted by the employee's division response factor and reported as an average on a 1 to 5 scale. The survey is administered by SFMTA staff and agency-wide response rates have ranged from 33% to 27% over the years.

Historic Performance

FY13 Avg	FY14 Avg	FY15 Avg	FY16 Avg
3.4	3.4	3.4	3.4

Discussion

The City Charter calls for a measurable standard to track employee satisfaction. The fourth annual agency-wide survey, published in January 2017, represents employee experiences from 2016. Overall satisfaction has not changed over the past four years, with the average rating of 3.4 on a scale of 1 to 5.

Employee satisfaction among respondents with customer-facing jobs, such as transit operators, averaged 3.0, neither satisfied nor dissatisfied. This is 0.9 points lower than the 3.9 satisfaction rating among those who had jobs with office staff.

Recommendations

Improve response rates to the survey. While the overall agency response rate is in line with average employee survey response rates and strides have been made to increase responses among frontline and other field staff, responses from these groups remain relatively low compared with office staff. Efforts should be made to achieve high response rates consistently across employee groups.

Change the annual survey frequency to biennial and hire a professional firm to conduct the survey. As evidenced by the lack of movement in the satisfaction ratings from year to year, an annual survey frequency has not yielded a high level of actionable insight. The SFMTA should hire a professional survey research firm to conduct the survey once every two years to improve the quality of data collection and give SFMTA management adequate time to develop and implement programming based on the survey's findings.

4.3.3 Unscheduled Absence Rate by Transit Operators

FY 15-16 Performance	Trend
No Goal Established	X Negative

Purpose

To measure service delivery.

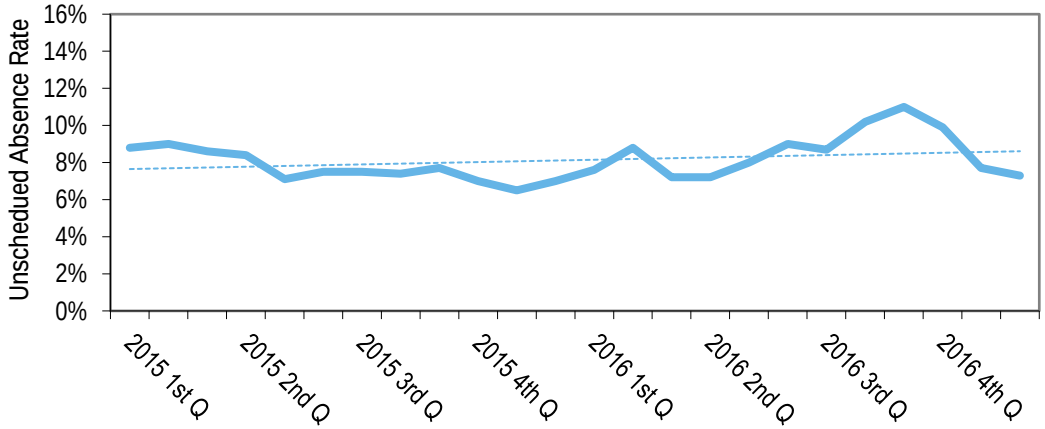
Description: This metric tracks the unscheduled absences of transit operators.

Method: Unscheduled absences are hard-coded in Trapeze in a number of categories: sick pay/leave; long-term leave; suspensions; leave covered by the Family and Medical Leave Act (FMLA); late arrivals to work, which are called working miss outs; and absent all day (AWOL). Using data sourced from the Trapeze scheduling system, the percentage of scheduled operators who have an unscheduled absence is calculated by dividing the number of operators with unscheduled absences by the total number of daily bid operators.

