

# **Triennial Performance Audit**

*of the*

## **San Francisco Municipal Transportation Agency (SFMTA)**

**Fiscal Years 2015/16, 2016/17 and 2017/18**

**FINAL AUDIT REPORT**

*prepared for the*



**METROPOLITAN  
TRANSPORTATION  
COMMISSION**

*by*



**Pierlott & Associates, LLC**  
*Management Consulting*

**June 2019**

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NOTE:

*All exhibits in this report are presented at the end of the associated discussion in each section.*

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## EXECUTIVE SUMMARY

This executive summary highlights the findings from the performance audit of the San Francisco Municipal Transportation Agency (SFMTA). In California, a performance audit must be conducted every three years of any transit operator receiving Transportation Development Act (TDA) Article 4 funds, to determine whether the operator is in compliance with certain statutory and regulatory requirements, and to assess the efficiency and effectiveness of the operator's services. SFMTA operates five different transit modes: motor coach, trolley coach, light rail/historic trolley, cable car, and paratransit. The audit period is Fiscal Years 2016 through 2018 (from July 1, 2015 through June 30, 2018).

### **Performance Audit and Report Organization**

The performance audit was conducted for MTC in accordance with its established procedures for performance audits. The final audit report consists of these sections:

- An assessment of data collection and reporting procedures;
- A review of performance trends in TDA-mandated indicators and component costs;
- A review of compliance with selected PUC requirements;
- An evaluation of SFMTA's actions to implement the recommendations from the last performance audit;
- An evaluation of functional performance indicator trends; and
- Findings, conclusions, and recommendations to further improve SFMTA's performance based on the results of the previous sections.

Comments received from SFMTA and MTC staff regarding the draft report have been incorporated into the final report. Highlights from the key activities are presented in this executive summary.

## **Results and Conclusions**

Review of TDA Data Collection and Reporting Methods - The purpose of this review is to determine if SFMTA is in compliance with the TDA requirements for data collection and reporting. The review is limited to the five data items needed to calculate the TDA-mandated performance indicators. This review has determined that SFMTA is in compliance with the data collection and reporting requirements for these performance indicators. In addition, most of the statistics collected over the six-year review period appear to be consistent with the TDA definitions, and indicate general consistency in terms of the direction and magnitude of the year-to-year changes across the statistics.

However, it was observed that in the earlier years, there were reported declines in motor coach and especially trolley coach ridership that SFMTA suggested did not reflect actual ridership trends but resulted from measurement errors with the aging automatic passenger counters (APCs). This may also have had an impact in the later years, specifically where reported trolley coach passenger levels declined sharply toward the end of the current audit period.

Further, a change in data methodology to more accurately capture missed service through enhanced use of the Central Control Logs and the Automatic Train Control System (ACTS) resulted in significantly reduced car service hours and miles being reported for light rail starting in FY2014 and cable car in FY2015.

Performance Indicators and Trends – SFMTA’s performance trends for the five TDA-mandated indicators were analyzed by mode. A six-year analysis period was used for all the indicators. In addition, component operating costs were analyzed.

- Motor Coach – The following is a brief summary of the TDA performance trend highlights over the six-year period of FY2013 through FY2018:
  - There was an average annual increase in the operating cost per hour of 0.7 percent, which amounted to a 2.1 percent decrease in inflation adjusted dollars.
  - The cost per passenger increased on average by 2.8 percent per year, which amounted to steady performance (\$2.65 per passenger) when expressed in constant FY2013 dollars.
  - Passenger productivity exhibited a downward trend. Passengers per vehicle service hour and mile declined by 2.1 percent and 1.1 percent per year on average, as service levels increased at a moderately higher rate than passengers.
  - Employee productivity decreased an average 2.1 percent per year.

The following is a brief summary of the component operating costs trend highlights for the motor coach service between FY2013 and FY2018:

- The most significant change was an average annual increase of more than 27 percent in the casualty/liability area. In addition, a negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
- Labor costs represented the largest portion of the total costs, with a share that generally increased from 36 percent to 40 percent over the six years. Fringe benefits comprised the second largest portion, ranging between 31 and 35 percent during the review period. Labor and fringe benefits costs both increased by 7.7 percent on average per year.

- Materials/supplies costs generally decreased over the period from 16 to eight percent of total costs, and other cost categories each generally contributed 13 percent or less.
- Trolley Coach – The following is a brief summary of the TDA performance trend highlights over the six-year period of FY2013 through FY2018:
  - There was an average annual increase in the operating cost per hour of 6.6 percent, or 3.6 percent in inflation adjusted dollars. Operating expenses increased by 4.4 percent per year overall, while vehicle service hours were reduced by two percent at the same time.
  - The cost per passenger increased on average by 10.5 percent per year, which amounted to an average annual increase of 7.4 percent in constant FY2013 dollars. The cost per passenger increased, by at least eight percent, in every year except FY2016. Operating costs generally continued to rise while passenger levels declined significantly, especially toward the end of the period.
  - Passenger productivity declined as well, with passengers per vehicle service hour decreasing by 3.5 percent per year overall, and passengers per vehicle service mile decreasing by 2.8 percent.
  - Employee productivity decreased an average 5.1 percent per year.

The following is a brief summary of the component operating costs trend highlights for the trolley coach service between FY2013 and FY2018:

- The most significant change was an average annual increase of 21.5 percent in the casualty/liability area. In addition, a negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
- Labor costs represented the largest portion of the total costs, with a share that ranged between 40 and 45 percent over the six years. Fringe benefits comprised the second largest portion, remaining at about 35 percent during the review period. Labor and fringe benefits costs both increased by about 4.5 percent on average per year.

- Materials/supplies costs generally decreased over the period, by 7.5 percent per year on average. At the same time, services and “other expenses” increased by about six and 14 percent per year on average, respectively.
- Light Rail – The following is a brief summary of the TDA performance trend highlights over the six-year period of FY2013 through FY2018:
  - There was an average annual increase in the operating cost per hour of five percent, or 2.1 percent in inflation adjusted dollars. Operating expenses increased by 4.9 percent per year overall, while car service hours were reduced by less than one percent at the same time.
  - The cost per passenger increased on average by 3.6 percent per year, which amounted to an average annual increase of 0.7 percent in constant FY2013 dollars. The cost per passenger increased primarily toward the end of the review period, as operating costs continued to increase while passenger levels began to decline somewhat.
  - Passenger productivity improved over the period, with passengers per car service hour increasing by 1.4 percent per year overall, and passengers per car service mile increasing by 1.6 percent.
  - Employee productivity decreased an average 5.3 percent per year.

The following is a brief summary of the component operating costs trend highlights for the light rail service between FY2013 and FY2018:

- The most significant change was an average annual increase of nearly 23 percent in the casualty/liability area. In addition, a negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
- Labor costs represented the largest portion of the total costs, with a share of about 40 percent over the six years. Fringe benefits comprised the second largest portion, remaining in a range of 30 to 35 percent during the review period. Labor and fringe benefits costs both increased by about six percent on average per year.

- Materials/supplies costs generally decreased over the period, by 2.2 percent per year on average. At the same time, services and “other expenses” increased by about five and 12 percent per year on average, respectively.
- Cable Car – The following is a brief summary of the TDA performance trend highlights over the six-year period of FY2013 through FY2018:
  - There was an average annual increase in the operating cost per hour of 5.1 percent, or 2.1 percent in inflation adjusted dollars. Operating expenses increased by more than five percent per year overall, while car service hours went up by less than one percent.
  - The cost per passenger increased on average by 7.3 percent per year, which amounted to an average annual increase of 4.3 percent in constant FY2013 dollars. The cost per passenger increased primarily in the middle years of the review period, by more than 20 percent in both FY2015 and FY2016.
  - Passenger productivity declined somewhat over the period, with passengers per car service hour decreasing by 2.1 percent per year overall, and passengers per car service mile decreasing by 1.5 percent.
  - Employee productivity decreased an average 2.6 percent per year.

The following is a brief summary of the component operating costs trend highlights for the cable car service between FY2013 and FY2018:

- The most significant changes were average annual increases of 23 percent in the services area and 13 percent in casualty/liability costs. In addition, a negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
- Labor costs represented the largest portion of the total costs, with a share of about 50 percent over the six years. Fringe benefits comprised the second largest portion, remaining at just over 40



percent during the review period. Labor and fringe benefits costs both increased between five and six percent on average per year.

- Materials/supplies costs generally decreased over the period, by 5.3 percent per year on average. At the same time, “other expenses” increased by about seven percent per year on average, but remained a very small portion of total costs.
- Paratransit (Excluding Taxi) – The following is a brief summary of the TDA performance trend highlights over the six-year period of FY2013 through FY2018:
  - There was an average annual increase in the operating cost per hour of 5.8 percent, or 2.8 percent in inflation adjusted dollars. Operating expenses increased by ten percent per year overall, while vehicle service hours went up just four percent.
  - The cost per passenger increased on average by 16.1 percent per year, which amounted to an average annual increase of 12.9 percent in constant FY2013 dollars. The cost per passenger increased substantially in each year, as operating costs continued to climb but passenger levels steadily declined.
  - Passenger productivity also declined significantly over the period, with passengers per vehicle service hour decreasing by 8.9 percent per year overall, and passengers per vehicle service mile decreasing by 6.6 percent.

The following is a brief summary of the component operating costs trend highlights for the paratransit service between FY2013 and FY2018:

- Total annual costs increased by ten percent on average, driven by a corresponding increase in purchased transportation costs – by far the largest component cost category. Purchased transportation costs continued to be the source of about 98 percent of all costs in all six years.
- In-house labor and fringe benefits costs both increased about 15 percent on average per year. Costs in several other categories

showed significant percent changes as well, but they comprised a very small portion of the total costs.

- No casualty/liability costs were reported in the first three years, and no services costs were reported in the last three years. A negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.

Compliance with Statutory Requirements – SFMTA is in compliance with the sections of the state PUC that were reviewed as part of this performance audit. The sections reviewed included requirements concerning CHP safety inspections, labor contracts, reduced fares, Welfare-to-Work, revenue sharing, and evaluation of passenger needs.

Status of Prior Audit Recommendations – One of the two recommendations has been implemented. Through the current audit period and beyond, SFMTA Paratransit has been using automatically generated data to report all SF Access and Intercounty trips while using a limited manual validation for all electronically reported Group Van trips. It appears that the previous reporting discrepancies have been eliminated and paratransit passenger trip data is now consistent and accurate across all reporting systems.

Implementation is in progress for the remaining recommendation. Efforts are continuing toward obtaining accurate results from SFMTA's automatic passenger counters. SFMTA is in the process of moving from its original autonomous APC data collection system to an APC system developed by Conduent, Inc., and is working on a suite of analytical tools to monitor the APC system data and identify glitches and speed up remedies. Further, SFMTA is nearing completion of a major APC validation effort that compares APC counts with manual counts.

Functional Performance Indicator Trends - To further assess SFMTA's performance over the past three years, a detailed set of systemwide and modal functional area performance indicators was defined and reviewed.

- Systemwide (All Modes) – The following is a brief summary of the systemwide functional trend highlights between FY2016 and FY2018:
  - Administrative costs comprised between 18 and 20 percent of total operating costs, and increased from \$41 to \$45 per vehicle service hour.
  - Marketing costs increased compared to total administrative costs and also relative to passenger trips.
  - The systemwide farebox recovery ratio declined steadily from 25.7 percent to 23.7 percent.
  
- Motor Coach – The following is a brief summary of the motor coach functional trend highlights between FY2016 and FY2018:
  - Service Planning results showed a 15 percent increase in the cost per passenger mile, steady performance in the portions of vehicle miles and hours in service, and the farebox recovery ratio increasing overall to 26.3 percent by FY2018.
  - Operations results showed some increase in operating costs incurred from vehicle operations, and a net increase in vehicle operations costs per hour. Operator scheduled absences were steady at about ten percent of total hours worked, while unscheduled absences remained at about 4.5 percent. Schedule adherence went down from 61 to 57 percent, while missed trips were up to 2.8 percent in FY2018. At the same time, the rate of complaints was reduced.
  - Maintenance results showed a reduction in total maintenance costs to 21 percent of the total operating costs, vehicle maintenance costs per mile decreasing by 18 percent, the vehicle spare ratio increasing steadily to 25 percent in FY2018, and improvement in the mechanical failure rates. In addition, mechanic pay hours decreased compared

to vehicle service hours, while maintenance employee scheduled and unscheduled absences remained near 12 percent and five percent of total work hours.

- Safety results showed the preventable accident rate increasing slightly, casualty/liability costs per service hour and mile both increasing by more than 40 percent overall, and some reduction in lost time due to industrial accidents in FY2018.
- Trolley Coach – The following is a brief summary of the trolley coach functional trend highlights between FY2016 and FY2018:
  - Service Planning results showed a 45 percent increase in the cost per passenger mile, steady levels of vehicle miles and hours in service, and the farebox recovery ratio decreasing to 22.5 percent by FY2018.
  - Operations results showed some increase in operating costs incurred from vehicle operations, and an increase in vehicle operations costs per hour. Operator scheduled absences were steady at about ten percent of total hours worked, while unscheduled absences decreased somewhat to 4.1 percent. Schedule adherence went down from 65 to 62 percent, while missed trips were up to two percent in FY2018. At the same time, the overall rate of complaints was relatively steady.
  - Maintenance results showed a reduction in total maintenance costs to 24 percent of the total operating costs, vehicle maintenance costs per mile increasing by 2.5 percent overall, the vehicle spare ratio near 40 percent in both FY2016 and FY2018, and significant improvement in the mechanical failure rates. In addition, mechanic pay hours increased slightly compared to vehicle service hours, while maintenance employee scheduled and unscheduled absences remained near 11 percent and four percent of total work hours.
  - Safety results showed some increase in the preventable accident rate, and casualty/liability costs per service hour and mile both increasing by more than 50 percent overall. Meanwhile, there were significant reductions in lost time due to industrial accidents.

- Light Rail – The following is a brief summary of the light rail/historic trolley functional trend highlights between FY2016 and FY2018:
  - Service Planning results showed a 10.9 percent increase in the cost per passenger mile, virtually all car miles and hours in service, and the farebox recovery ratio decreasing to 18.2 percent by FY2018.
  - Operations results showed a moderate increase to 35 percent of operating costs incurred from vehicle operations, and a 15 percent increase in vehicle operations costs per hour. Operator scheduled absences were steady at 11 percent of total hours worked, while unscheduled absences decreased from five to four percent. Schedule adherence went down from 50 to 43 percent, while missed trips were up to 2.3 percent in FY2018. At the same time, the overall rate of complaints was relatively steady.
  - Maintenance results showed some decrease in the operating costs incurred from maintenance activities (vehicle and non-vehicle), vehicle maintenance costs of \$15 per mile and a vehicle spare ratio of 21.1 percent at the beginning and end of the audit period, and a slight decline in the rate of major mechanical failures but a significant improvement when looking at all failures. In addition, mechanic pay hours remained just under 50 percent of car service hours, while maintenance employee scheduled and unscheduled absence rates were both reduced somewhat.
  - Safety results showed some increase in the preventable accident rate, and casualty/liability costs per service hour and mile both increasing by about 45 percent overall. Meanwhile, there were significant reductions in lost time due to industrial accidents.
- Cable Car – The following is a brief summary of the cable car functional trend highlights between FY2016 and FY2018:
  - Service Planning results showed the cost per passenger mile remaining at about \$8.60, virtually all car miles and hours in service, and the farebox recovery ratio decreasing to less than 40 percent by FY2018.

- Operations results showed a relatively steady trend in operating costs incurred from vehicle operations, but a 7.7 percent overall increase in vehicle operations costs per hour. Operator scheduled absences were steady at about 12 percent of total hours worked, with unscheduled absences at 4.7 percent. Missed trips were down moderately to 0.9 percent in FY2018, and the rate of complaints decreased steadily.
- Maintenance results showed little change in the portion of operating costs incurred from maintenance activities (vehicle and non-vehicle), vehicle maintenance costs of about \$35 per mile at the beginning and end of the audit period, a steady 32.5 percent vehicle spare ratio, and a large decline in the rate of major mechanical failures but improvement when looking at all failures. In addition, mechanic pay hours increased slightly to 38.5 percent of car service hours, while maintenance employee scheduled absences increased somewhat and unscheduled absences decreased.
- Safety results showed a relatively small overall increase in the preventable accident rate, and casualty/liability costs per service hour and mile increasing by 63 percent and 47 percent overall, respectively. Meanwhile, the results for lost time due to industrial accidents were essentially steady.
- Paratransit – The following is a brief summary of the paratransit functional trend highlights between FY2016 and FY2018:
  - Service Planning results showed an 18 percent net increase in the cost per passenger mile, decreases to 78 percent and 84 percent of vehicle miles and hours in service respectively, and farebox recovery at 5.8 percent at the beginning and end of the period.
  - Operations results showed a consistent 75 percent of operating costs incurred from vehicle operations, and the complaint rate increasing slightly overall. Schedule adherence declined somewhat to about 86 percent, and missed trips also increased but remained very low in absolute terms. At the same time, there were no ADA trip denials, and the trip cancellation and passenger no-show rates did not change significantly.

- Maintenance results showed a steady 9.2 percent of operating costs incurred from maintenance activities (vehicle and non-vehicle), vehicle maintenance costs per mile increasing by 8.3 percent, the vehicle spare ratio reduced from 20 percent to 12.6 percent, and a noticeable decline in the rate of major mechanical failures early in the period but a smaller net period decline when looking at all failures.
- Safety results showed a 32 percent overall improvement in the FTA reportable accident rate.

## Recommendations

1. CONTINUE EFFORTS TOWARD OBTAINING ACCURATE RESULTS FROM SFMTA'S AUTOMATIC PASSENGER COUNTERS.

*[Reference Sections: II. Review of TDA Data Collection and Reporting Methods; V. Status of Prior Audit Recommendations]*

In the prior audit period, it was found that reported declines in motor coach and trolley coach ridership appeared to reflect measurement errors with the older-generation automatic passenger counters (APCs) still in use. SFMTA reported it was working to ensure that ridership data is accurate, and that both legacy and future APC systems are properly operating. It is also starting to regularly track other indicators of ridership.

During the current audit period and beyond, efforts have continued toward obtaining accurate results from SFMTA's automatic passenger counters. SFMTA reported being in the process of moving from its original autonomous APC data collection system to an APC system developed by Conduent, Inc., and is working on a suite of analytical tools to monitor the APC system data and identify glitches

and speed up remedies. Further, SFMTA is nearing completion of a major APC validation effort that compares APC counts with manual counts.

SFMTA should continue its activities related to validating its legacy APCs and improving business processes around the APCs to ensure that ridership data is accurate. Further, as new vehicles with the latest generation technology APCs are phased in, SFMTA should ensure the future APC systems are properly validated, maintained, and integrated with other in-vehicle systems.



## Table of Contents

	<u>Page No.</u>
Executive Summary .....	i
Performance Audit and Report Organization .....	i
Results and Conclusions .....	ii
Recommendations .....	xiii
I. Introduction .....	1
Performance Audit and Report Organization .....	2
II. Review of TDA Data Collection and Reporting Methods .....	7
Compliance with Requirements .....	7
Consistency of the Reported Statistics .....	8
III. TDA Performance Indicators and Trends .....	19
Motor Coach Performance Trends .....	20
Motor Coach Component Costs .....	28
Trolley Coach Performance Trends .....	32
Trolley Coach Component Costs .....	40
Light Rail Performance Trends .....	44
Light Rail Component Costs .....	52
Cable Car Performance Trends .....	56
Cable Car Component Costs .....	64
Paratransit Performance Trends .....	68
Paratransit Component Costs .....	75
IV. Compliance with PUC Requirements .....	79
V. Status of Prior Audit Recommendations .....	83
VI. Functional Performance Indicator Trends .....	87
Systemwide .....	88
Motor Coach .....	91
Trolley Coach .....	96
Light Rail .....	101
Cable Car .....	106

## Table of Contents, *continued*

	<u>Page No.</u>
Paratransit .....	111
VII. Conclusions and Recommendations.....	116
Appendix A: Input Statistics for Functional Performance Measures .....	A-1
Functional Performance Inputs - Systemwide (All Modes) .....	A-2
Functional Performance Inputs – Motor Coach.....	A-3
Functional Performance Inputs – Trolley Coach .....	A-4
Functional Performance Inputs – Light Rail/Historic Trolley .....	A-5
Functional Performance Inputs – Cable Car .....	A-6
Functional Performance Inputs – Paratransit .....	A-7

## List of Exhibits

	<u>Page No.</u>
Exhibit 1: System Overview .....	3
Exhibit 2: Audit Period Organization Chart (FY2017/FY2018) .....	6
Exhibit 3.1: Compliance with TDA Data Collection and Reporting Requirements.....	10
Exhibit 3.2: TDA Statistics – Motor Coach.....	14
Exhibit 3.3: TDA Statistics – Trolley Coach.....	15
Exhibit 3.4: TDA Statistics – Light Rail.....	16
Exhibit 3.5: TDA Statistics – Cable Car.....	17
Exhibit 3.6: TDA Statistics – Paratransit.....	18
Exhibit 4: TDA Indicator Performance – Motor Coach .....	23
Exhibit 4.1: Operating Cost per Vehicle Service Hour – Motor Coach .....	24
Exhibit 4.2: Passengers per Hour and per Mile – Motor Coach .....	25
Exhibit 4.3: Operating Cost per Passenger – Motor Coach.....	26
Exhibit 4.4: Vehicle Service Hours per FTE – Motor Coach .....	27
Exhibit 4.5: Component Cost Trends – Motor Coach .....	30
Exhibit 4.6: Distribution of Component Costs – Motor Coach .....	31
Exhibit 5: TDA Indicator Performance – Trolley Coach.....	35
Exhibit 5.1: Operating Cost per Vehicle Service Hour – Trolley Coach.....	36
Exhibit 5.2: Passengers per Hour and per Mile – Trolley Coach .....	37
Exhibit 5.3: Operating Cost per Passenger – Trolley Coach .....	38
Exhibit 5.4: Vehicle Service Hours per FTE – Trolley Coach .....	39
Exhibit 5.5: Component Cost Trends – Trolley Coach.....	42
Exhibit 5.6: Distribution of Component Costs – Trolley Coach .....	43
Exhibit 6: TDA Indicator Performance – Light Rail .....	47
Exhibit 6.1: Operating Cost per Car Service Hour – Light Rail.....	48
Exhibit 6.2: Passengers per Hour and per Mile – Light Rail.....	49
Exhibit 6.3: Operating Cost per Passenger – Light Rail.....	50
Exhibit 6.4: Car Service Hours per FTE – Light Rail.....	51
Exhibit 6.5: Component Cost Trends – Light Rail .....	54
Exhibit 6.6: Distribution of Component Costs – Light Rail .....	55

## **List of Exhibits, *continued***

Page No.

Exhibit 7: TDA Indicator Performance – Cable Car .....	59
Exhibit 7.1: Operating Cost per Car Service Hour – Cable Car .....	60
Exhibit 7.2: Passengers per Hour and per Mile – Cable Car .....	61
Exhibit 7.3: Operating Cost per Passenger – Cable Car .....	62
Exhibit 7.4: Car Service Hours per FTE – Cable Car .....	63
Exhibit 7.5: Component Cost Trends – Cable Car .....	66
Exhibit 7.6: Distribution of Component Costs – Cable Car .....	67
Exhibit 8: TDA Indicator Performance – Paratransit .....	71
Exhibit 8.1: Operating Cost per Vehicle Service Hour – Paratransit .....	72
Exhibit 8.2: TDA Indicator Performance – Paratransit .....	73
Exhibit 8.3: Operating Cost per Passenger – Paratransit .....	74
Exhibit 8.4: Component Costs Trends – Paratransit .....	77
Exhibit 8.5: Distribution of Component Costs – Paratransit .....	78
Exhibit 9: Compliance with State PUC Requirements .....	80
Exhibit 10: Status of Prior Audit Recommendations .....	85
Exhibit 11: Functional Performance Trends – Systemwide (All Modes) .....	90
Exhibit 12: Functional Performance Trends – Motor Coach .....	94
Exhibit 13: Functional Performance Trends – Trolley Coach .....	99
Exhibit 14: Functional Performance Trends – Light Rail .....	104
Exhibit 15: Functional Performance Trends – Cable Car .....	109
Exhibit 16: Functional Performance Trends – Paratransit .....	114

## I. INTRODUCTION

Public Utilities Code (PUC) Section 99246 requires that a performance audit be conducted every three years of each public transit operator in California. The audit requirement pertains to recipients of Transportation Development Act (TDA) funds, and is intended to assure that the funds are being used efficiently. The substance and process of the performance audit is defined by the Regional Transportation Planning Agency (RTPA).

In the San Francisco Bay Area, the Metropolitan Transportation Commission (MTC) has been designated the RTPA and has this responsibility. By statute, the audit must be conducted in accordance with the U.S. Comptroller General's "Standards for Audit of Governmental Organizations, Programs, Activities, and Functions" (the "yellow book"). The performance audit is a systematic review to determine the extent to which a transit operator has complied with pertinent laws and regulations, and conducted operations in an efficient and economical manner. Relative to system compliance testing, all findings are reported regardless of materiality.

This report has been prepared as part of the performance audit of the San Francisco Municipal Transportation Agency (SFMTA). SFMTA is part of the government of the City and County of San Francisco. SFMTA operates five different transit modes: motor coach, trolley coach, light rail/historic trolley, cable car, and paratransit. All of these modes are included in this performance audit. The audit period is Fiscal Years 2016 through 2018 (from July 1, 2015 through June 30, 2018).

An overview of SFMTA is provided in Exhibit 1. This is followed by an agency organization chart in Exhibit 2, which reflects the basic executive and division level

structure in effect through the audit period (and beyond). However, it should be noted that SFMTA's organization chart is a live document with departmental and functional assignments within the divisions that change on a frequent basis.

### **Performance Audit and Report Organization**

This performance audit of SFMTA was conducted for MTC in accordance with its established procedures for performance audits. The audit consisted of two discrete steps:

1. Compliance Audit – Activities in this phase included:
  - An overview of data collection and reporting procedures for the five TDA performance indicators;
  - Analysis of the TDA indicators; and
  - A review of compliance with selected state Public Utilities Code (PUC) requirements.
  
2. Functional Review – Activities in this phase included:
  - A review of actions to implement the recommendations from the prior performance audit;
  - Calculation and evaluation of functional performance indicator trends; and
  - Findings, conclusions, and the formulation of recommendations.

This report presents the findings from both phases. Comments received from SFMTA and MTC staff have been incorporated into this final report.

## Exhibit 1: System Overview

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<b>Location</b>	Headquarters: 1 South Van Ness Avenue, 7th Floor, San Francisco, CA 94103
<b>Establishment</b>	In 1999, San Francisco voters approved Proposition E, which amended the City Charter to merge the Municipal Railway (Muni) with the city's Department of Parking and Traffic (DPT). Integration of the two organizations into the San Francisco Municipal Transportation Agency (SFMTA) took place in 2002, creating a multimodal transportation agency to operate transit service, manage city streets, and advance the city's Transit First Policy. SFMTA has continued to evolve by merging with the Taxi Commission in March 2009.
<b>Board</b>	SFMTA is governed by a seven-member Board of Directors, four of whom must be regular riders of public transit. SFMTA's Board is appointed by the mayor and confirmed by the County Board of Supervisors. The Board has the authority to appoint the Executive Director, approve the budget, and set agency policy.
<b>Facilities</b>	SFMTA owns and leases a wide variety of facilities and infrastructure that enables the operation, maintenance, planning, engineering, enforcement, and administration of the complex transportation system in San Francisco. The majority of the 29 facilities are dedicated to the maintenance, fueling, storage, and staging of the transit and traffic enforcement vehicles. Separate operational facilities are maintained for light rail, motor coach, trolley coach and cable car services. Support and administrative functions are housed in a number of locations within the system. Also under SFMTA control are 19 public parking garages and 19 metered parking lots.
<b>Service Data</b>	<p>Muni transit service is operated 24 hours a day, seven days a week, and in FY2019, SFMTA operates 83 lines. SFMTA directly operates four modes of service: motor coach, trolley coach, light rail (Muni Metro and historic streetcars) and cable cars. All residential neighborhoods in San Francisco are within a quarter of a mile of a Muni bus or rail line stop.</p> <p>The adult daily cash fare and Paratransit Van Service fare is currently \$2.50. Transfers are free and can be used for two hours in any direction. Cable car fares are \$7.00 per trip. Multi-ride time-based media, such as daily, weekly, and monthly passes, are available as well. SFMTA also has ongoing transfer arrangements with connecting transit systems.</p> <p>In FY2019, SFMTA's motor coach revenue fleet contains 639 vehicles, which include a mix of small, standard and articulated coaches. The trolley coach fleet consists of 306 vehicles. The rail fleet consists of 185 modern light rail vehicles as well as 76 operational historic streetcars. The cable car fleet includes a total of 40 cars. In recent years, SFMTA has ordered and begun accepting delivery of new vehicles, some to replace older</p>

vehicles being taken out of service, and others intended to increase the size of the fleet.

SFMTA operates four programs that provide paratransit services to seniors and persons with disabilities who are unable to independently ride the Muni fixed route system. In FY2019 SFMTA has worked with various contractors to operate twenty-six 22-foot vans, three 25-foot vans, eighty-eight 22 ½ - foot vans, and twenty-seven wheelchair accessible minivans. Approximately 400,000 trips have been completed for more than 8,900 active riders. In addition to these contracted services, all taxi companies in San Francisco are required to participate in the SF Paratransit program by City ordinance. A user-side subsidy is provided to Paratransit clients, who are issued a debit card to pay for their paratransit taxi trips.

### **Recent Changes**

In 2018, the SFMTA developed its most recent five-year Strategic Plan. In effect during this audit period, the Strategic Plan identifies the agency's core values, vision, mission and strategic goals for the near future. Furthermore, the four strategic goals that were adopted in the plan are supported by a set of objectives, key indicators, and targets.

In 2014, the SFMTA concluded an extensive evaluation of its system under the Transit Effectiveness Project (TEP). The TEP was an in-depth planning process supported by data, engagement with the community at various levels, and critical lessons learned through the implementation of pilot projects. Informed by this study, SFMTA developed a program of projects called Muni Forward – route changes, service improvements, and comfort and safety enhancements. The Muni Forward program is ongoing.

Since FY2013, SFMTA has run a program to provide free Muni service for low income youth (ages 5-17). In January 2015, the SFMTA Board voted to expand the Free Muni program, which now covers low- and moderate-income youth (age 22 and under), seniors and people with disabilities.

In January 2015, the Board of Directors approved a three percent increase in transit service in FY2015 and a seven percent increase in FY2016. Service levels have remained relatively constant since that time.

### **Planned Changes**

The Central Subway Project, currently under construction, will continue the T-Third light rail service from 4th and King Street to Chinatown.

The Van Ness Improvement Project and Geary Rapid Project, currently under construction, will provide bus rapid transit (BRT) service on Van Ness Avenue and Geary Boulevard.

Through the Muni Forward program, SFMTA has identified approximately 40 additional miles of transit priority streets in San Francisco. Many transit priority projects have been completed, and more are underway.



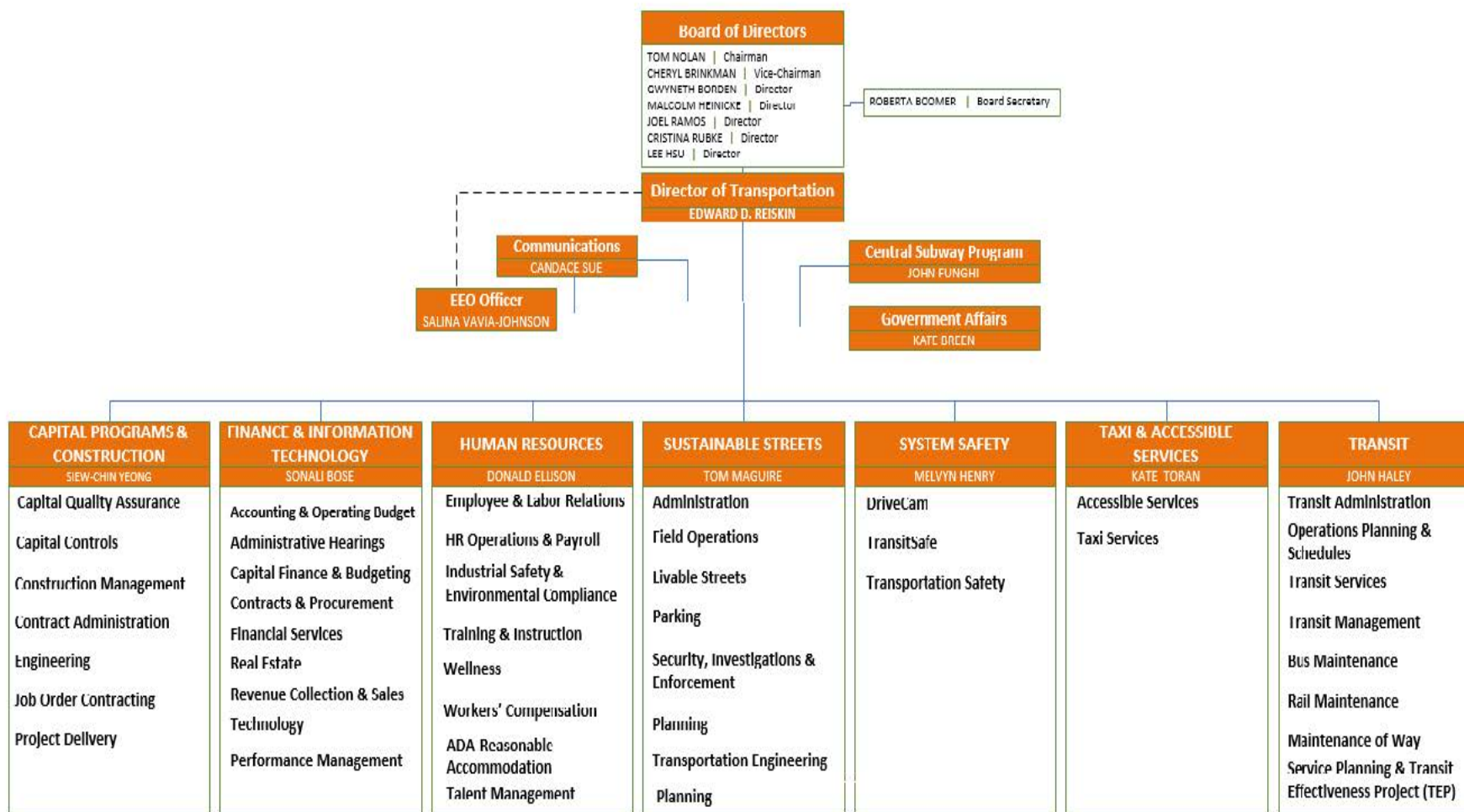
SFMTA has started to replace its entire bus and light rail fleet – the bus fleet is anticipated to be completely turned over by 2020 and the first light rail vehicles began to arrive in 2017.

**Staff**

SFMTA's employees are divided among a number of divisions. FY2019-20 budgeted staffing (FTEs, including transit-specific and other positions) by division is summarized below:

Board of Directors	4.0
Capital Programs and Construction	209.2
Communications	41.2
Director of Transportation	1.8
Finance & Information Technology	456.1
Government Affairs	5.0
Human Resources	166.6
System Safety	20.0
Sustainable Streets	686.5
Taxis & Accessible Services	29.7
Transit	4,352.6
<u>Total</u>	<u>5,972.6</u>

## Exhibit 2: Audit Period Organization Chart (FY2017/FY2018)



## II. REVIEW OF TDA DATA COLLECTION AND REPORTING METHODS

This section focuses on the five performance indicators required by TDA law. These indicators have been defined by the state PUC to evaluate the transit operator's efficiency, effectiveness and economy. The purpose of this review is to determine if SFMTA is compliance with the data collection and reporting requirements necessary to calculate the TDA performance indicators. The review is limited to the data items needed to calculate the indicators:

- Operating costs
- Vehicle service hours
- Vehicle service miles
- Unlinked passengers
- Employees (full-time equivalents)

The TDA indicator analysis is based on these operating and financial statistics in the National Transit Database (NTD) reports submitted annually to the Federal Transit Administration (FTA). The information reported by SFMTA covering the audit period has been reviewed. SFMTA's NTD reports include its directly operated fixed-route and fixed-guideway services as well as its brokered and contracted paratransit service. However, consistent with FTA reporting requirements, SFMTA does not submit employee hour information for purchased transportation service to the NTD.

### Compliance with Requirements

To support this review, SFMTA also provided information to confirm and/or update its data collection and reporting procedures, using the descriptions in the prior performance audit as a reference. There were no changes except for unlinked passengers,

where the older unreliable automatic passenger counter (APC) system is in the process of being replaced for the bus services, and SFMTA now uses automatically generated data to report all SF Access and Intercounty trips while using a limited manual validation for all electronically reported Group Van trips for paratransit. The staff indicated that the definitions and procedures used to derive the TDA indicator statistics generally are consistent with those used for the NTD reporting system.

Based on the information provided, as shown in Exhibit 3.1, SFMTA is in compliance with the data collection and reporting requirements for all five TDA statistics.

#### Consistency of the Reported Statistics

The resulting TDA statistics for SFMTA's services are shown by mode in Exhibits 3.2 through 3.6. Included are statistics covering each fiscal year of the three-year audit period, plus the immediately preceding three fiscal years, resulting in a six-year trend. The statistics collected over the period appear to be consistent with the TDA definitions. Further, they indicate general consistency in terms of the direction and magnitude of the year-to-year changes across the statistics. For example, increases or decreases in annual operating costs are for the most part relatively proportional to increases or decreases in annual vehicle service hours and miles.

However, it was observed that in the earlier years, there were reported declines in motor coach and especially trolley coach ridership (shown in Exhibits 3.2 and 3.3) that SFMTA suggested did not reflect actual ridership trends but resulted from measurement errors with the aging automatic passenger counters (APCs). This may also have had an impact in the later years, specifically where reported trolley coach passenger levels declined sharply toward the end of the current audit period.

Further, a change in data methodology to more accurately capture missed service through enhanced use of the Central Control Logs and the Automatic Train Control System (ACTS) resulted in significantly reduced car service hours and miles being reported for light rail starting in FY2014 and cable car in FY2015, as shown in Exhibits 3.4 and 3.5.

### Exhibit 3.1: Compliance with TDA Data Collection and Reporting Requirements

TDA Statistic	TDA Definition	Compliance Finding	Verification Information
Operating Cost	<p>“Operating cost” means all costs in the operating expense object classes exclusive of the costs in the depreciation and amortization expense object class of the uniform system of accounts and records adopted by the Controller pursuant to Section 99243, and exclusive of all subsidies for commuter rail services operated under the jurisdiction of the Interstate Commerce Commission and of all direct costs for providing charter services, and exclusive of all vehicle lease costs.</p>	In Compliance	<ul style="list-style-type: none"> <li>• For all modes: operating costs are extracted from the citywide FAMIS system through EIS (Executive Information System). A file command reporting mechanism was used through FY2017, and People Soft system beginning in FY2018.</li> <li>• The data is downloaded to spreadsheets by function and mode. Undistributed costs for each function are allocated to specific modes using an agreed upon allocation methodology.</li> </ul>
Vehicle Service Hours	<p>“Vehicle service hours” means the total number of hours that each transit vehicle is in revenue service, including layover time.</p>	In Compliance	<ul style="list-style-type: none"> <li>• Bus and Rail: Trapeze scheduling software provides block summaries of scheduled hours and miles for each mode. SFMTA uses data from Trapeze, Central Control logs, and Automatic Train Control System logs to calculate total missed service. Missed service is subtracted from scheduled hours and miles to provide actual hours and miles. Cable Car mileage is based on GPS data, which is downloaded daily and entered in SHOPS software system.</li> <li>• Paratransit: Mobile Data Computers (MDCs) and GPS linked with geographical scheduling software (Trapeze PASS) record and report the mileage and hours data. This is supplemented with direct entry for vehicles without or with faulty devices. For Demand Taxi, Debit Card Central System (DDCS) and geographical software is used to track, report, process and validate all taxi trips and related transactions to provide an array of data including vehicle service hours.</li> </ul>

TDA Statistic	TDA Definition	Compliance Finding	Verification Information
Vehicle Service Miles	“Vehicle service miles” means the total number of miles that each transit vehicle is in revenue service.	In Compliance	<ul style="list-style-type: none"> <li>• Bus and Rail: Trapeze scheduling software provides block summaries of scheduled hours and miles for each mode. SFMTA uses data from Trapeze, Central Control logs, and Automatic Train Control System logs to calculate total missed service. Missed service is subtracted from scheduled hours and miles to provide actual hours and miles. Cable Car mileage is based on GPS data, which is downloaded daily and entered in SHOPS software system.</li> <li>• Paratransit: Mobile Data Computers (MDCs) and GPS linked with geographical scheduling software (Trapeze PASS) record and report the mileage and hours data. This is supplemented with direct entry for vehicles without or with faulty devices. For Demand Taxi, Debit Card Central System (DDCS) and geographical software is used to track, report, process and validate all taxi trips and related transactions to provide an array of data including vehicle service miles.</li> </ul>
Unlinked Passengers	“Unlinked passengers” means the number of boarding passengers, whether revenue producing or not, carried by the public transportation system.	In Compliance with Follow-up	<ul style="list-style-type: none"> <li>• Bus: SFMTA uses an Automatic Passenger Counter (APC) system to measure unlinked passengers on its buses. SFMTA deploys APC-equipped vehicles across all bus routes according to a sampling plan. The APC reporting system uses the data gathered from the APC-equipped buses to calculate total unlinked passengers. Efforts are continuing toward obtaining accurate results from SFMTA’s automatic passenger counters. SFMTA is the process of moving from its original autonomous APC data collection system (which uses older generation technology and appears to be nearing the end of its useful life) to a</li> </ul>

TDA Statistic	TDA Definition	Compliance Finding	Verification Information
			<p>new APC system developed by Conduent, Inc., and is working to identify glitches and speed up remedies. Further, SFMTA has undertaken a major APC validation effort that compares APC counts with manual counts.</p> <ul style="list-style-type: none"> <li>• Rail: A two-pronged approach that is approved by an independent consultant and accepted by the Federal Transit Administration is used for estimating ridership: <ul style="list-style-type: none"> <li>- Baseline - First, a baseline is developed approximately every seven years. To develop a baseline, Traffic Checkers ride the vehicles and count passengers getting on and off at each stop to determine the boardings for the entire line and a maximum load point. The baseline also provides a ratio of boardings to passenger miles.</li> <li>- Yearly Monitoring - The conversion factors for boardings and passenger miles are set at the completion of the baseline. An update of each line is conducted every year to determine changes in ridership at the maximum load point. The ridership data generates changes in the estimated boardings and passenger miles.</li> </ul> </li> <li>• Paratransit: The contractor submits reports to SFMTA with its monthly invoices, which contain ridership figures validated by the Broker staff to ensure that SFMTA does not pay for trips not actually provided. The contractor sums up the monthly trip counts that have gone through the validation process. SFMTA uses automatically generated data to report all SF Access and Intercounty trips while using a limited manual validation for all electronically reported Group Van trips.</li> </ul>



TDA Statistic	TDA Definition	Compliance Finding	Verification Information
Employee Full-Time Equivalents	2,000 person-hours of work in one year constitute one employee.	In Compliance	<ul style="list-style-type: none"> <li>• For all modes: statistical data for labor hours is extracted from the citywide payroll system (Labor Distribution System - a subsystem of FAMIS) using a file command reporting mechanism.</li> <li>• The total hours from the report are entered into spreadsheets by function and mode. Undistributed hours for each function are allocated to specific modes.</li> <li>• Resulting labor hours are divided by 2000 to arrive at FTEs for TDA reporting.</li> </ul>

### Exhibit 3.2: TDA Statistics – Motor Coach

	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018
Operating Cost (Actual \$)	\$257,977,594	\$282,652,719	\$290,970,598	\$311,440,005	\$329,281,264	\$341,543,252
<i>Annual Change</i>	- -	9.6%	2.9%	7.0%	5.7%	3.7%
Vehicle Service Hours	1,461,447	1,464,828	1,491,118	1,669,527	1,910,010	1,868,233
<i>Annual Change</i>	- -	0.2%	1.8%	12.0%	14.4%	-2.2%
Vehicle Service Miles	12,043,494	11,870,110	11,806,194	13,497,051	14,922,469	14,626,744
<i>Annual Change</i>	- -	-1.4%	-0.5%	14.3%	10.6%	-2.0%
Unlinked Passengers	97,180,861	98,365,557	95,005,347	101,846,949	107,795,832	111,809,076
<i>Annual Change</i>	- -	1.2%	-3.4%	7.2%	5.8%	3.7%
Employee Full-Time Equivalents	1,397.5	1,506.2	1,682.5	1,818.2	1,912.2	1,987.7
<i>Annual Change</i>	- -	7.8%	11.7%	8.1%	5.2%	4.0%