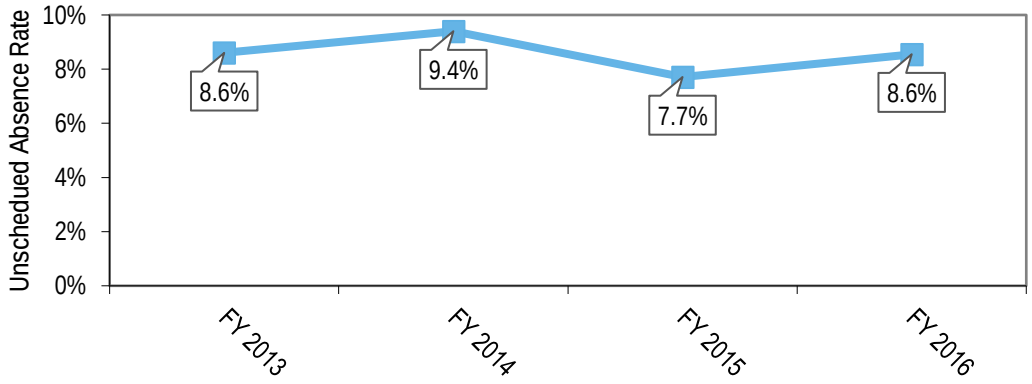
Discussion

Unscheduled absenteeism has always been higher among operators than positions in other departments throughout the agency. Measuring the unscheduled absence rate of transit operators helps to illustrate how labor availability effects service delivery.

Audit Period Performance



Historic Performance



4.3.3 Unscheduled Absence Rate by Transit Operators *(Continued)*

Discussion *(Continued)*

Unscheduled absences may be double-, or in some cases triple-counted, due to a Transit Operations business practice of assigning multiple codes to unscheduled absences. An example would be an employee with an expired driver's license and expired medical documentation who is also on FMLA; in Trapeze, their absence would be coded for each of these categories.

Transit operator absenteeism fell in FY 2015 to an average of 7.7% for the year, but rose again in FY 2016 to 8.6%. During the audit period, unscheduled operator absences hit a low of 7.0% in Q1 of FY 2015, and a high of 11.0% in Q3 of FY 2016.

Recommendations

Expand reporting to all the SFMTA staff and track absence rates through the PeopleSoft payroll system. A recent upgrade to the City's PeopleSoft payroll system was made to enable the removal of long-term leave timekeeping from absence rate reporting. This should enable the SFMTA to accurately report absence rates for all employee groups. Operator timekeeping data from Trapeze is automatically transmitted to the PeopleSoft payroll system, so the reporting between the two systems should be consistent. Reports can be generated for hours worked and leave hours taken.

Chapter 4 Operations Analysis

In addition to evaluating Muni's "service standards" reporting, the Municipal Transportation Quality Review (MTQR) provides a high-level assessment of Muni's performance over a two-year period. Beginning with the FY 2007-2008 Quality Review, a more detailed operational analysis focused on Muni's transit performance, conducted concurrently with the audit process. These analyses, typically based on a review of available data and a series of informational meetings with SFMTA staff, conclude with specific recommendations that SFMTA transit operations staff may use to improve transit performance.

Recent Operations Analyses have focused on Muni's reliability and capacity, and in the last two years Muni Forward was implemented to address these issues. Aiming to make route changes and service improvements based on reallocating limited resources, significant bus service increases have been implemented (both motor coach and trolley coach) to meet latent ridership demand and to embrace the opportunity to optimize capacity. The FY 2015-2016 Operations Analysis will review the SFMTA's quality control plans as a new state-of-the-art Transit Management Center (TMC) comes online, replacing the Operations Control Center (OCC).

BACKGROUND

The methods of controlling service delivery and deploying personnel are changing significantly with the new TMC operations. The increase in scheduled service hours over the past two years underscores the need to effectively allocate limited staff resources, while improving service reliability and performance. Under the Muni Forward Program, Muni has rescheduled routes to provide more service in trunk corridors and shift resources to heavily-patronized routes. A comparison of scheduled service between 2014 and fall 2016 is shown in Figure 4-1.

Figure 4-1 Change in Scheduled Service Hours 2014 – 2016

Mode	2014 Hours	2016 Hours	Percent Change
Bus (motor coach)	1,536,355	1,815,885	18%
Bus (trolley coach)	981,175	976,539	0%
Light rail vehicle	381,242	399,765	5%
Historic street car	111,272	128,367	15%
Cable car	150,865	150,903	0%
Total	3,160,909	3,471,459	10%

Source: SFMTA Transit Performance Team

FINDINGS

TMC and Field Coordination

As the SFMTA implements the long-planned TMC facility, the importance of establishing protocols for management and staff of all transportation units is essential. It is imperative that clarification of chain-of-command authority be established as the TMC comes on line. As past authority was vested in OCC to coordinate field functions, TMC management should also be clear that control and orders be initiated with full responsibility vested in 9153/9160 personnel.