Sources: FY2013 through FY2015 - Prior Performance Audit Report (FY2015 preliminary NTD results confirmed/adjusted per NTD Database)  
 FY2016 through FY2018 - NTD Reports (FY2018 NTD is preliminary)

### Exhibit 3.3: TDA Statistics – Trolley Coach

	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018
Operating Cost (Actual \$)	\$141,409,025	\$152,561,728	\$166,818,618	\$175,178,172	\$165,409,220	\$175,643,075
<i>Annual Change</i>	- -	7.9%	9.3%	5.0%	-5.6%	6.2%
Vehicle Service Hours	947,295	950,442	939,313	979,125	872,395	855,063
<i>Annual Change</i>	- -	0.3%	-1.2%	4.2%	-10.9%	-2.0%
Vehicle Service Miles	6,044,020	6,014,207	5,690,212	6,204,992	5,481,374	5,250,293
<i>Annual Change</i>	- -	-0.5%	-5.4%	9.0%	-11.7%	-4.2%
Unlinked Passengers	65,247,637	65,328,431	60,553,936	65,120,886	53,301,250	49,199,803
<i>Annual Change</i>	- -	0.1%	-7.3%	7.5%	-18.2%	-7.7%
Employee Full-Time Equivalent	878.3	880.3	986.9	1,025.5	1,016.1	1,032.3
<i>Annual Change</i>	- -	0.2%	12.1%	3.9%	-0.9%	1.6%

Sources: FY2013 through FY2015 - Prior Performance Audit Report (FY2015 preliminary NTD results confirmed/adjusted per NTD Database)  
FY2016 through FY2018 - NTD Reports (FY2018 NTD is preliminary)

### Exhibit 3.4: TDA Statistics – Light Rail

	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018
Operating Cost (Actual \$)	\$198,475,301	\$207,882,197	\$204,804,984	\$235,597,442	\$237,569,785	\$252,428,452
<i>Annual Change</i>	- -	4.7%	-1.5%	15.0%	0.8%	6.3%
Car Service Hours	655,262	532,901	605,066	633,736	696,396	652,845
<i>Annual Change</i>	- -	-18.7%	13.5%	4.7%	9.9%	-6.3%
Car Service Miles	5,859,656	5,264,532	5,271,803	5,691,158	6,296,563	5,782,528
<i>Annual Change</i>	- -	-10.2%	0.1%	8.0%	10.6%	-8.2%
Unlinked Passengers	53,749,159	56,951,602	56,932,671	59,580,128	58,465,020	57,309,366
<i>Annual Change</i>	- -	6.0%	0.0%	4.7%	-1.9%	-2.0%
Employee Full-Time Equivalent	936.1	1,026.2	1,080.5	1,093.6	1,175.8	1,224.5
<i>Annual Change</i>	- -	9.6%	5.3%	1.2%	7.5%	4.1%

Sources: FY2013 through FY2015 - Prior Performance Audit Report (FY2015 preliminary NTD results confirmed/adjusted per NTD Database)  
FY2016 through FY2018 - NTD Reports (FY2018 NTD is preliminary)

### Exhibit 3.5: TDA Statistics – Cable Car

	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018
Operating Cost (Actual \$)	\$51,868,243	\$52,143,335	\$59,761,428	\$62,057,044	\$66,854,982	\$68,022,089
<i>Annual Change</i>	- -	0.5%	14.6%	3.8%	7.7%	1.7%
Car Service Hours	141,863	143,383	137,085	139,238	147,083	145,396
<i>Annual Change</i>	- -	1.1%	-4.4%	1.6%	5.6%	-1.1%
Car Service Miles	299,841	291,853	278,250	258,452	264,247	298,274
<i>Annual Change</i>	- -	-2.7%	-4.7%	-7.1%	2.2%	12.9%
Unlinked Passengers	6,813,349	7,331,777	6,834,184	5,800,222	6,224,072	6,292,346
<i>Annual Change</i>	- -	7.6%	-6.8%	-15.1%	7.3%	1.1%
Employee Full-Time Equivalents	366.3	378.7	427.2	407.1	436.7	429.0
<i>Annual Change</i>	- -	3.4%	12.8%	-4.7%	7.3%	-1.8%

Sources: FY2013 through FY2015 - Prior Performance Audit Report (FY2015 preliminary NTD results confirmed/adjusted per NTD Database)  
FY2016 through FY2018 - NTD Reports (FY2018 NTD is preliminary)

### Exhibit 3.6: TDA Statistics – Paratransit

	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018
Operating Cost (Actual \$)	\$13,181,343	\$14,164,223	\$17,962,926	\$18,772,080	\$20,609,984	\$21,304,500
<i>Annual Change</i>	- -	7.5%	26.8%	4.5%	9.8%	3.4%
Vehicle Service Hours	212,250	254,895	248,901	260,072	259,756	259,338
<i>Annual Change</i>	- -	20.1%	-2.4%	4.5%	-0.1%	-0.2%
Vehicle Service Miles	1,694,622	1,969,621	1,802,314	1,745,564	1,968,208	1,826,069
<i>Annual Change</i>	- -	16.2%	-8.5%	-3.1%	12.8%	-7.2%
Unlinked Passengers	582,565	509,968	487,102	479,290	475,786	445,651
<i>Annual Change</i>	- -	-12.5%	-4.5%	-1.6%	-0.7%	-6.3%

Sources: FY2013 through FY2015 - NTD Reports/Database (DR only)  
 FY2016 through FY2018 - NTD Reports (FY2018 NTD is preliminary)

### III. TDA PERFORMANCE INDICATORS AND TRENDS

The performance trends for the five SFMTA service modes (motor coach, trolley coach, light rail/historic trolley, cable car, and paratransit) are presented in this section. Performance is discussed for each of the five TDA-mandated performance indicators:

- operating cost per vehicle service hour
- passengers per vehicle service hour
- passengers per vehicle service mile
- operating cost per passenger
- vehicle service hours per full-time equivalent employee (FTE)

The performance results in these indicators were generally developed from the information in the NTD reports filed with the FTA for the three years of the audit period by SFMTA. The NTD reports were the primary source of all operating and financial statistics except for paratransit contractor FTEs. Contractor employee FTE data is unavailable for this audit due to the nature of these contracted services.

In addition to presenting performance for the three years of the audit period (FY2016 through FY2018), this analysis features two enhancements:

- Six-Year Time Period – While the performance audit focuses on the three fiscal years of the audit period, six-year trend lines have been constructed for SFMTA’s service to provide a longer perspective on performance and to clearly present the direction and magnitude of the performance trends. In this analysis, the FY2016 to FY2018 trend lines have been combined with those from the prior audit period (FY2013 through FY2015) to define a six-year period of performance.
- Normalized Cost Indicators for Inflation – Two financial performance indicators (cost per hour and cost per passenger) are presented in both constant and current dollars to illustrate the impact of inflation in the Bay

Area. The inflation adjustment relies on the All Urban Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W) for the San Francisco Metropolitan Area. The average CPI-W percent change for each fiscal year has been calculated based on the bi-monthly results reported on the U.S. Department of Labor – Bureau of Labor Statistics website. The CPI-W is used since labor is the largest component of operating cost in transit. Since labor costs are typically controlled through labor contracts, changes in normalized costs largely reflect those factors that are within the day-to-day control of the transit system.

The following discussion is organized to present an overview of SFMTA’s performance trends in each of the five TDA performance indicators. The discussion is organized by service mode. The motor coach service is discussed first, followed by trolley coach, light rail/historic trolley, cable car, and then paratransit. For all service modes, the analysis is expanded to include a breakdown of the various component costs that contributed to the total and hourly operating costs during the last six years.

It should be noted that for the rail modes, the operating statistics utilized are car service hours and miles, not train service hours and miles.

### Motor Coach Performance Trends

This section provides an overview of the performance of SFMTA’s motor coach service over the past six years. The trends in the TDA indicators and input statistics are presented in Exhibit 4. The six-year trends are illustrated in Exhibits 4.1 through 4.4.

- Operating Cost per Vehicle Service Hour (Exhibit 4.1)
  - A key indicator of cost efficiency, the cost per hour of motor coach service increased an average of 0.7 percent annually, as service hours increased at a slightly lower rate than operating costs.



- The cost per hour ranged from a high of \$195.14 in FY2015 to a low of \$172.40 in FY2017. There were increases in most years but decreases were posted in FY2016 and FY2017.
- In constant FY2013 dollars, there was actually an average annual decrease in this indicator of 2.1 percent.
- Passengers per Vehicle Service Hour (Exhibit 4.2)
  - A key indicator of passenger productivity, the highest level of passengers per hour was in FY2014 (67.2), and the lowest in FY2017 (56.4).
  - Overall during the review period, there was an average annual decrease of 2.1 percent in this indicator.
- Passengers per Vehicle Service Mile (Exhibit 4.2)
  - The six-year trend in this indicator showed an annual average decrease of 1.1 percent, as service miles increased at a somewhat higher rate than ridership.
  - There were eight or more passengers per mile in the first three years, compared with less than eight in all three of the most recent years.
- Operating Cost per Passenger (Exhibit 4.3)
  - A key measure of cost effectiveness, the motor coach cost per passenger was \$2.65 in the first year of the review period, followed by a general increase to about \$3.05 for the last four years.
  - The overall increase averaged 2.8 percent annually, as total operating costs increased at a higher rate than passengers.
  - With the impact of inflation removed from the cost side (normalization), the result also \$2.65 per passenger in FY2018, for no net change over the period.

- Vehicle Service Hours per Employee (FTE) (Exhibit 4.4)
  - A measure of employee productivity, this indicator decreased an average 2.1 percent per year over the six years.
  - Hours per FTE decreased overall from about 1,045 in FY2013 to 940 in FY2018, with lower levels in certain interim years.
  - Vehicle service hours and FTEs both increased overall during the period, but the increase in hours was less pronounced.

\* \* \* \* \*

The following is a brief summary of the TDA performance trend highlights over the six-year period of FY2013 through FY2018:

- There was an average annual increase in the operating cost per hour of 0.7 percent, which amounted to a 2.1 percent decrease in inflation adjusted dollars.
- The cost per passenger increased on average by 2.8 percent per year, which amounted to steady performance (\$2.65 per passenger) when expressed in constant FY2013 dollars.
- Passenger productivity exhibited a downward trend. Passengers per vehicle service hour and mile declined by 2.1 percent and 1.1 percent per year on average, as service levels increased at a moderately higher rate than passengers.
- Employee productivity decreased an average 2.1 percent per year.

### Exhibit 4: TDA Indicator Performance – Motor Coach

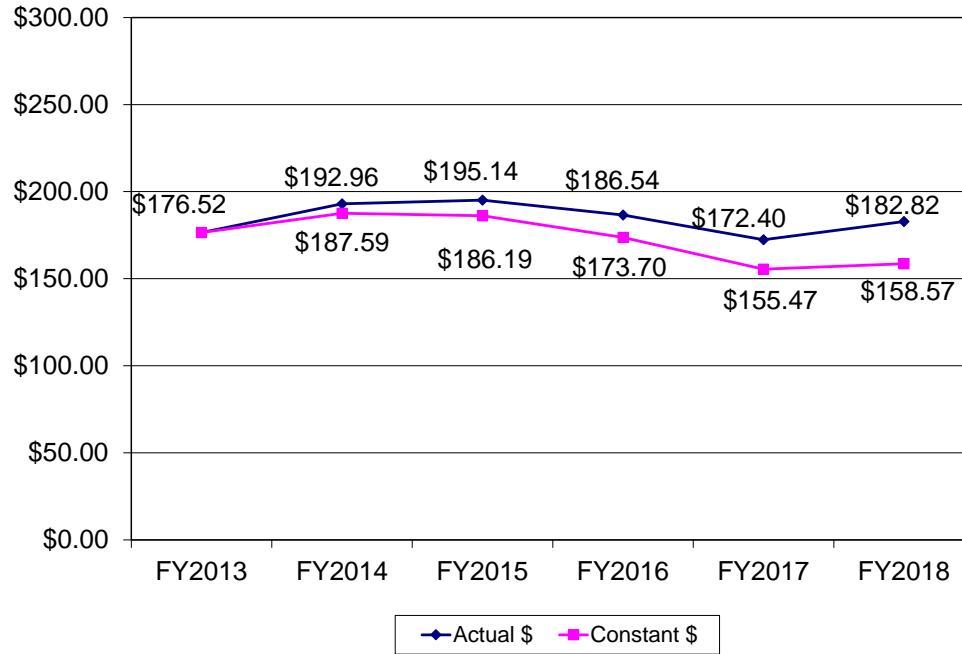
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Av. Ann. Chg.
<b>Performance Indicators</b>							
Op. Cost per Vehicle Svc. Hour (Actual \$)	\$176.52	\$192.96	\$195.14	\$186.54	\$172.40	\$182.82	- -
<i>Annual Change</i>	- -	9.3%	1.1%	-4.4%	-7.6%	6.0%	0.7%
Op. Cost per Vehicle Svc. Hour (Constant \$)	\$176.52	\$187.59	\$186.19	\$173.70	\$155.47	\$158.57	- -
<i>Annual Change</i>	- -	6.3%	-0.7%	-6.7%	-10.5%	2.0%	-2.1%
Passengers per Vehicle Service Hour	66.5	67.2	63.7	61.0	56.4	59.8	- -
<i>Annual Change</i>	- -	1.0%	-5.1%	-4.3%	-7.5%	6.0%	-2.1%
Passengers per Vehicle Service Mile	8.1	8.3	8.0	7.5	7.2	7.6	- -
<i>Annual Change</i>	- -	2.7%	-2.9%	-6.2%	-4.3%	5.8%	-1.1%
Op. Cost per Passenger (Actual \$)	\$2.65	\$2.87	\$3.06	\$3.06	\$3.05	\$3.05	- -
<i>Annual Change</i>	- -	8.2%	6.6%	-0.2%	-0.1%	0.0%	2.8%
Op. Cost per Passenger (Constant \$)	\$2.65	\$2.79	\$2.92	\$2.85	\$2.75	\$2.65	- -
<i>Annual Change</i>	- -	5.2%	4.6%	-2.6%	-3.3%	-3.8%	0.0%
Vehicle Service Hours per FTE	1,045.8	972.6	886.3	918.2	998.9	939.9	- -
<i>Annual Change</i>	- -	-7.0%	-8.9%	3.6%	8.8%	-5.9%	-2.1%
<b>Input Data</b>							
Operating Cost (Actual \$)	\$257,977,594	\$282,652,719	\$290,970,598	\$311,440,005	\$329,281,264	\$341,543,252	- -
<i>Annual Change</i>	- -	9.6%	2.9%	7.0%	5.7%	3.7%	5.8%
Operating Cost (Constant \$)	\$257,977,594	\$274,783,720	\$277,624,622	\$290,004,544	\$296,957,678	\$296,242,476	- -
<i>Annual Change</i>	- -	6.5%	1.0%	4.5%	2.4%	-0.2%	2.8%
Vehicle Service Hours	1,461,447	1,464,828	1,491,118	1,669,527	1,910,010	1,868,233	- -
<i>Annual Change</i>	- -	0.2%	1.8%	12.0%	14.4%	-2.2%	5.0%
Vehicle Service Miles	12,043,494	11,870,110	11,806,194	13,497,051	14,922,469	14,626,744	- -
<i>Annual Change</i>	- -	-1.4%	-0.5%	14.3%	10.6%	-2.0%	4.0%
Unlinked Passengers	97,180,861	98,365,557	95,005,347	101,846,949	107,795,832	111,809,076	- -
<i>Annual Change</i>	- -	1.2%	-3.4%	7.2%	5.8%	3.7%	2.8%
Employee Full-Time Equivalents	1,397.5	1,506.2	1,682.5	1,818.2	1,912.2	1,987.7	- -
<i>Annual Change</i>	- -	7.8%	11.7%	8.1%	5.2%	4.0%	7.3%
Bay Area CPI - Annual Change	- -	2.9%	1.9%	2.5%	3.3%	4.0%	- -
- Cumulative Change	- -	2.9%	4.8%	7.4%	10.9%	15.3%	2.9%

*Sources: FY2013 through FY2015 - Prior Performance Audit Report (FY2015 preliminary NTD results confirmed/adjusted per NTD Database)*

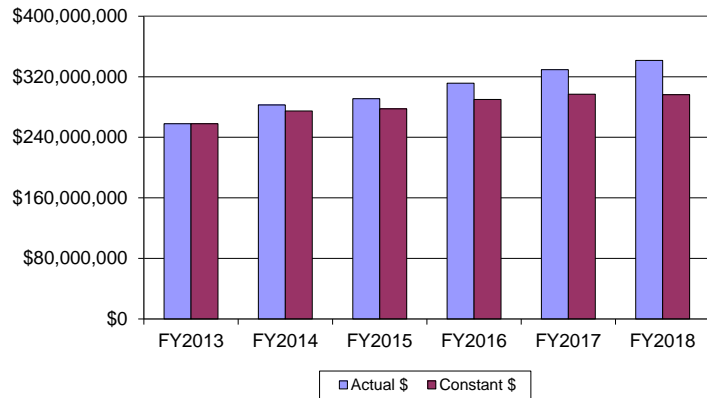
*FY2016 through FY2018 - NTD Reports (FY2018 NTD is preliminary)*

*CPI Data - U.S. Department of Labor, Bureau of Labor Statistics*

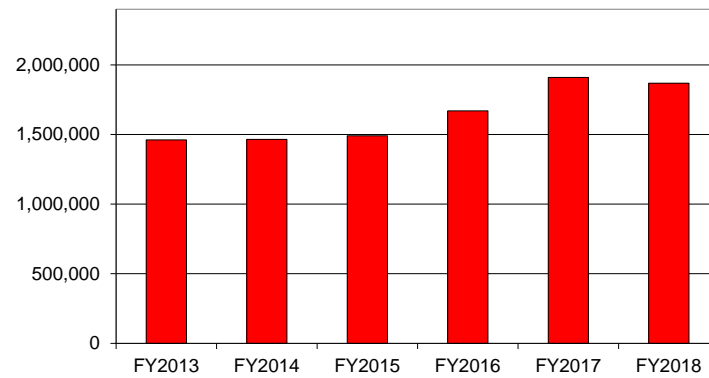
### Exhibit 4.1: Operating Cost per Vehicle Service Hour – Motor Coach



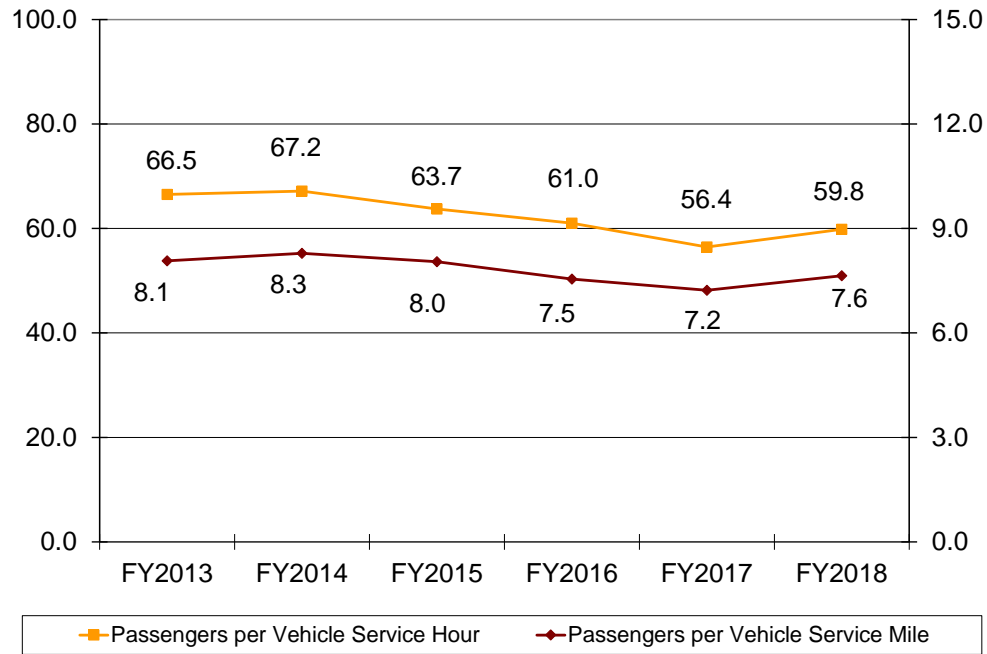
#### Operating Cost



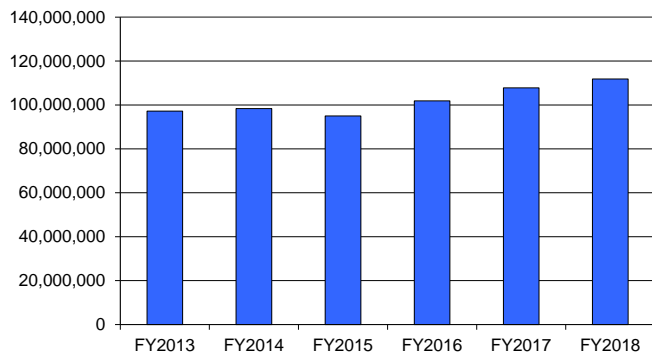
#### Vehicle Service Hours



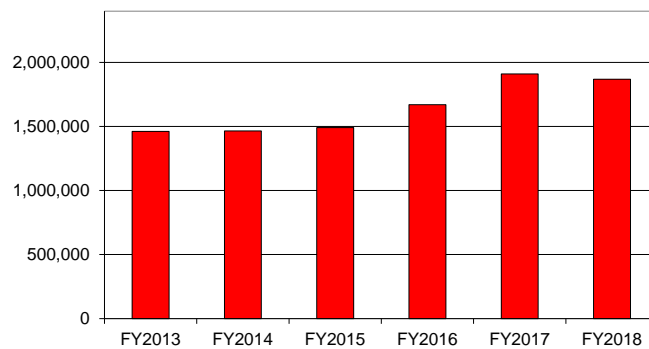
### Exhibit 4.2: Passengers per Hour and per Mile – Motor Coach



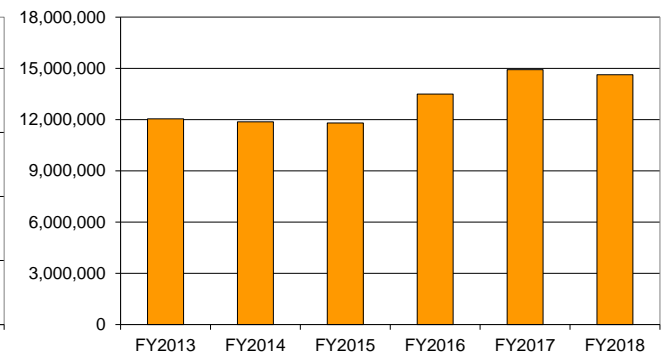
**Unlinked Passengers**



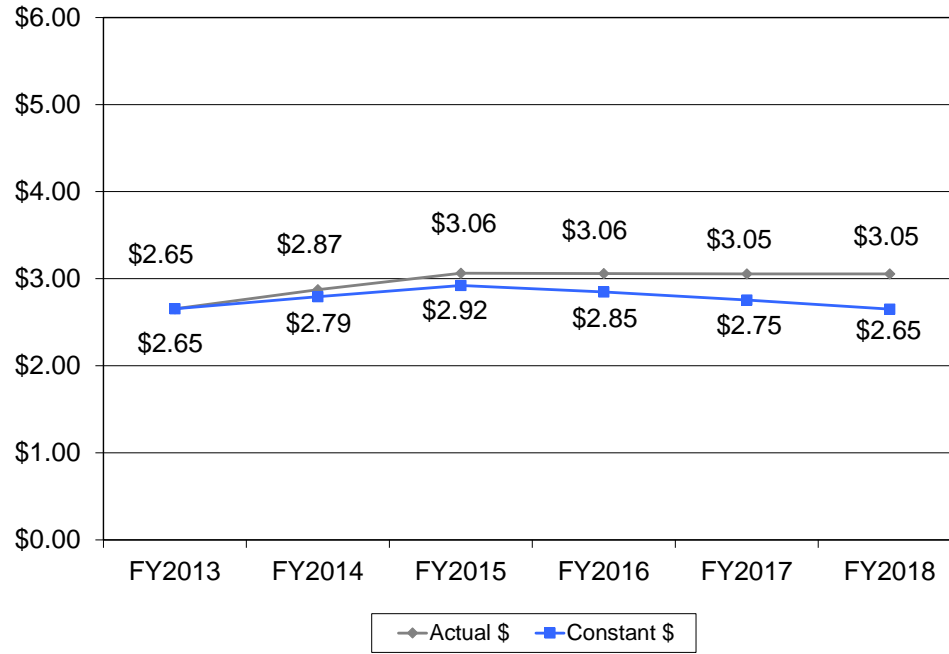
**Vehicle Service Hours**



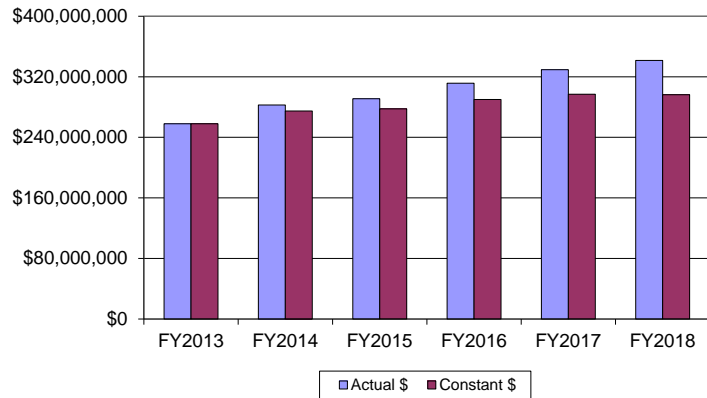
**Vehicle Service Miles**



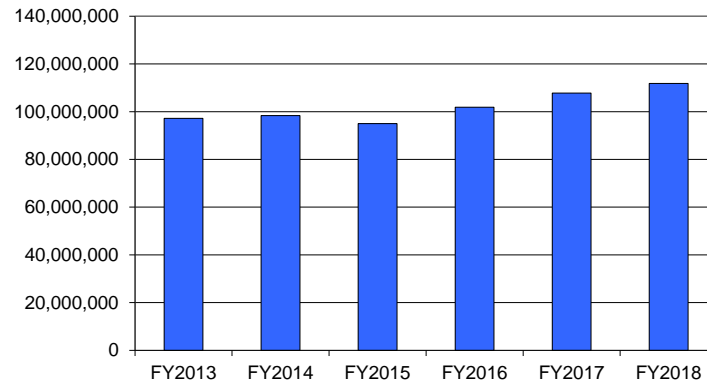
### Exhibit 4.3: Operating Cost per Passenger – Motor Coach



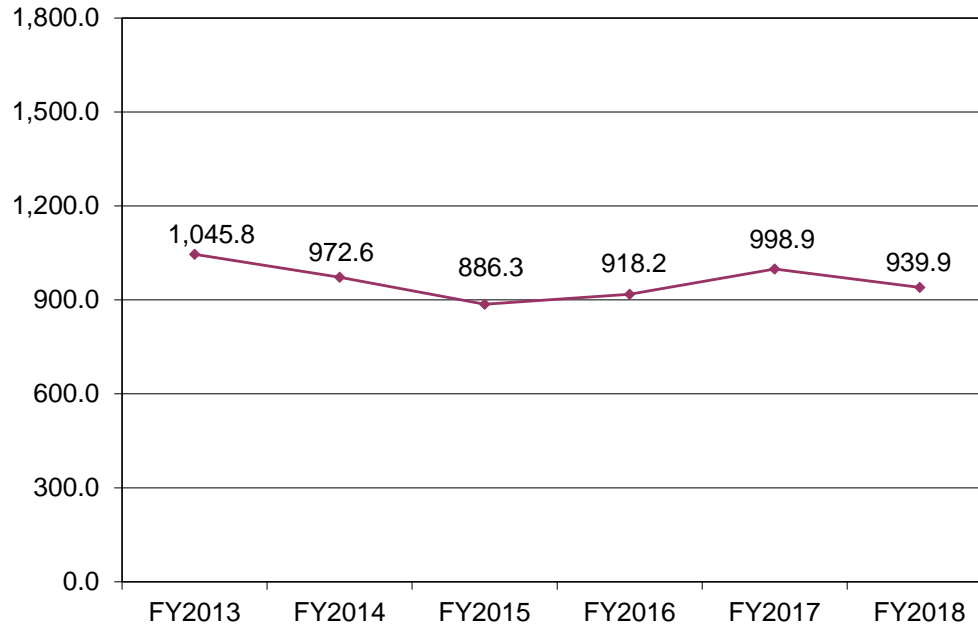
#### Operating Cost



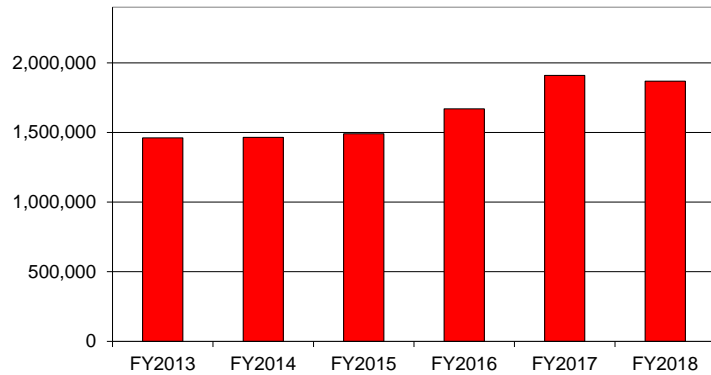
#### Unlinked Passengers



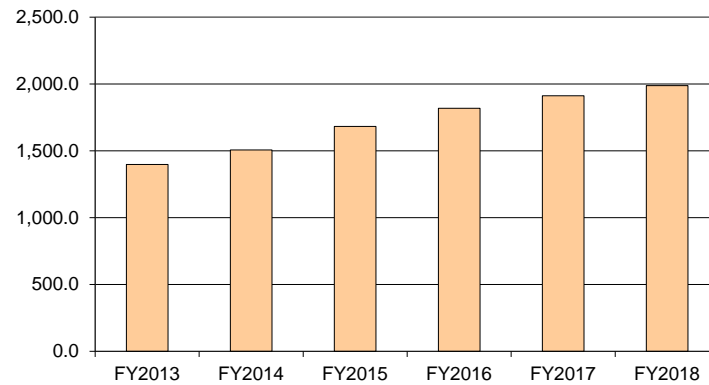
**Exhibit 4.4: Vehicle Service Hours per FTE – Motor Coach**



**Vehicle Service Hours**



**Full-time Equivalent**



## Motor Coach Component Costs

Year-to-year changes in selected operating cost categories over the past six years are presented in Exhibit 4.5. Examining components of operating costs (e.g., labor, fringes, fuel, and casualty/liability) may determine what particular components had the most significant impacts on the operating costs. Exhibit 4.5 also shows the concurrent changes in vehicle service hours and Exhibit 4.6 illustrates the portion of the cost per motor coach service hour that can be attributed to each included cost component.

- Between FY2013 and FY2018, total operating costs increased by 5.8 percent annually.
- The most significant change was an average annual increase of 27.6 percent in the casualty/liability area. In addition, a negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
- Labor costs represented the largest portion of the total costs, increasing overall from about 36 to 40 percent over the period.
- Fringe benefits comprised the second largest portion, in a range of 31 to 35 percent.
- Labor and fringe benefits costs both increased by 7.7 percent on average per year.
- Materials/supplies costs generally decreased over the period from 16 to eight percent of total costs.
- Services costs contributed between 10 and 12 percent, and other cost categories generally contributed less than 10 percent each.

\* \* \* \* \*

The following is a brief summary of the component operating costs trend highlights between FY2013 and FY2018:



- The most significant change was an average annual increase of more than 27 percent in the casualty/liability area. In addition, a negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
- Labor costs represented the largest portion of the total costs, with a share that generally increased from 36 percent to 40 percent over the six years. Fringe benefits comprised the second largest portion, ranging between 31 and 35 percent during the review period. Labor and fringe benefits costs both increased by 7.7 percent on average per year.
- Materials/supplies costs generally decreased over the period from 16 to eight percent of total costs, and other cost categories each generally contributed 13 percent or less.

### Exhibit 4.5: Component Cost Trends – Motor Coach

	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Av. Ann. Chg.
COST CATEGORIES							
Labor (Salaries/Wages)	\$95,097,302	\$101,335,101	\$110,692,080	\$122,803,403	\$133,428,712	\$137,731,743	--
<i>Annual Change</i>	--	6.6%	9.2%	10.9%	8.7%	3.2%	7.7%
Fringe Benefits	\$80,992,710	\$89,752,641	\$96,568,405	\$106,550,819	\$116,051,025	\$117,536,762	--
<i>Annual Change</i>	--	10.8%	7.6%	10.3%	8.9%	1.3%	7.7%
Services	\$33,094,179	\$29,801,119	\$25,772,222	\$35,835,198	\$44,309,839	\$40,284,513	--
<i>Annual Change</i>	--	-10.0%	-13.5%	39.0%	23.6%	-9.1%	4.0%
Materials/Supplies (a)	\$41,756,256	\$40,866,545	\$40,069,056	\$31,028,713	\$33,113,182	\$26,538,897	--
<i>Annual Change</i>	--	-2.1%	-2.0%	-22.6%	6.7%	-19.9%	-8.7%
Casualty/Liability	\$4,847,050	\$18,285,570	\$12,194,227	\$10,450,955	-\$2,448,161	\$16,391,228	--
<i>Annual Change</i>	--	277.3%	-33.3%	-14.3%	-123.4%	--	27.6%
Other Expenses (b)	\$2,190,097	\$2,611,743	\$5,674,608	\$4,770,917	\$4,826,667	\$3,060,109	--
<i>Annual Change</i>	--	19.3%	117.3%	-15.9%	1.2%	-36.6%	6.9%
<b>Total</b>	\$257,977,594	\$282,652,719	\$290,970,598	\$311,440,005	\$329,281,264	\$341,543,252	--
<i>Annual Change</i>	--	9.6%	2.9%	7.0%	5.7%	3.7%	5.8%
OPERATING STATISTICS							
Vehicle Service Hours	1,461,447	1,464,828	1,491,118	1,669,527	1,910,010	1,868,233	--
<i>Annual Change</i>	--	0.2%	1.8%	12.0%	14.4%	-2.2%	5.0%

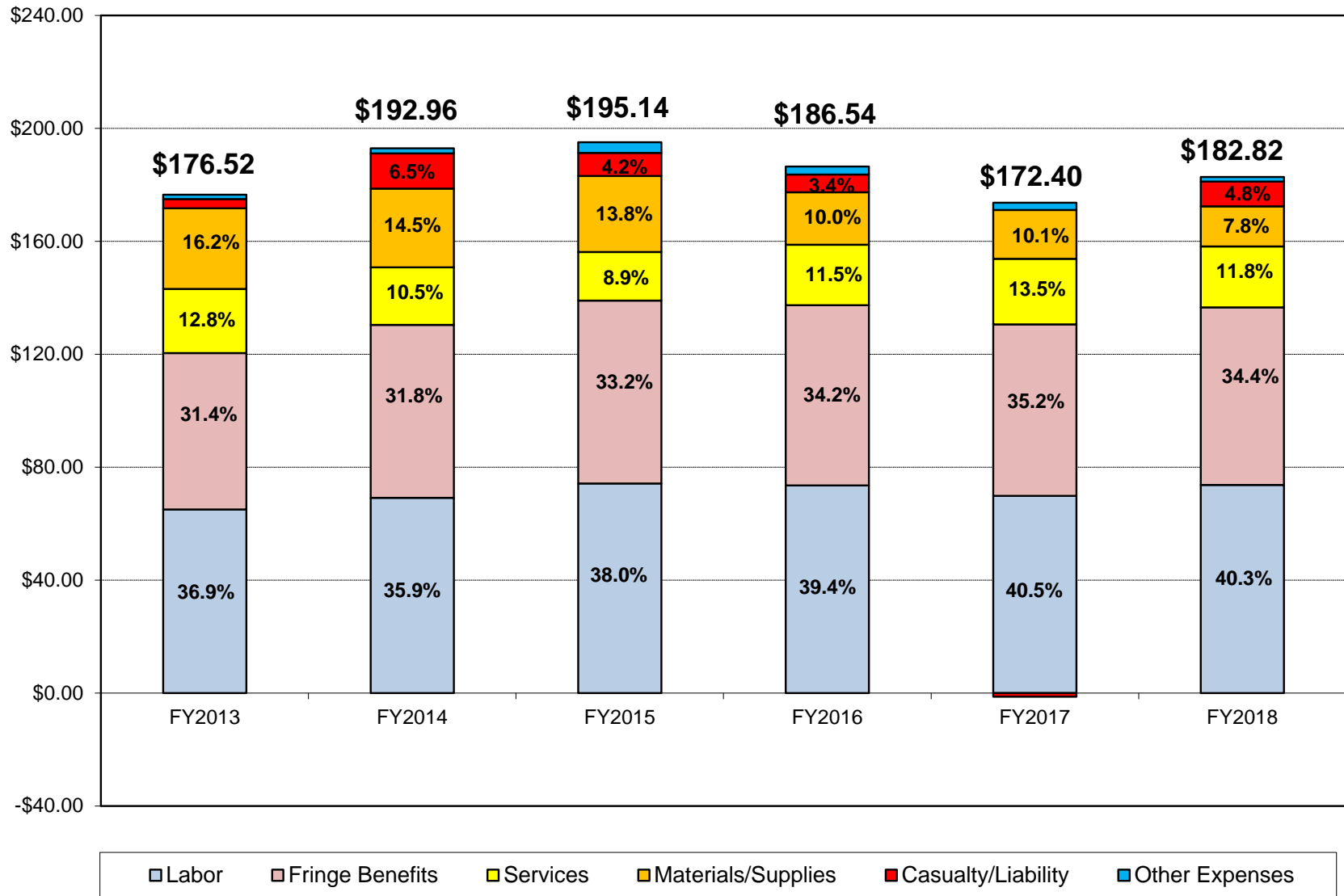
(a) Includes fuel/lubricants, tires/tubes and other materials/supplies

(b) Includes utilities and miscellaneous expenses

Sources: FY2013 through FY2015 – Prior Performance Audit Report; FY2016 through FY2018 - NTD Reports

### Exhibit 4.6: Distribution of Component Costs – Motor Coach

*Operating Cost per Vehicle Service Hour*



## Trolley Coach Performance Trends

This section provides an overview of the performance of SFMTA's trolley coach service over the past six years. The trends in the TDA indicators and input statistics are presented in Exhibit 5. The six-year trends are illustrated in Exhibits 5.1 through 5.4.

- Operating Cost per Vehicle Service Hour (Exhibit 5.1)
  - SFMTA's trolley coach cost per hour increased an average of 6.6 percent per year from FY2013 (\$149.28 per hour) to FY2018 (\$205.42 per hour).
  - The cost per hour increased in every year, with the largest annual increases in FY2015 (10.6 percent) and FY2018 (8.3 percent).
  - Inflation-adjusted results exhibit an average annual increase of 3.6 percent per year in constant FY2013 dollars.
- Passengers per Vehicle Service Hour (Exhibit 5.2)
  - Passengers per vehicle service hour decreased an average of 3.5 percent annually, reflecting an overall decrease in passengers combined with a smaller decrease in service hours.
  - Passengers per hour decreased overall from 68.9 in FY2013 to 57.5 in FY2018, with decreases occurring in almost every year.
- Passengers per Vehicle Service Mile (Exhibit 5.2)
  - The six-year trend in this indicator showed losses in every year starting in FY2015, with an overall average decrease of 2.8 percent annually.
  - There were 10.8 passengers per mile in FY2013 but only 9.4 in FY2018.
- Operating Cost per Passenger (Exhibit 5.3)
  - The trolley coach cost per passenger was \$2.17 in the first year of the review period. This was followed by increases in each year except FY2016, to \$3.57 per passenger in FY2018, or 10.5 percent annually.

- There were 15 percent annual increases in both of the most recent years, reflecting significantly declining ridership even as operating costs in FY2018 were almost the same as two years earlier.
- With the impact of inflation removed, the result was an average annual increase of 7.4 percent in the cost per passenger.
- Vehicle Service Hours per FTE (Exhibit 5.4)
  - Employee productivity decreased an average 5.1 percent per year over the six years.
  - Hours per FTE decreased overall from 1,079 in FY2013 to 828 in FY2018, with decreases in almost every year.
  - Vehicle service hours decreased somewhat overall during the period, but FTEs increased.

\* \* \* \* \*

The following is a brief summary of the TDA performance trend highlights over the six-year period of FY2013 through FY2018:

- There was an average annual increase in the operating cost per hour of 6.6 percent, or 3.6 percent in inflation adjusted dollars. Operating expenses increased by 4.4 percent per year overall, while vehicle service hours were reduced by two percent at the same time.
- The cost per passenger increased on average by 10.5 percent per year, which amounted to an average annual increase of 7.4 percent in constant FY2013 dollars. The cost per passenger increased, by at least eight percent, in every year except FY2016. Operating costs generally continued to rise while passenger levels declined significantly, especially toward the end of the period.

- Passenger productivity declined as well, with passengers per vehicle service hour decreasing by 3.5 percent per year overall, and passengers per vehicle service mile decreasing by 2.8 percent.
- Employee productivity decreased an average 5.1 percent per year.