At the time of this evaluation, TMC personnel were in the process of developing detailed standard operating procedures intended to cover operation of the radio system, handling of incidents and communication protocols both to operators and field supervisors and internally to TMC management and staff. Such coordination is critical to ensuring that the technology is leveraged to produce substantial performance gains. An explicit procedure manual and consistency will be key factors in improving service delivery.

In addition to clarifying the chain of command, protocols clarifying violation generation should also be promulgated. The technology available at TMC will enable controllers to communicate directly with operators and intervene in potential schedule violations; likewise, situations resulting in verifiable schedule violations should be initiated at TMC. Discussion and agreement on procedures with Transport Workers Union Locals 250A and 200 should be a priority.

RECOMMENDATIONS

1. Develop and document the chain of command

Define protocols for roles and responsibilities in the chain of command. The Chief Transportation Officer and senior operations managers should outline how the functions of the TMC interact with street and MRO supervisors, clarifying the roles and responsibilities of #9160 Transit Operations Specialist personnel assigned to the field and establishing appropriate lines of authority.

2. Update the philosophy of staffing coverage

The philosophy of staffing coverage for bus and rail units should be reviewed and updated. A quantitative analysis of the incident log by mode and by day of week as well as OTP trend data should guide possible revisions in that plan. Short-term 2015-2017 capacity improvements in light rail and F-Line corridors should be pursued.

3. Set protocols for communicating data

Generate protocols for prioritizing and communicating daily and weekly field staffing. The types of data informing the analysis and the resulting decision criteria should be transparently communicated. At a minimum, protocols should be developed for:

- The TMC log
- On-time performance,
- Passenger service reports, and
- Automatic passenger counts

4. Clarify Protocols for Generating Operator Violations

When an operator violates a contract rule, they are written up. Violations have historically been generated by field supervisors or the OCC. With the new TMC, it will be important to clarify who is responsible for generating violations. Division Superintendents and their staff must be diligent in processing service incident violations in order to improve on-street schedule adherence by operators. The implementation of a violation tracking system is important to ensure that originators (TMC or field) are informed of dispositions, manager review, and feedback.

5. Adopt Additional Requirements for #9139 Transit Supervisor Position

As #9139 Transit Supervisor personnel are hired or appointed, cross training in bus and rail operations should be mandatory. A requirement to have a DMV Class B license – certification to move revenue vehicles – should be adopted.

APPENDIX A

GLOSSARY OF TERMS

ACRONYMS

APC – Automatic passenger counters

AVL – Automatic vehicle location system

AWOL – Absent without leave

CAD – computer aided dispatch

CPI – Consumer price index

FMLA – Family and Medical Leave Act

Infor EAMS – Asset management database, which is replacing SHOPS

MDBF – Mean distance between failure

NTD – National Transit Database

OTP – On-time performance

OCC – Operations control center (Muni's former control center)

PSR – Passenger service report

SFPD – San Francisco Police Department

SHOPS – Asset management data system, being phased out for the new Infor EAMS application

SIE – SFMTA Security, Investigations, & Enforcement

TMC – The Transportation Management Center, began operation in 2017

VTP – Volunteer transfer program.

WC – Worker's compensation

DEFINITIONS

Bunching – Transit trips that have less than a 2-minute spacing between vehicles by route

City Charter – The San Francisco Municipal Code, first established in July 1996, and last amended by voters during the November 2016 election

Gaps – Transit trips where gaps in service exceed scheduled headway by more than five minutes by line and route

Mean distance between failure – Measure of reliability that expresses the average distance a vehicle travels before a mechanical failure occurs (reported by mode)

NextBus – The SFMTA's real-time arrival information service provider for all of Muni's fixed-route transit services

OrbStar CAD/AVL radio system – A new radio system that will integrate all onboard system reporting

Safety versus security – Protection from injuries vs. protection from crime

Trapeze – Software used by the SFMTA to develop and maintain routes and schedules