### Exhibit 5: TDA Indicator Performance – Trolley Coach

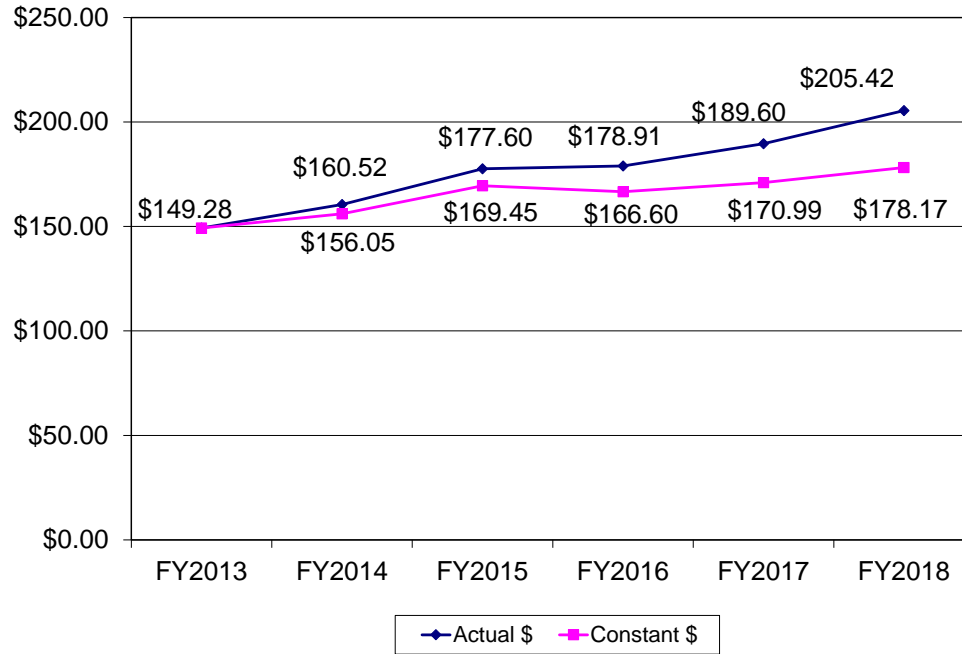
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Av. Ann. Chg.
<b>Performance Indicators</b>							
Op. Cost per Vehicle Svc. Hour (Actual \$)	\$149.28	\$160.52	\$177.60	\$178.91	\$189.60	\$205.42	- -
<i>Annual Change</i>	- -	7.5%	10.6%	0.7%	6.0%	8.3%	6.6%
Op. Cost per Vehicle Svc. Hour (Constant \$)	\$149.28	\$156.05	\$169.45	\$166.60	\$170.99	\$178.17	- -
<i>Annual Change</i>	- -	4.5%	8.6%	-1.7%	2.6%	4.2%	3.6%
Passengers per Vehicle Service Hour	68.9	68.7	64.5	66.5	61.1	57.5	- -
<i>Annual Change</i>	- -	-0.2%	-6.2%	3.2%	-8.1%	-5.8%	-3.5%
Passengers per Vehicle Service Mile	10.8	10.9	10.6	10.5	9.7	9.4	- -
<i>Annual Change</i>	- -	0.6%	-2.0%	-1.4%	-7.3%	-3.6%	-2.8%
Op. Cost per Passenger (Actual \$)	\$2.17	\$2.34	\$2.75	\$2.69	\$3.10	\$3.57	- -
<i>Annual Change</i>	- -	7.8%	18.0%	-2.4%	15.4%	15.0%	10.5%
Op. Cost per Passenger (Constant \$)	\$2.17	\$2.27	\$2.63	\$2.50	\$2.80	\$3.10	- -
<i>Annual Change</i>	- -	4.8%	15.8%	-4.7%	11.7%	10.6%	7.4%
Vehicle Service Hours per FTE	1,078.6	1,079.6	951.8	954.8	858.6	828.3	- -
<i>Annual Change</i>	- -	0.1%	-11.8%	0.3%	-10.1%	-3.5%	-5.1%
<b>Input Data</b>							
Operating Cost (Actual \$)	\$141,409,025	\$152,561,728	\$166,818,618	\$175,178,172	\$165,409,220	\$175,643,075	- -
<i>Annual Change</i>	- -	7.9%	9.3%	5.0%	-5.6%	6.2%	4.4%
Operating Cost (Constant \$)	\$141,409,025	\$148,314,438	\$159,167,133	\$163,121,195	\$149,171,979	\$152,346,560	- -
<i>Annual Change</i>	- -	4.9%	7.3%	2.5%	-8.6%	2.1%	1.5%
Vehicle Service Hours	947,295	950,442	939,313	979,125	872,395	855,063	- -
<i>Annual Change</i>	- -	0.3%	-1.2%	4.2%	-10.9%	-2.0%	-2.0%
Vehicle Service Miles	6,044,020	6,014,207	5,690,212	6,204,992	5,481,374	5,250,293	- -
<i>Annual Change</i>	- -	-0.5%	-5.4%	9.0%	-11.7%	-4.2%	-2.8%
Unlinked Passengers	65,247,637	65,328,431	60,553,936	65,120,886	53,301,250	49,199,803	- -
<i>Annual Change</i>	- -	0.1%	-7.3%	7.5%	-18.2%	-7.7%	-5.5%
Employee Full-Time Equivalents	878.3	880.3	986.9	1,025.5	1,016.1	1,032.3	- -
<i>Annual Change</i>	- -	0.2%	12.1%	3.9%	-0.9%	1.6%	3.3%
Bay Area CPI - Annual Change	- -	2.9%	1.9%	2.5%	3.3%	4.0%	- -
- Cumulative Change	- -	2.9%	4.8%	7.4%	10.9%	15.3%	2.9%

*Sources: FY2013 through FY2015 - Prior Performance Audit Report (FY2015 preliminary NTD results confirmed/adjusted per NTD Database)*

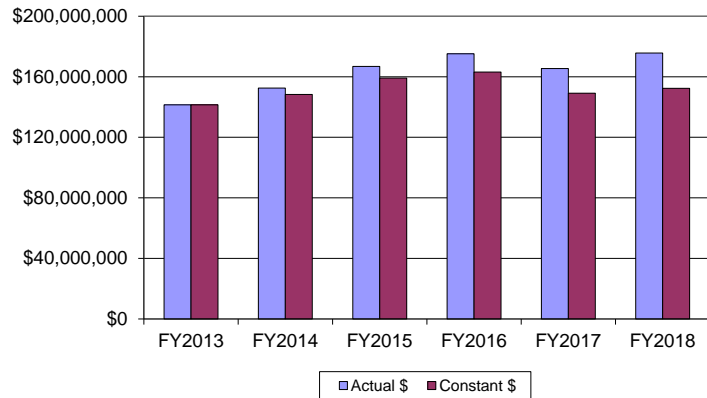
*FY2016 through FY2018 - NTD Reports (FY2018 NTD is preliminary)*

*CPI Data - U.S. Department of Labor, Bureau of Labor Statistics*

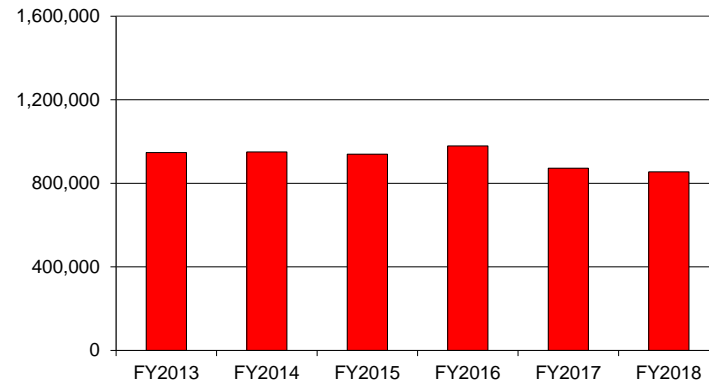
### Exhibit 5.1: Operating Cost per Vehicle Service Hour – Trolley Coach



#### Operating Cost

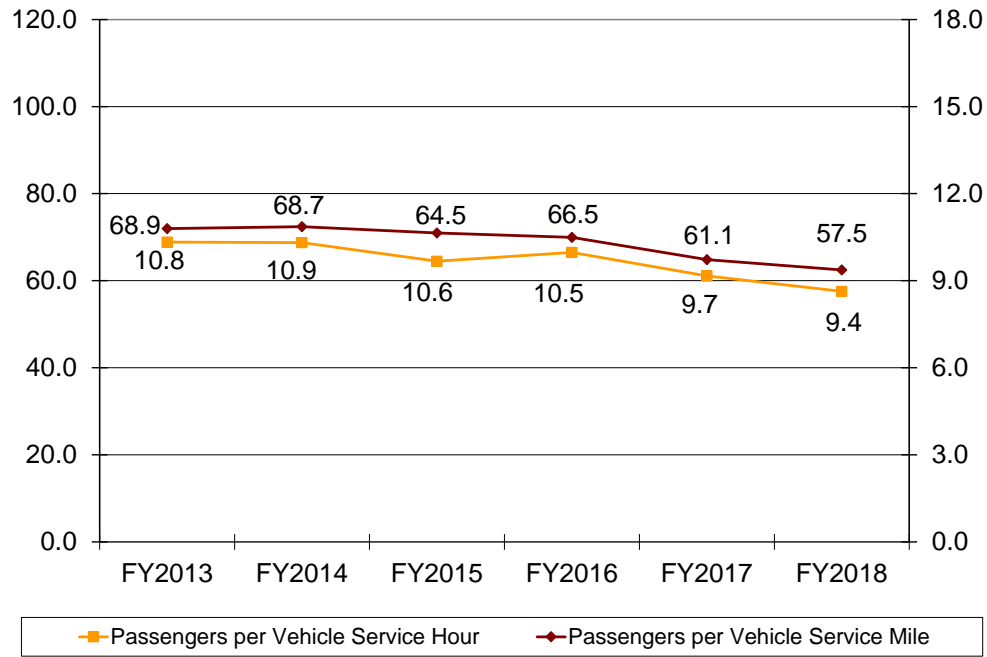


#### Vehicle Service Hours

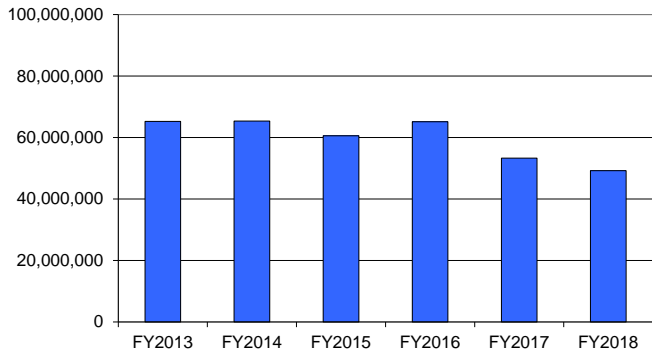




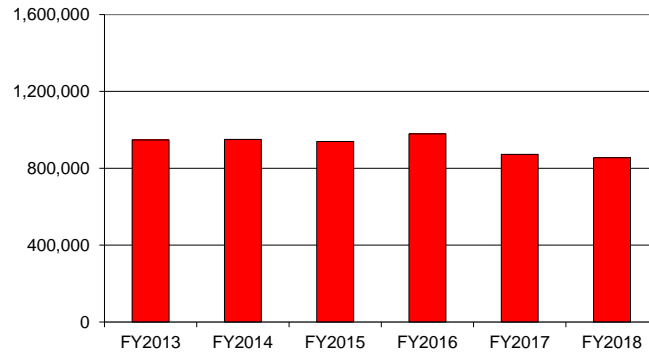
### Exhibit 5.2: Passengers per Hour and per Mile – Trolley Coach



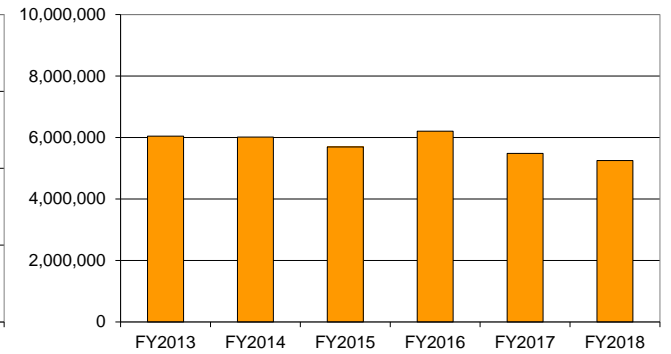
**Unlinked Passengers**



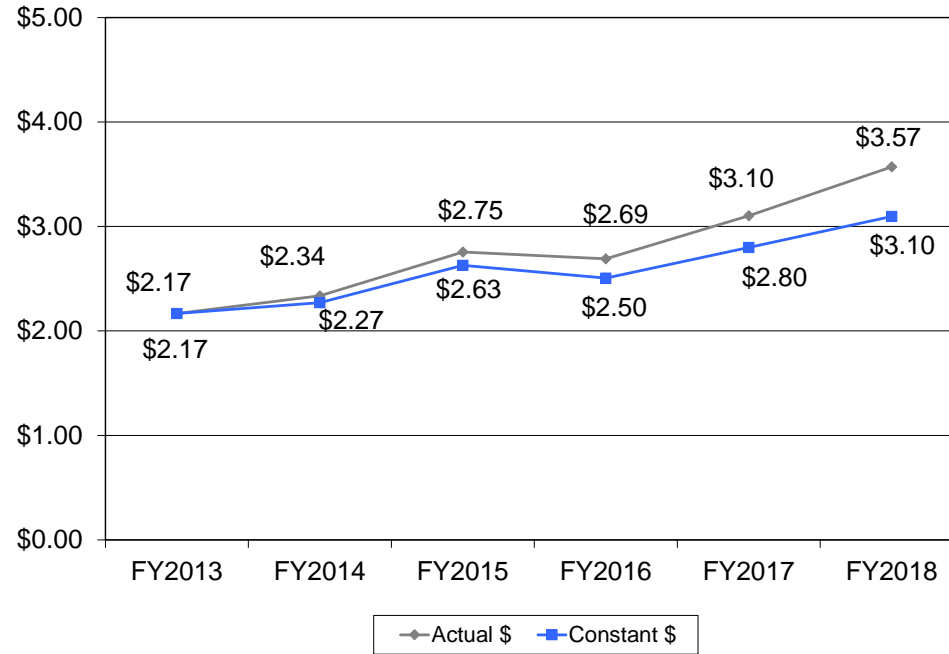
**Vehicle Service Hours**



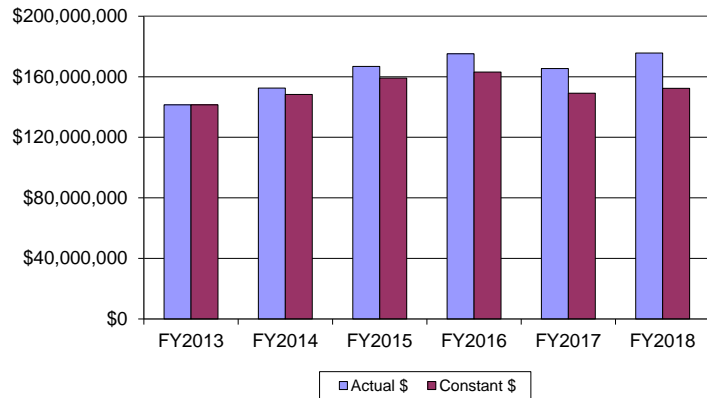
**Vehicle Service Miles**



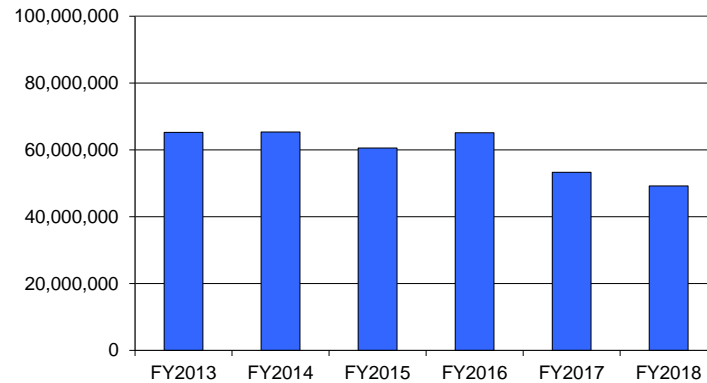
### Exhibit 5.3: Operating Cost per Passenger – Trolley Coach



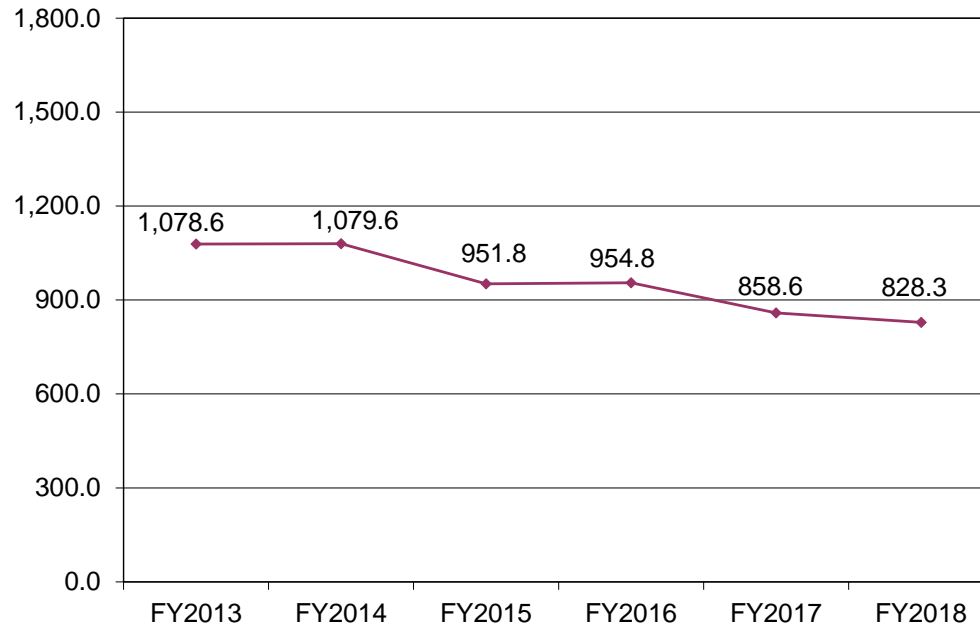
#### Operating Cost



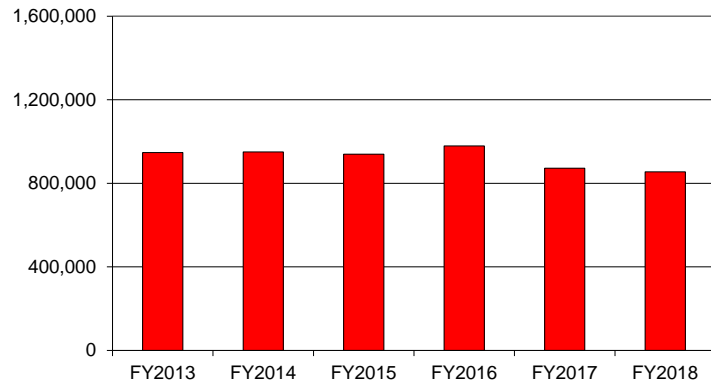
#### Unlinked Passengers



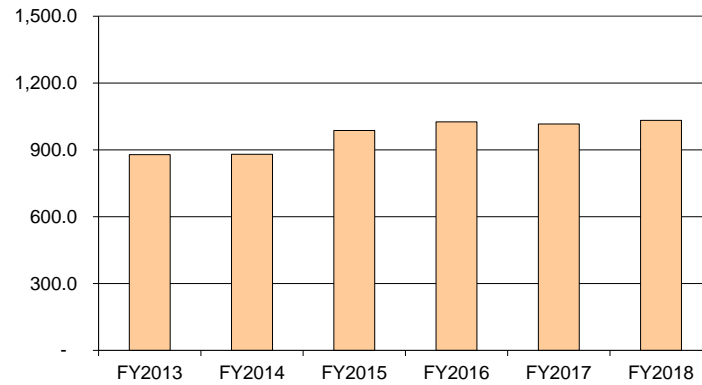
**Exhibit 5.4: Vehicle Service Hours per FTE – Trolley Coach**



**Vehicle Service Hours**



**Full-time Equivalent**



## Trolley Coach Component Costs

The year-to-year changes in selected operating cost categories are presented in Exhibit 5.5, along with the concurrent changes in vehicle service hours. The portions of the cost per vehicle service hour that can be attributed to each included cost component are shown in Exhibit 5.6.

- Between FY2013 and FY2018, total operating costs increased by 4.4 percent annually.
- The most significant change was an average annual increase of 21.5 percent in the casualty/liability area. In addition, a negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
- Labor costs represented the largest portion of the total costs, ranging between 40 and 45 percent over the period.
- Fringe benefits comprised the second largest portion, remaining about steady at 35 percent.
- Labor and fringe benefits costs both increased by 4.5 percent on average per year.
- Services costs contributed between 10 and 12 percent, and materials/supplies costs generally decreased over the period from seven to four percent of total costs.
- Other cost categories generally contributed less than 10 percent each.

\* \* \* \* \*

The following is a brief summary of the component operating costs trend highlights between FY2013 and FY2018:

- The most significant change was an average annual increase of 21.5 percent in the casualty/liability area. In addition, a negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
- Labor costs represented the largest portion of the total costs, with a share that ranged between 40 and 45 percent over the six years. Fringe benefits comprised the second largest portion, remaining at about 35 percent during the review period. Labor and fringe benefits costs both increased by about 4.5 percent on average per year.
- Materials/supplies costs generally decreased over the period, by 7.5 percent per year on average. At the same time, services and “other expenses” increased by about six and 14 percent per year on average, respectively.

### Exhibit 5.5: Component Cost Trends – Trolley Coach

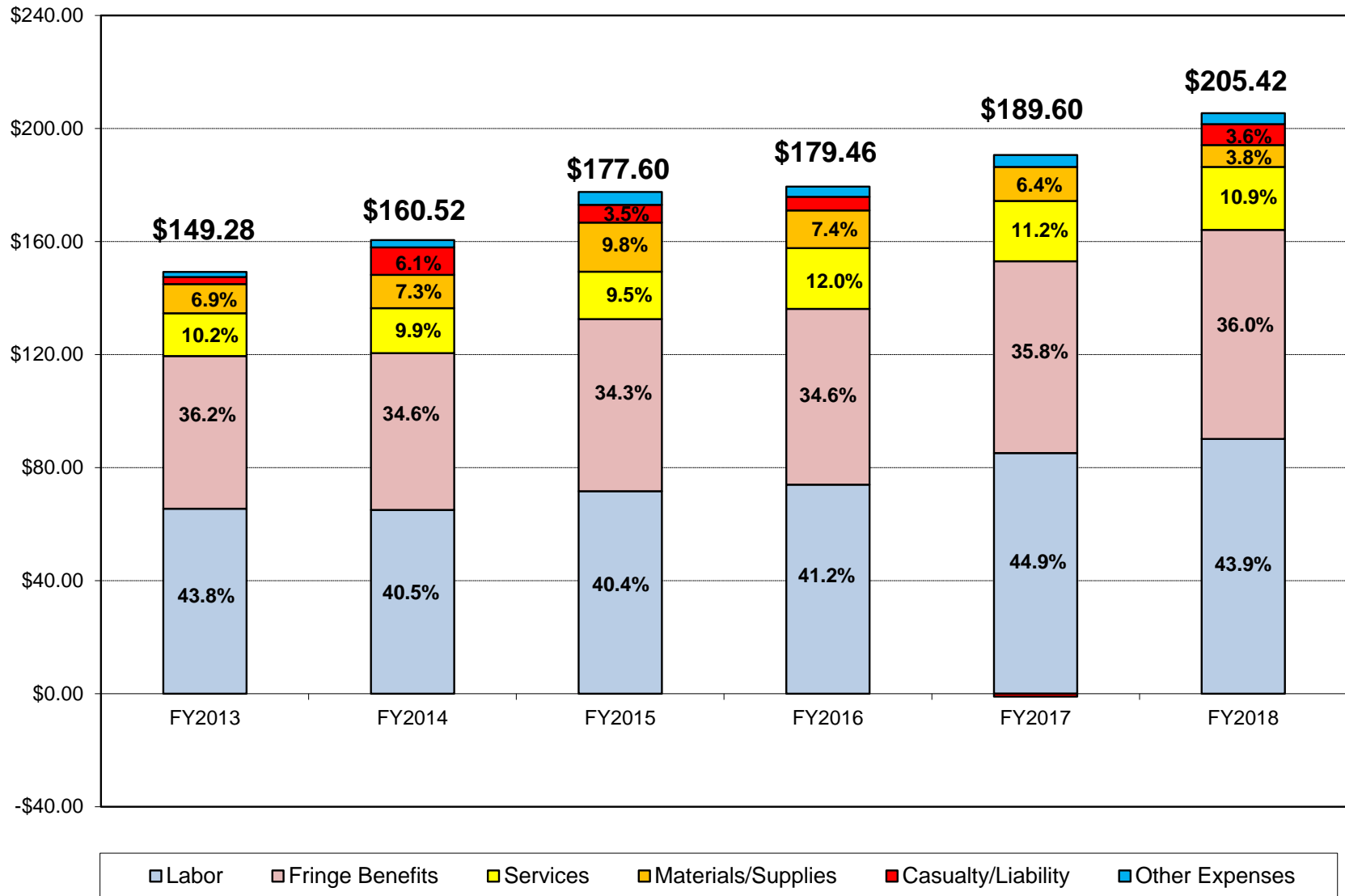
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Av. Ann. Chg.
COST CATEGORIES							
Labor (Salaries/Wages)	\$61,985,861	\$61,814,916	\$67,329,809	\$72,462,230	\$74,332,922	\$77,100,854	--
<i>Annual Change</i>	--	-0.3%	8.9%	7.6%	2.6%	3.7%	4.5%
Fringe Benefits	\$51,196,925	\$52,735,126	\$57,175,616	\$60,879,456	\$59,184,611	\$63,242,158	--
<i>Annual Change</i>	--	3.0%	8.4%	6.5%	-2.8%	6.9%	4.3%
Services	\$14,355,502	\$15,145,857	\$15,815,265	\$21,076,427	\$18,595,878	\$19,068,305	--
<i>Annual Change</i>	--	5.5%	4.4%	33.3%	-11.8%	2.5%	5.8%
Materials/Supplies (a)	\$9,799,732	\$11,181,039	\$16,280,204	\$13,022,552	\$10,550,786	\$6,649,840	--
<i>Annual Change</i>	--	14.1%	45.6%	-20.0%	-19.0%	-37.0%	-7.5%
Casualty/Liability	\$2,372,847	\$9,264,717	\$5,877,231	\$4,718,089	-\$899,267	\$6,275,401	--
<i>Annual Change</i>	--	290.4%	-36.6%	-19.7%	-119.1%	--	21.5%
Other Expenses (b)	\$1,698,158	\$2,420,073	\$4,340,493	\$3,559,418	\$3,644,290	\$3,306,517	--
<i>Annual Change</i>	--	42.5%	79.4%	-18.0%	2.4%	-9.3%	14.3%
<b>Total</b>	\$141,409,025	\$152,561,728	\$166,818,618	\$175,718,172	\$165,409,220	\$175,643,075	--
<i>Annual Change</i>	--	7.9%	9.3%	5.3%	-5.9%	6.2%	4.4%
OPERATING STATISTICS							
Vehicle Service Hours	947,295	950,442	939,313	979,125	872,395	855,063	--
<i>Annual Change</i>	--	0.3%	-1.2%	4.2%	-10.9%	-2.0%	-2.0%

(a) Includes fuel/lubricants, tires/tubes and other materials/supplies

(b) Includes utilities and miscellaneous expenses

Sources: FY2013 through FY2015 – Prior Performance Audit Report; FY2016 through FY2018 - NTD Reports

**Exhibit 5.6: Distribution of Component Costs – Trolley Coach**  
*Operating Cost per Vehicle Service Hour*



## Light Rail Performance Trends

This section provides an overview of the performance of SFMTA's light rail service over the past six years. Performance of the historic trolley service ("E" and "F" Lines) is included as well as the Muni Metro light rail lines in operation during the audit period. The trends in the TDA indicators and input statistics are presented in Exhibit 6. The six-year trends are illustrated in Exhibits 6.1 through 6.4.

- Operating Cost per Car Service Hour (Exhibit 6.1)
  - Light rail cost efficiency declined an average of five percent per year from FY2013 (\$302.89 per hour) to FY2018 (\$386.66 per hour).
  - The cost per hour increased and decreased in alternate years through the period.
  - The steepest annual increase was nearly 30 percent, between FY2013 and FY2014. SFMTA attributes the latter increase largely to a change in data methodology that attempted to more accurately capture missed service through enhanced use of the Central Control Logs and the Automatic Train Control System (ACTS). This resulted in a significant reduction in service hours being reported.
  - The cost per hour trend showed a 13 percent increase in the last year, as operating costs increased by 6.3 percent from the year before while car service hours decreased by a corresponding amount.
  - Inflation-adjusted results exhibit an average annual increase of 2.1 percent per year in constant FY2013 dollars.
  
- Passengers per Car Service Hour (Exhibit 6.2)
  - Passengers per car service hour increased an average of 1.4 percent annually, reflecting an overall increase in passengers combined with a smaller decrease in service hours.



- Passengers per hour increased overall from 82.0 in FY2013 to 87.8 in FY2018. Higher levels were achieved in most of the interim years.
- Passengers per Car Service Mile (Exhibit 6.2)
  - The six-year trend in this indicator was similar to passengers per hour, increasing by 1.6 percent annually on average.
  - There were 9.2 passengers per mile in FY2013, compared with 9.9 in FY2018, and a period high of 10.8 in both FY2014 and FY2015.
- Operating Cost per Passenger (Exhibit 6.3)
  - The cost per passenger was \$3.69 in the first year of the review period, followed small decreases in the next two years and larger increases subsequently.
  - In FY2018, the cost per passenger reached a period high of \$4.40, which was 8.4 percent higher than the result in FY2017.
  - There was an average annual increase of 3.6 percent in this indicator over the six years.
  - With the impact of inflation removed, the result was an average annual increase of 0.7 percent in the cost per passenger
- Car Service Hours per FTE (Exhibit 6.4)
  - Employee productivity decreased by an average 5.3 percent per year over the six years.
  - Hours per FTE decreased overall during the period from 700 to 533, with significant annual reductions in FY2014 and FY2018, and increases of less magnitude in the remaining years.
  - Car service hours decreased slightly overall during the period, but FTEs increased.

\* \* \* \* \*

The following is a brief summary of the TDA performance trend highlights over the six-year period of FY2013 through FY2018:

- There was an average annual increase in the operating cost per hour of five percent, or 2.1 percent in inflation adjusted dollars. Operating expenses increased by 4.9 percent per year overall, while car service hours were reduced by less than one percent at the same time.
- The cost per passenger increased on average by 3.6 percent per year, which amounted to an average annual increase of 0.7 percent in constant FY2013 dollars. The cost per passenger increased primarily toward the end of the review period, as operating costs continued to increase while passenger levels began to decline somewhat.
- Passenger productivity improved over the period, with passengers per car service hour increasing by 1.4 percent per year overall, and passengers per car service mile increasing by 1.6 percent.
- Employee productivity decreased an average 5.3 percent per year.

### Exhibit 6: TDA Indicator Performance – Light Rail

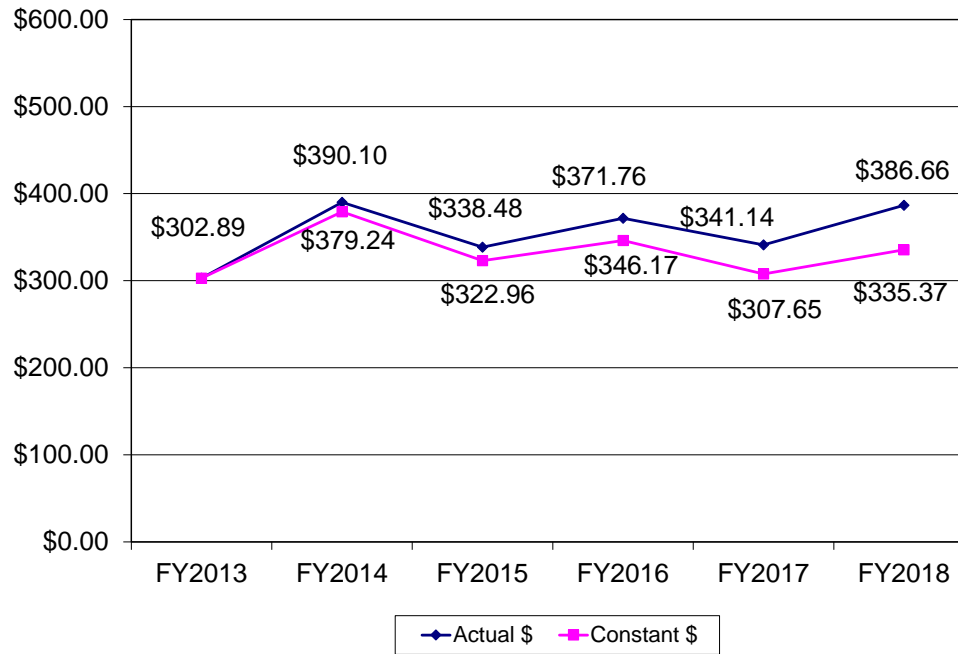
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Av. Ann. Chg.
<b>Performance Indicators</b>							
Op. Cost per Car Svc. Hour (Actual \$)	\$302.89	\$390.10	\$338.48	\$371.76	\$341.14	\$386.66	- -
<i>Annual Change</i>	- -	28.8%	-13.2%	9.8%	-8.2%	13.3%	5.0%
Op. Cost per Car Svc. Hour (Constant \$)	\$302.89	\$379.24	\$322.96	\$346.17	\$307.65	\$335.37	- -
<i>Annual Change</i>	- -	25.2%	-14.8%	7.2%	-11.1%	9.0%	2.1%
Passengers per Car Service Hour	82.0	106.9	94.1	94.0	84.0	87.8	- -
<i>Annual Change</i>	- -	30.3%	-12.0%	-0.1%	-10.7%	4.6%	1.4%
Passengers per Car Service Mile	9.2	10.8	10.8	10.5	9.3	9.9	- -
<i>Annual Change</i>	- -	17.9%	-0.2%	-3.1%	-11.3%	6.7%	1.6%
Op. Cost per Passenger (Actual \$)	\$3.69	\$3.65	\$3.60	\$3.95	\$4.06	\$4.40	- -
<i>Annual Change</i>	- -	-1.2%	-1.4%	9.9%	2.8%	8.4%	3.6%
Op. Cost per Passenger (Constant \$)	\$3.69	\$3.55	\$3.43	\$3.68	\$3.66	\$3.82	- -
<i>Annual Change</i>	- -	-3.9%	-3.3%	7.3%	-0.5%	4.3%	0.7%
Car Service Hours per FTE	700.0	519.3	560.0	579.5	592.3	533.2	- -
<i>Annual Change</i>	- -	-25.8%	7.8%	3.5%	2.2%	-10.0%	-5.3%
<b>Input Data</b>							
Operating Cost (Actual \$)	\$198,475,301	\$207,882,197	\$204,804,984	\$235,597,442	\$237,569,785	\$252,428,452	- -
<i>Annual Change</i>	- -	4.7%	-1.5%	15.0%	0.8%	6.3%	4.9%
Operating Cost (Constant \$)	\$198,475,301	\$202,094,796	\$195,411,175	\$219,381,992	\$214,248,970	\$218,947,467	- -
<i>Annual Change</i>	- -	1.8%	-3.3%	12.3%	-2.3%	2.2%	2.0%
Car Service Hours	655,262	532,901	605,066	633,736	696,396	652,845	- -
<i>Annual Change</i>	- -	-18.7%	13.5%	4.7%	9.9%	-6.3%	-0.1%
Car Service Miles	5,859,656	5,264,532	5,271,803	5,691,158	6,296,563	5,782,528	- -
<i>Annual Change</i>	- -	-10.2%	0.1%	8.0%	10.6%	-8.2%	-0.3%
Unlinked Passengers	53,749,159	56,951,602	56,932,671	59,580,128	58,465,020	57,309,366	- -
<i>Annual Change</i>	- -	6.0%	0.0%	4.7%	-1.9%	-2.0%	1.3%
Employee Full-Time Equivalents	936.1	1,026.2	1,080.5	1,093.6	1,175.8	1,224.5	- -
<i>Annual Change</i>	- -	9.6%	5.3%	1.2%	7.5%	4.1%	5.5%
Bay Area CPI - Annual Change	- -	2.9%	1.9%	2.5%	3.3%	4.0%	- -
- Cumulative Change	- -	2.9%	4.8%	7.4%	10.9%	15.3%	2.9%

*Sources: FY2013 through FY2015 - Prior Performance Audit Report (FY2015 preliminary NTD results confirmed/adjusted per NTD Database)*

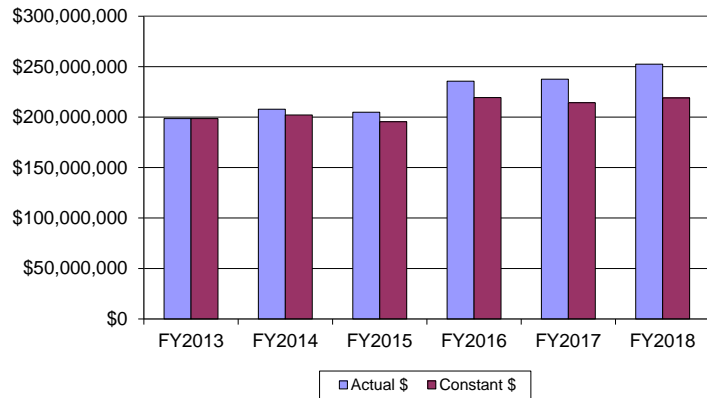
*FY2016 through FY2018 - NTD Reports (FY2018 NTD is preliminary)*

*CPI Data - U.S. Department of Labor, Bureau of Labor Statistics*

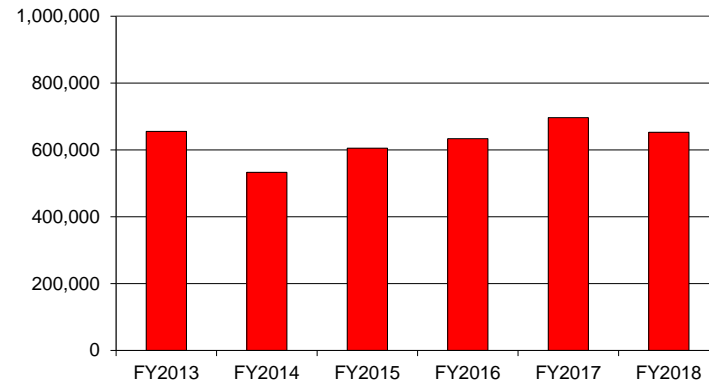
### Exhibit 6.1: Operating Cost per Car Service Hour – Light Rail



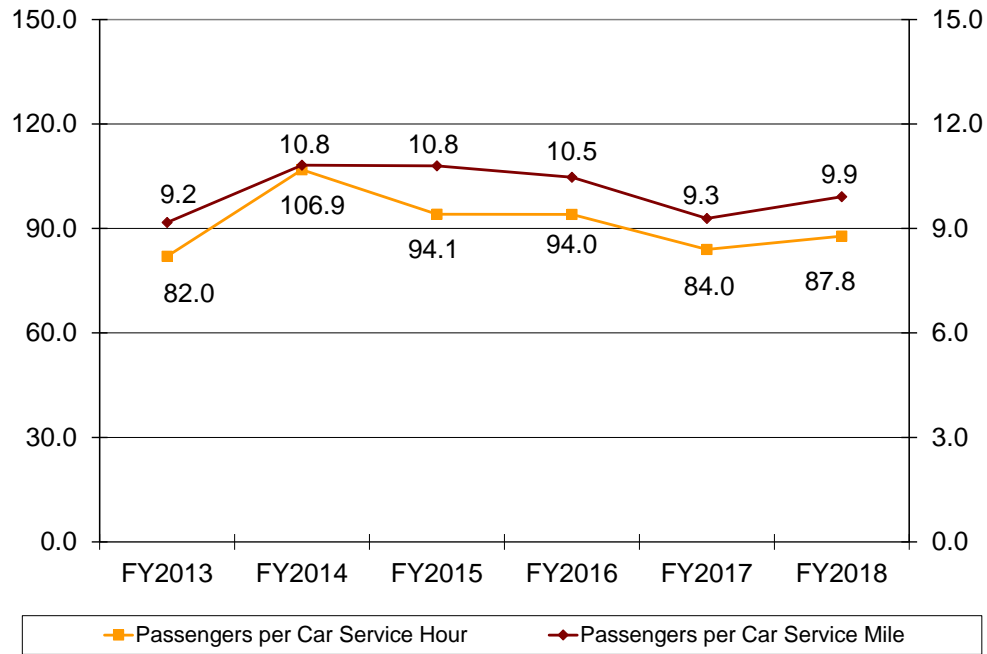
#### Operating Cost



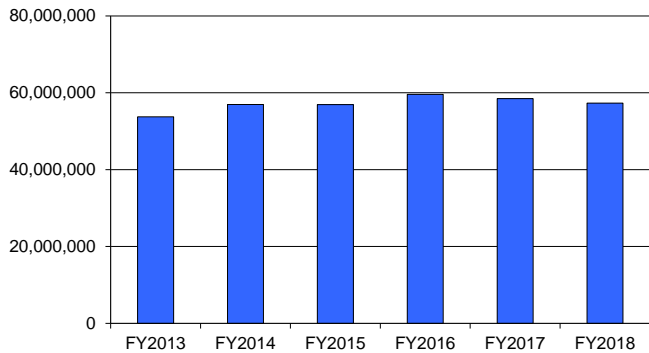
#### Car Service Hours



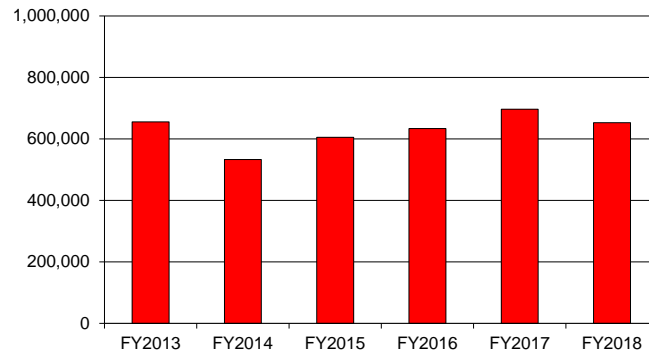
### Exhibit 6.2: Passengers per Hour and per Mile – Light Rail



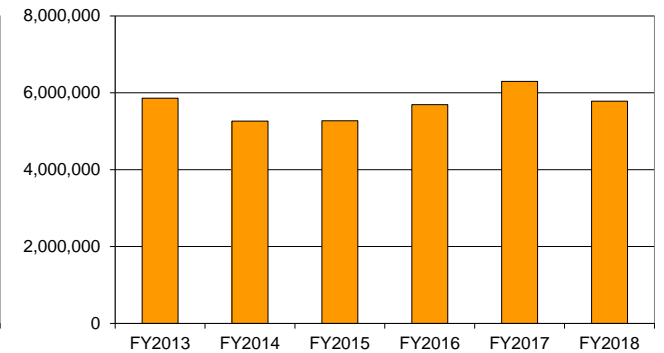
**Unlinked Passengers**



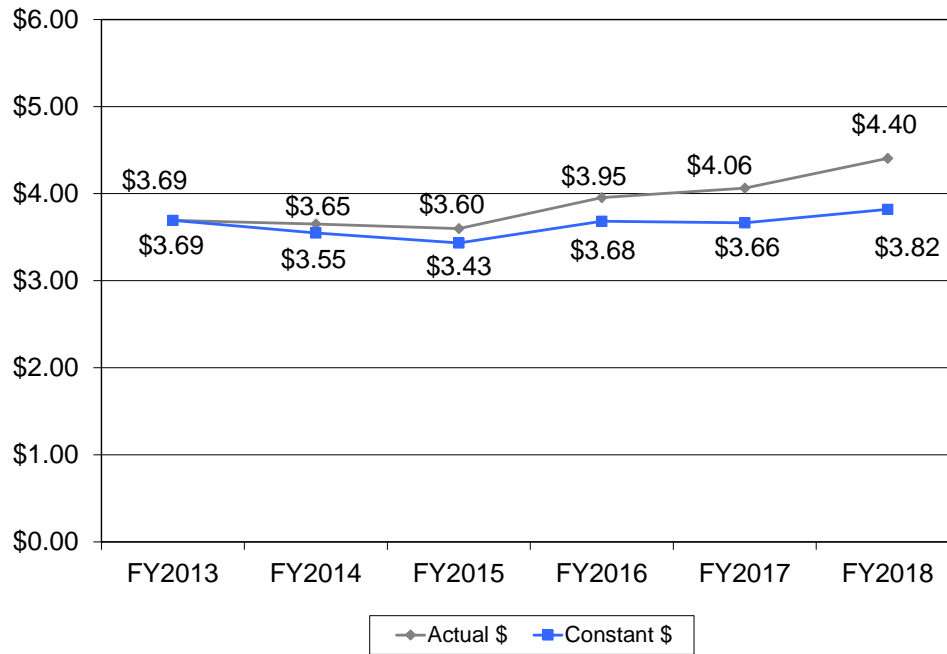
**Car Service Hours**



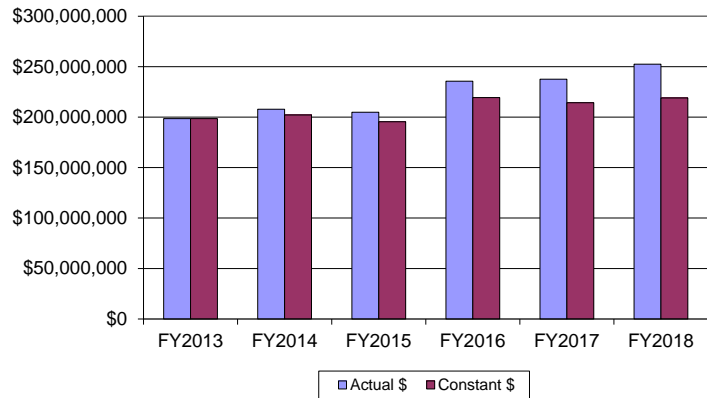
**Car Service Miles**



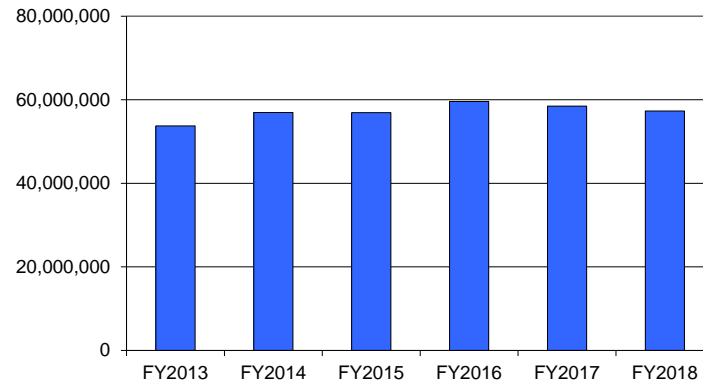
### Exhibit 6.3: Operating Cost per Passenger – Light Rail



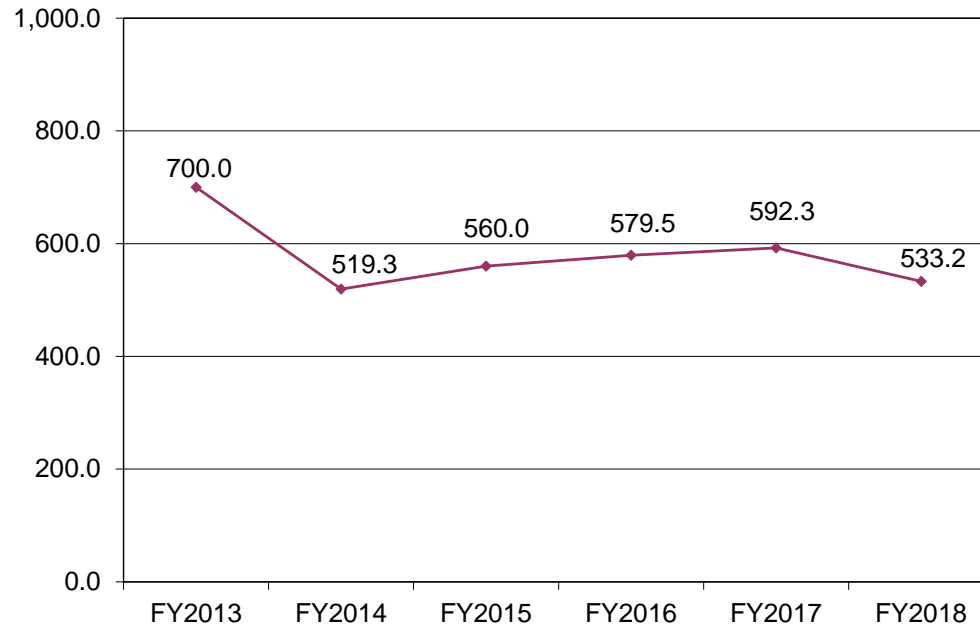
#### Operating Cost



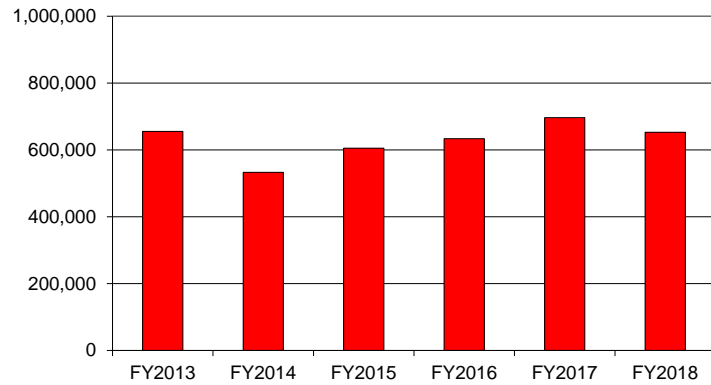
#### Unlinked Passengers



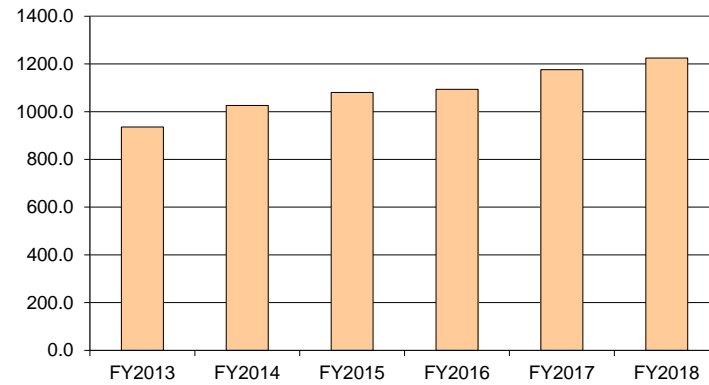
**Exhibit 6.4: Car Service Hours per FTE – Light Rail**



**Car Service Hours**



**Full-time Equivalent**



## Light Rail Component Costs

The year-to-year changes in selected operating cost categories are presented in Exhibit 6.5, along with the concurrent changes in car service hours. The portions of the cost per car service hour that can be attributed to each included cost component are shown in Exhibit 6.6.

- Between FY2013 and FY2018, total operating costs increased by 4.9 percent annually.
- The most significant change was an average annual increase of 22.7 percent in the casualty/liability area. In addition, a negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
- Labor costs represented the largest portion of the total costs, contributing about 40 percent throughout the review period.
- Fringe benefits comprised the second largest portion, in a range of 30 to 35 percent of total costs.
- Labor and fringe benefits costs both increased by six percent on average per year.
- Services costs increased by about five percent annually, while materials/supplies costs generally decreased over the period, by 2.2 percent per year on average.
- The “other expenses” category showed an increase of 12 percent per year on average.

\* \* \* \* \*



The following is a brief summary of the component operating costs trend highlights between FY2013 and FY2018:

- The most significant change was an average annual increase of nearly 23 percent in the casualty/liability area. In addition, a negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
- Labor costs represented the largest portion of the total costs, with a share of about 40 percent over the six years. Fringe benefits comprised the second largest portion, remaining in a range of 30 to 35 percent during the review period. Labor and fringe benefits costs both increased by about six percent on average per year.
- Materials/supplies costs generally decreased over the period, by 2.2 percent per year on average. At the same time, services and “other expenses” increased by about five and 12 percent per year on average, respectively.

### Exhibit 6.5: Component Cost Trends – Light Rail

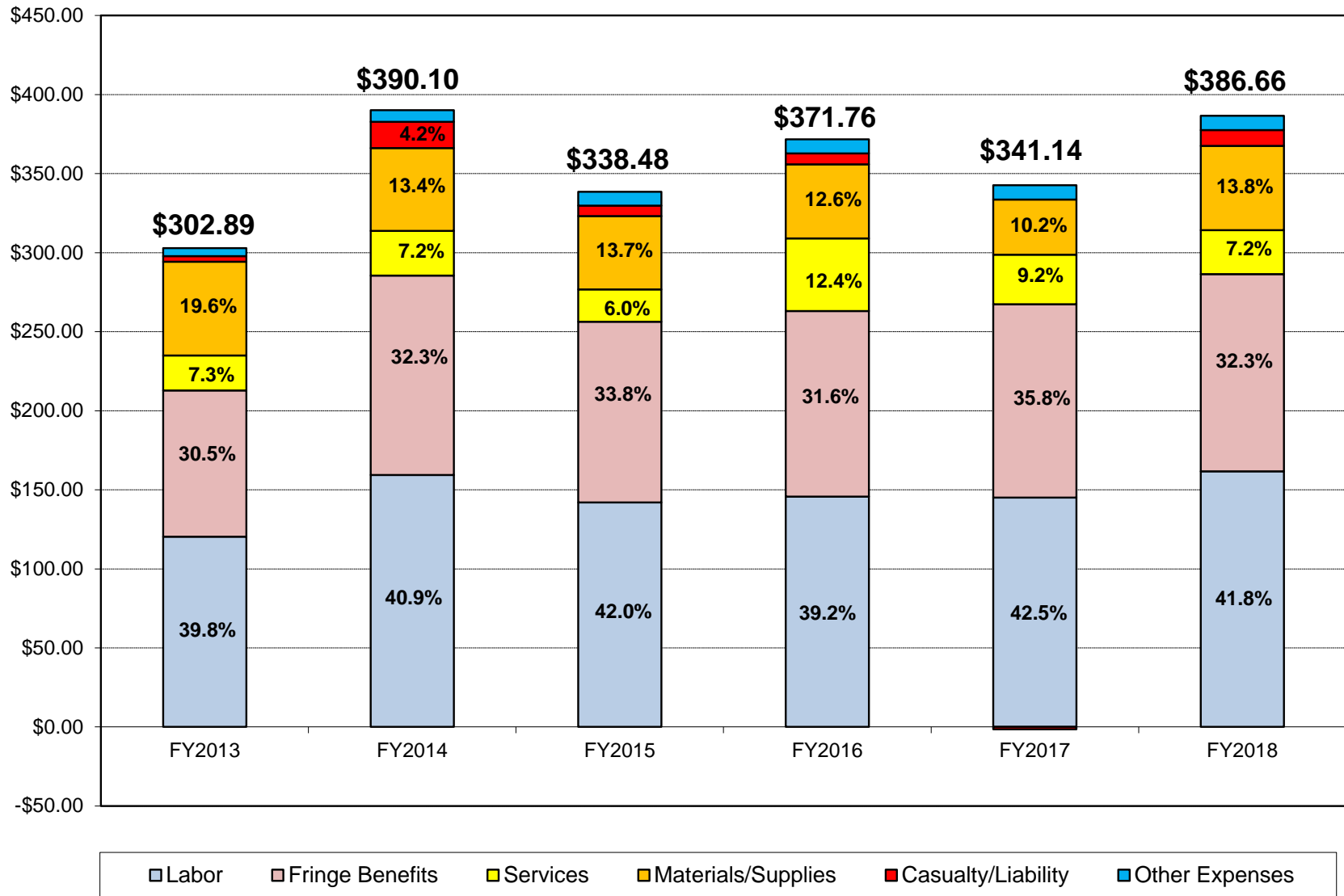
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Av. Ann. Chg.
COST CATEGORIES							
Labor (Salaries/Wages)	\$78,907,649	\$84,953,289	\$85,945,006	\$92,387,673	\$101,030,943	\$105,546,692	--
<i>Annual Change</i>	--	7.7%	1.2%	7.5%	9.4%	4.5%	6.0%
Fringe Benefits	\$60,560,843	\$67,227,019	\$69,176,073	\$74,344,102	\$85,136,329	\$81,477,815	--
<i>Annual Change</i>	--	11.0%	2.9%	7.5%	14.5%	-4.3%	6.1%
Services	\$14,501,904	\$15,032,943	\$12,363,210	\$29,102,636	\$21,819,137	\$18,163,474	--
<i>Annual Change</i>	--	3.7%	-17.8%	135.4%	-25.0%	-16.8%	4.6%
Materials/Supplies (a)	\$38,814,235	\$27,933,144	\$28,090,484	\$29,661,569	\$24,309,126	\$34,805,279	--
<i>Annual Change</i>	--	-28.0%	0.6%	5.6%	-18.0%	43.2%	-2.2%
Casualty/Liability	\$2,328,880	\$8,792,585	\$3,923,766	\$4,391,110	-\$1,033,006	\$6,480,251	--
<i>Annual Change</i>	--	277.5%	-55.4%	11.9%	-123.5%	--	22.7%
Other Expenses (b)	\$3,361,790	\$3,943,217	\$5,306,445	\$5,710,352	\$6,307,256	\$5,954,941	--
<i>Annual Change</i>	--	17.3%	34.6%	7.6%	10.5%	-5.6%	12.1%
<b>Total</b>	\$198,475,301	\$207,882,197	\$204,804,984	\$235,597,442	\$237,569,785	\$252,428,452	--
<i>Annual Change</i>	--	4.7%	-1.5%	15.0%	0.8%	6.3%	4.9%
OPERATING STATISTICS							
Vehicle Service Hours	655,262	532,901	605,066	633,736	696,396	652,845	--
<i>Annual Change</i>	--	-18.7%	13.5%	4.7%	9.9%	-6.3%	-0.1%

(a) Includes fuels/lubricants, tires/tubes and other materials/supplies

(b) Includes utilities and miscellaneous expenses

Sources: FY2013 through FY2015 – Prior Performance Audit Report; FY2016 through FY2018 - NTD Reports

**Exhibit 6.6: Distribution of Component Costs – Light Rail**  
*Operating Cost per Car Service Hour*



## Cable Car Performance Trends

This section provides an overview of the performance of SFMTA's cable car service over the past six years. The trends in the TDA indicators and input statistics are presented in Exhibit 7. The six-year trends are illustrated in Exhibits 7.1 through 7.4.

- Operating Cost per Car Service Hour (Exhibit 7.1)
  - Cable car cost efficiency declined overall, by an average of 5.1 percent per year from FY2013 (\$365.62 per hour) to FY2018 (\$467.84 per hour).
  - Operating expenses increased by more than five percent per year overall, while car service hours went up by less than one percent.
  - SFMTA attributed a nearly 20 percent increase in FY2015 largely to a change in data methodology, attempting to more accurately capture missed service through enhanced use of the Central Control Logs. This resulted in a significant reduction in service hours reported in that year.
  - The inflation-adjusted results exhibit an average annual decrease of 2.1 percent per year in constant FY2013 dollars.
- Passengers per Car Service Hour (Exhibit 7.2)
  - Passengers per car service hour decreased an average of 2.1 percent annually, reflecting an overall decrease in passengers combined with a smaller increase in service hours.
  - Passengers per hour decreased overall from 48.0 in FY2013 to 43.3 in FY2018. However, a period high of 51.1 passengers was achieved in FY2014, and a period low of 41.7 reached in FY2016.
- Passengers per Car Service Mile (Exhibit 7.2)
  - The six-year trend showed a decrease of 1.5 percent annually on average. There were 22.7 passengers per mile in FY2013, compared with 21.1 in FY2018.

- Overall, both passengers and service miles went down, but the former went down at a somewhat higher rate.
- Operating Cost per Passenger (Exhibit 7.3)
  - The cost per passenger of \$7.61 in the first year was followed by a decrease in the next year, and then increases in all the later years.
  - The most significant annual increase was 22.6 percent, to \$8.72 per passenger in FY2015.
  - The overall period result was an average annual increase of 7.3 percent over the six years.
  - With the impact of inflation removed, the result was an average annual increase of 4.3 percent in the cost per passenger.
- Car Service Hours per FTE (Exhibit 7.4)
  - Employee productivity decreased an average 2.6 percent per year over the six years.
  - Hours per FTE decreased overall from 387 in FY2013 to 339 in FY2018, with levels as low as 321 hours recorded in the interim.
  - FTEs increased overall at a higher rate than car service hours during the review period.

\* \* \* \* \*

The following is a brief summary of the TDA performance trend highlights over the six-year period of FY2013 through FY2018:

- There was an average annual increase in the operating cost per hour of 5.1 percent, or 2.1 percent in inflation adjusted dollars. Operating expenses increased by more than five percent per year overall, while car service hours went up by less than one percent.

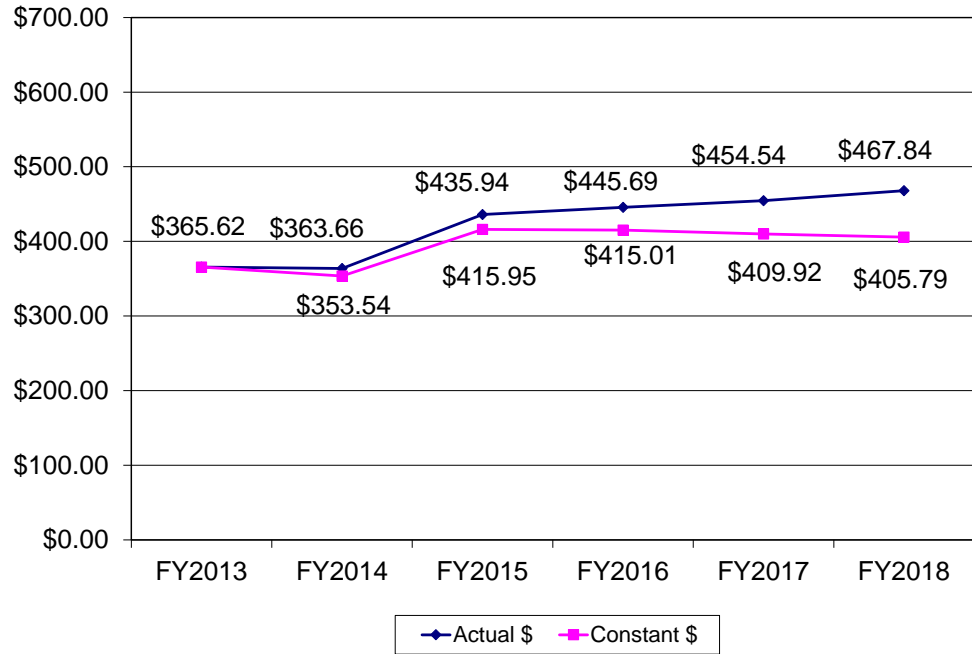
- The cost per passenger increased on average by 7.3 percent per year, which amounted to an average annual increase of 4.3 percent in constant FY2013 dollars. The cost per passenger increased primarily in the middle years of the review period, by more than 20 percent in both FY2015 and FY2016.
- Passenger productivity declined somewhat over the period, with passengers per car service hour decreasing by 2.1 percent per year overall, and passengers per car service mile decreasing by 1.5 percent.
- Employee productivity decreased an average 2.6 percent per year.

### Exhibit 7: TDA Indicator Performance – Cable Car

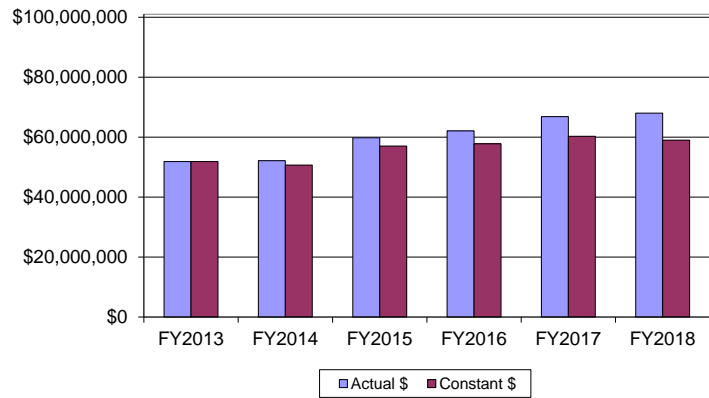
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Av. Ann. Chg.
<b>Performance Indicators</b>							
Op. Cost per Car Svc. Hour (Actual \$)	\$365.62	\$363.66	\$435.94	\$445.69	\$454.54	\$467.84	- -
<i>Annual Change</i>	- -	-0.5%	19.9%	2.2%	2.0%	2.9%	5.1%
Op. Cost per Car Svc. Hour (Constant \$)	\$365.62	\$353.54	\$415.95	\$415.01	\$409.92	\$405.79	- -
<i>Annual Change</i>	- -	-3.3%	17.7%	-0.2%	-1.2%	-1.0%	2.1%
Passengers per Car Service Hour	48.0	51.1	49.9	41.7	42.3	43.3	- -
<i>Annual Change</i>	- -	6.5%	-2.5%	-16.4%	1.6%	2.3%	-2.1%
Passengers per Car Service Mile	22.7	25.1	24.6	22.4	23.6	21.1	- -
<i>Annual Change</i>	- -	10.6%	-2.2%	-8.6%	5.0%	-10.4%	-1.5%
Op. Cost per Passenger (Actual \$)	\$7.61	\$7.11	\$8.74	\$10.70	\$10.74	\$10.81	- -
<i>Annual Change</i>	- -	-6.6%	23.0%	22.4%	0.4%	0.6%	7.3%
Op. Cost per Passenger (Constant \$)	\$7.61	\$6.91	\$8.34	\$9.96	\$9.69	\$9.38	- -
<i>Annual Change</i>	- -	-9.2%	20.7%	19.4%	-2.8%	-3.2%	4.3%
Car Service Hours per FTE	387.3	378.6	320.9	342.0	336.8	338.9	- -
<i>Annual Change</i>	- -	-2.2%	-15.2%	6.6%	-1.5%	0.6%	-2.6%
<b>Input Data</b>							
Operating Cost (Actual \$)	\$51,868,243	\$52,143,335	\$59,761,428	\$62,057,044	\$66,854,982	\$68,022,089	- -
<i>Annual Change</i>	- -	0.5%	14.6%	3.8%	7.7%	1.7%	5.6%
Operating Cost (Constant \$)	\$51,868,243	\$50,691,674	\$57,020,345	\$57,785,848	\$60,292,225	\$58,999,942	- -
<i>Annual Change</i>	- -	-2.3%	12.5%	1.3%	4.3%	-2.1%	2.6%
Car Service Hours	141,863	143,383	137,085	139,238	147,083	145,396	- -
<i>Annual Change</i>	- -	1.1%	-4.4%	1.6%	5.6%	-1.1%	0.5%
Car Service Miles	299,841	291,853	278,250	258,452	264,247	298,274	- -
<i>Annual Change</i>	- -	-2.7%	-4.7%	-7.1%	2.2%	12.9%	-0.1%
Unlinked Passengers	6,813,349	7,331,777	6,834,184	5,800,222	6,224,072	6,292,346	- -
<i>Annual Change</i>	- -	7.6%	-6.8%	-15.1%	7.3%	1.1%	-1.6%
Employee Full-Time Equivalents	366.3	378.7	427.2	407.1	436.7	429.0	- -
<i>Annual Change</i>	- -	3.4%	12.8%	-4.7%	7.3%	-1.8%	3.2%
Bay Area CPI - Annual Change	- -	2.9%	1.9%	2.5%	3.3%	4.0%	- -
- Cumulative Change	- -	2.9%	4.8%	7.4%	10.9%	15.3%	2.9%

Sources: FY2013 through FY2015 - Prior Performance Audit Report (FY2015 preliminary NTD results confirmed/adjusted per NTD Database)  
FY2016 through FY2018 - NTD Reports (FY2018 NTD is preliminary)  
CPI Data - U.S. Department of Labor, Bureau of Labor Statistics

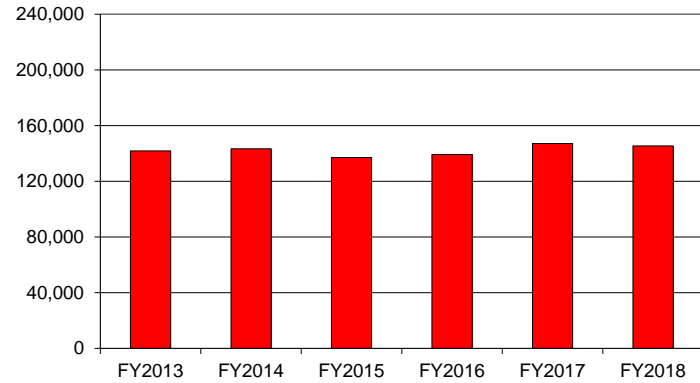
### Exhibit 7.1: Operating Cost per Car Service Hour – Cable Car



#### Operating Cost

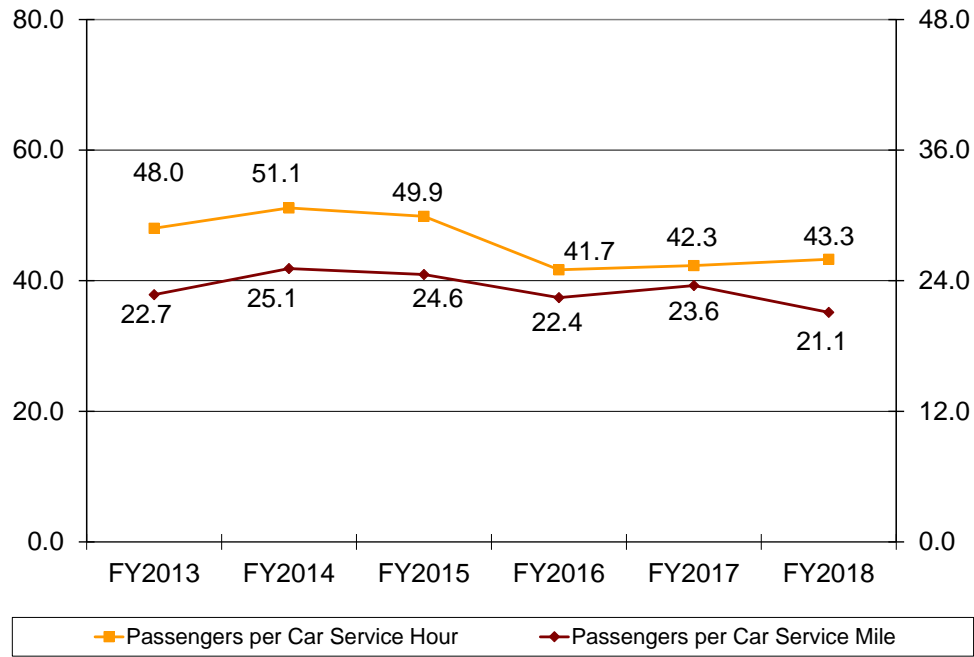


#### Car Service Hours

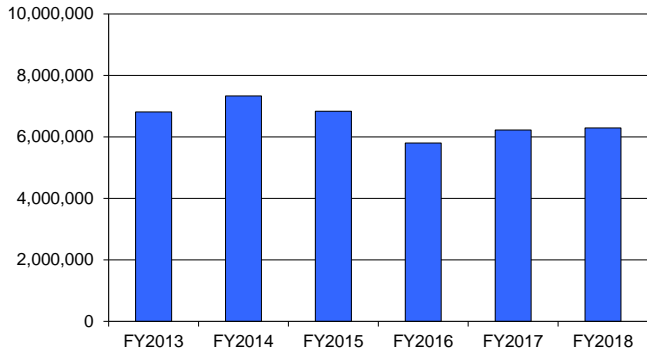




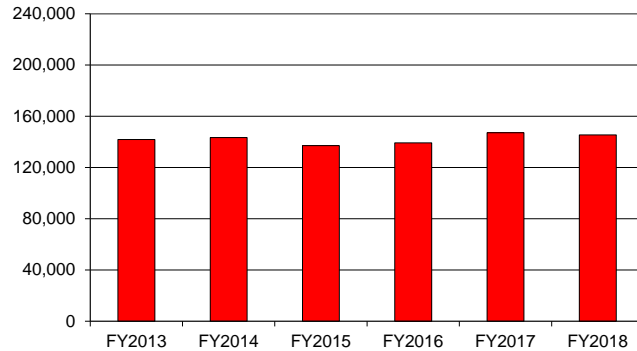
### Exhibit 7.2: Passengers per Hour and per Mile – Cable Car



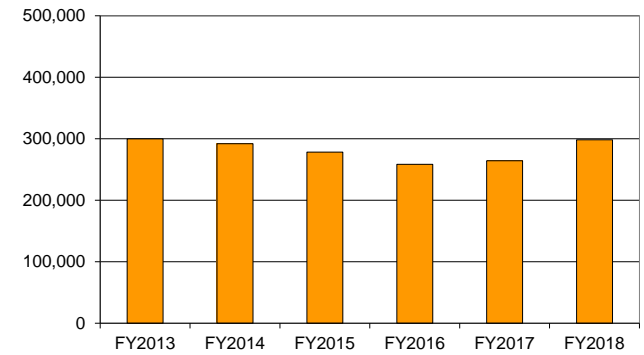
**Unlinked Passengers**



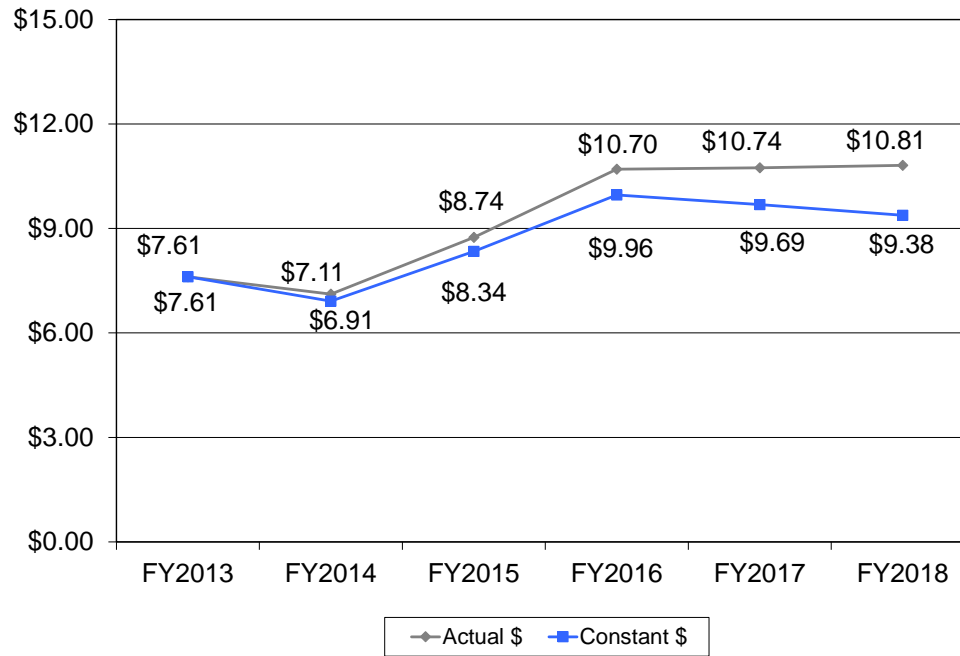
**Car Service Hours**



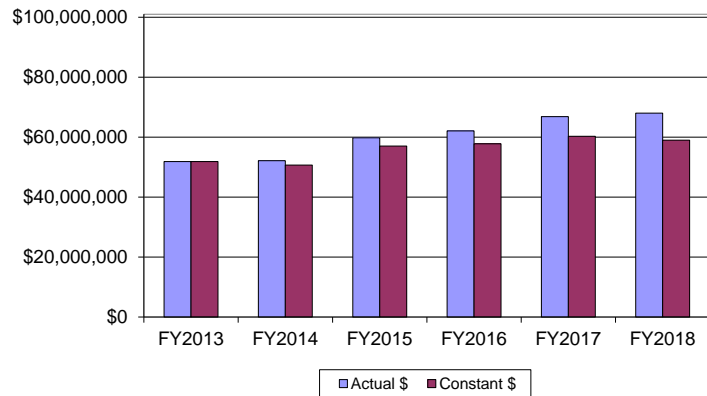
**Car Service Miles**



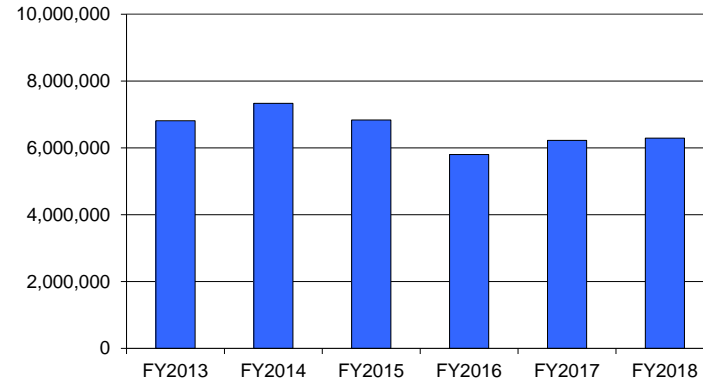
### Exhibit 7.3: Operating Cost per Passenger – Cable Car



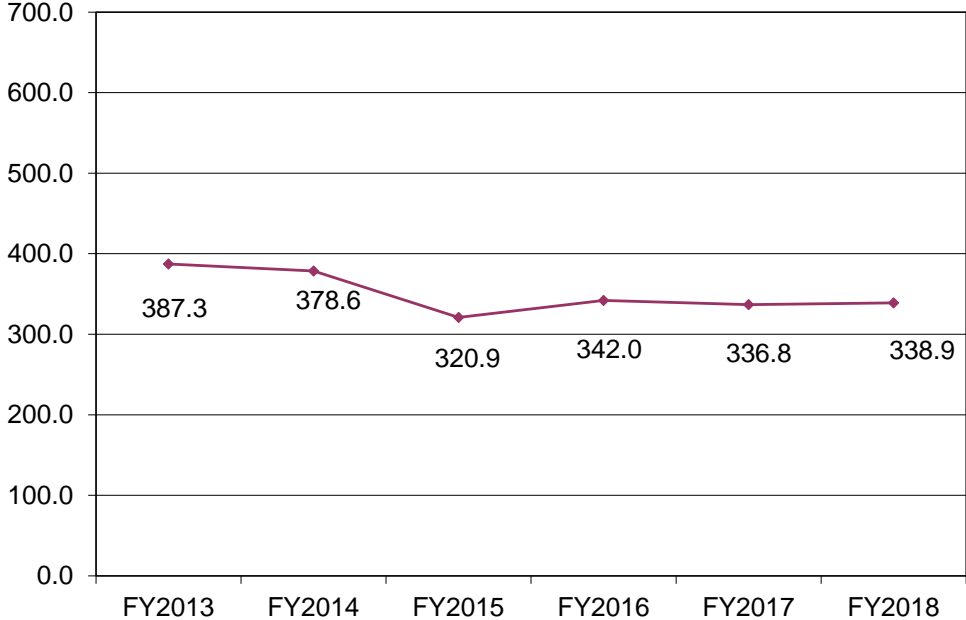
#### Operating Cost



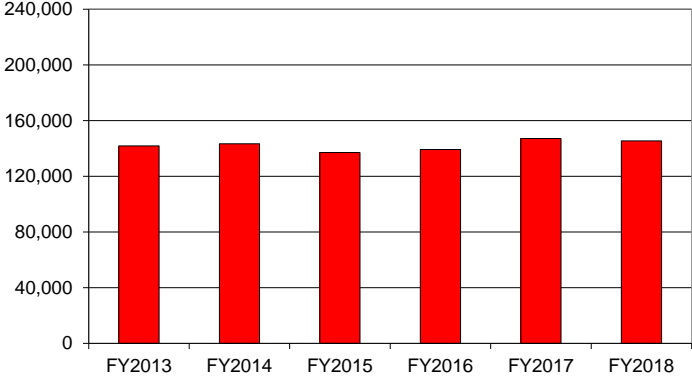
#### Unlinked Passengers



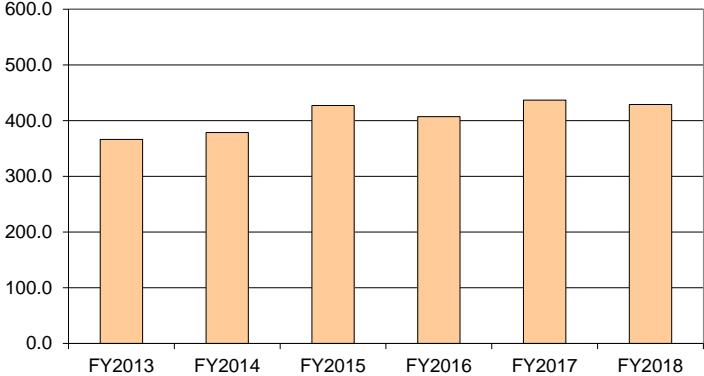
**Exhibit 7.4: Car Service Hours per FTE – Cable Car**



**Car Service Hours**



**Full-time Equivalent**



## Cable Car Component Costs

The year-to-year changes in selected operating cost categories are presented in Exhibit 7.5, along with the concurrent changes in car service hours. The portions of the cost per car service hour that can be attributed to each included cost component are shown in Exhibit 7.6.

- Between FY2013 and FY2018, total operating costs increased by 5.6 percent annually.
- The most significant change was an average annual increase of 22.6 percent in the services area, mostly driven by major increases in FY2015 and FY2016.
- Also notable was an average annual increase of 12.8 percent in the casualty/liability area. In addition, a negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
- Labor costs represented the largest portion of the total costs, contributing about 50 percent throughout the review period.
- Fringe benefits comprised the second largest portion, with consistently just over 40 percent of total costs.
- Labor and fringe benefits costs both increased between five and six percent on average per year.
- Materials/supplies costs generally decreased over the period, by 5.3 percent per year on average.
- The “other expenses” category showed an increase of seven percent per year on average, but remained a small portion of total costs in absolute terms.

\* \* \* \* \*

The following is a brief summary of the component operating costs trend highlights between FY2013 and FY2018:

- The most significant changes were average annual increases of 23 percent in the services area and 13 percent in casualty/liability costs. In addition, a negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
- Labor costs represented the largest portion of the total costs, with a share of about 50 percent over the six years. Fringe benefits comprised the second largest portion, remaining at just over 40 percent during the review period. Labor and fringe benefits costs both increased between five and six percent on average per year.
- Materials/supplies costs generally decreased over the period, by 5.3 percent per year on average. At the same time, “other expenses” increased by about seven percent per year on average, but remained a very small portion of total costs.

### Exhibit 7.5: Component Cost Trends – Cable Car

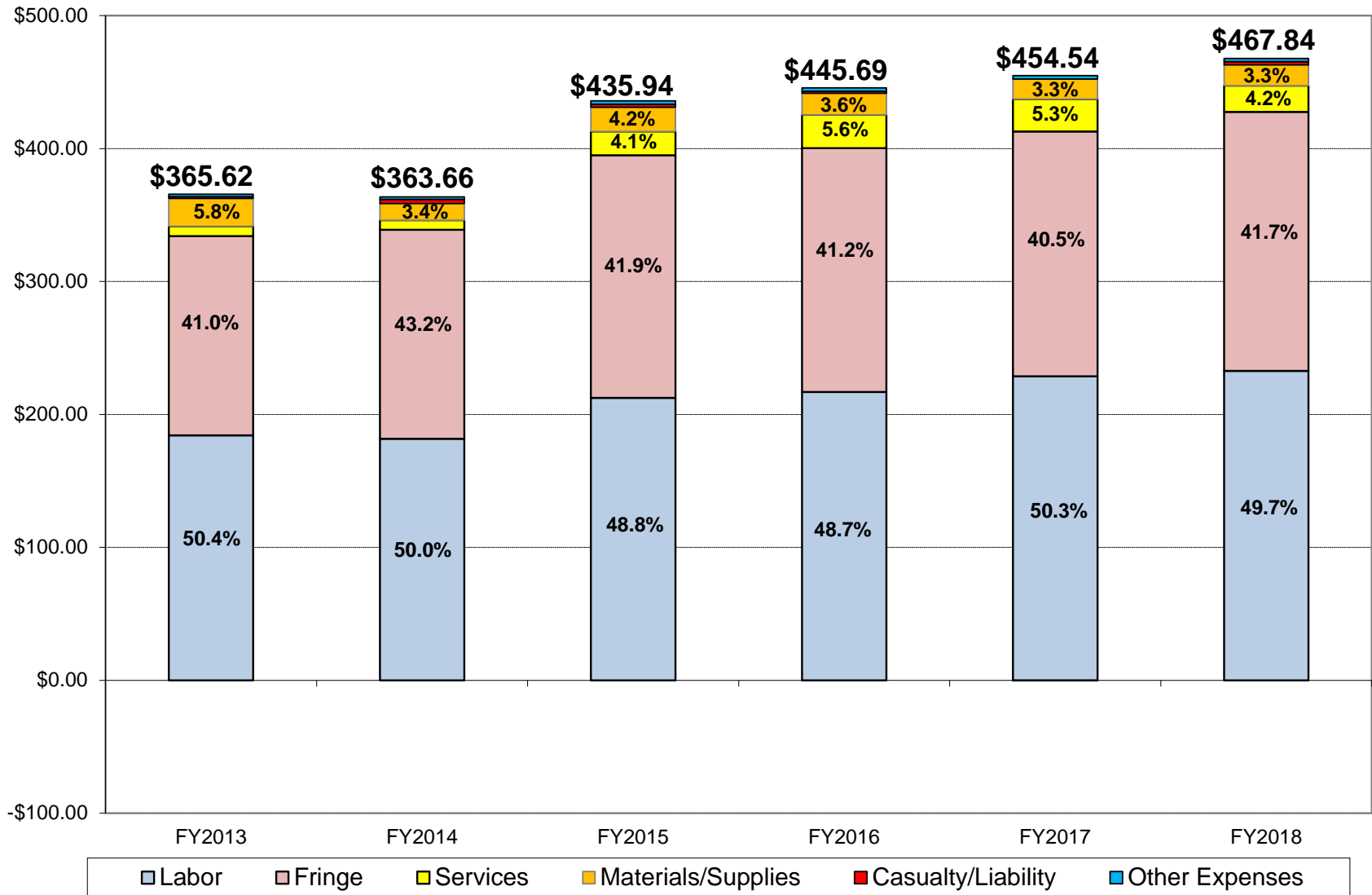
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Av. Ann. Chg.
COST CATEGORIES							
Labor (Salaries/Wages)	\$26,147,651	\$26,046,955	\$29,139,233	\$30,202,689	\$33,650,314	\$33,832,266	--
<i>Annual Change</i>	--	-0.4%	11.9%	3.6%	11.4%	0.5%	5.3%
Fringe Benefits	\$21,252,889	\$22,548,618	\$25,012,683	\$25,539,325	\$27,088,825	\$28,352,688	--
<i>Annual Change</i>	--	6.1%	10.9%	2.1%	6.1%	4.7%	5.9%
Services	\$1,037,328	\$1,041,396	\$2,434,388	\$3,496,123	\$3,568,210	\$2,870,198	--
<i>Annual Change</i>	--	0.4%	133.8%	43.6%	2.1%	-19.6%	22.6%
Materials/Supplies (a)	\$2,989,275	\$1,791,495	\$2,520,771	\$2,259,988	\$2,213,535	\$2,273,800	--
<i>Annual Change</i>	--	-40.1%	40.7%	-10.3%	-2.1%	2.7%	-5.3%
Casualty/Liability	\$182,636	\$449,591	\$287,606	\$196,519	-\$43,351	\$334,264	--
<i>Annual Change</i>	--	146.2%	-36.0%	-31.7%	-122.1%	--	12.8%
Other Expenses (b)	\$258,464	\$265,280	\$366,747	\$362,400	\$377,449	\$358,873	--
<i>Annual Change</i>	--	2.6%	38.2%	-1.2%	4.2%	-4.9%	6.8%
<b>Total</b>	\$51,868,243	\$52,143,335	\$59,761,428	\$62,057,044	\$66,854,982	\$68,022,089	--
<i>Annual Change</i>	--	0.5%	14.6%	3.8%	7.7%	1.7%	5.6%
OPERATING STATISTICS							
Car Service Hours	141,863	143,383	137,085	139,238	147,083	145,396	--
<i>Annual Change</i>	--	1.1%	-4.4%	1.6%	5.6%	-1.1%	0.5%

(a) Includes tires/tubes and other materials/supplies

(b) Includes utilities and miscellaneous expenses

Sources: FY2013 through FY2015 – Prior Performance Audit Report; FY2016 through FY2018 - NTD Reports

**Exhibit 7.6: Distribution of Component Costs – Cable Car**  
*Operating Cost per Car Service Hour*



## Paratransit Performance Trends

This section provides an overview of the performance of SFMTA's paratransit service. Only the demand response van components are covered in the analysis; the taxi operations have been excluded to conform with recent NTD reporting instructions to SFMTA. The analysis focuses on four of the five TDA performance indicators. Hours per FTE are not included in this analysis; FTE information was not available for the contracted service providers. The trends in the TDA indicators and input data are presented in Exhibit 8. The six-year trends are illustrated in Exhibits 8.1 through 8.3.

- Operating Cost per Vehicle Service Hour (Exhibit 8.1)
  - SFMTA's paratransit cost per hour increased from \$62.10 in FY2013 to \$82.15 in FY2018, or an average of 5.8 percent per year.
  - Operating expenses increased by ten percent per year overall, while vehicle service hours went up just four percent.
  - The largest annual increase (30 percent) occurred in FY2015. Operating costs increased by 27 percent that year, coinciding with the transition to a new service provider, even as service hours decreased moderately.
  - In constant FY2013 dollars, there was an average annual increase of 2.8 percent over the six years.
  
- Passengers per Vehicle Service Hour (Exhibit 8.2)
  - Passengers per vehicle service hour decreased in every year of the review period, overall down from 2.74 passengers in FY2013 to 1.72 in FY2018.
  - This trend amounted to an average annual decrease of 8.9 percent, as overall annual passenger levels decreased by 5.2 percent while corresponding service hours increased by 4.1 percent.



- The most significant single-year change was a drop of 27 percent in FY2014, from 2.74 passengers per hour to 2.00.
- Passengers per Vehicle Service Mile (Exhibit 8.2)
  - Performance declined overall from 0.34 passengers per mile in FY2013 to 0.24 in FY2018.
  - There were notable annual declines in FY2014 (25 percent) and FY2017 (12 percent), with smaller increases in the other years.
  - The net effect of these changes was an average annual decrease in this indicator of 6.6 percent.
- Operating Cost per Passenger (Exhibit 8.3)
  - Cost effectiveness declined significantly, with the cost per passenger rising by 16.1 percent per year on average, from \$22.63 in FY2013 to \$47.81 by FY2018.
  - The cost per passenger increased substantially in each year, as operating costs continued to climb but passenger levels steadily declined.
  - Operating costs increased by ten percent per year over the period, while passenger levels decreased by five percent per year.
  - With the impact of inflation removed, the result was still an average annual increase in the cost per passenger of 12.9 percent.

\* \* \* \* \*

The following is a brief summary of the TDA performance trend highlights over the six-year period of FY2013 through FY2018:

- There was an average annual increase in the operating cost per hour of 5.8 percent, or 2.8 percent in inflation adjusted dollars. Operating expenses

increased by ten percent per year overall, while vehicle service hours went up just four percent.

- The cost per passenger increased on average by 16.1 percent per year, which amounted to an average annual increase of 12.9 percent in constant FY2013 dollars. The cost per passenger increased substantially in each year, as operating costs continued to climb but passenger levels steadily declined.
- Passenger productivity also declined significantly over the period, with passengers per vehicle service hour decreasing by 8.9 percent per year overall, and passengers per vehicle service mile decreasing by 6.6 percent.

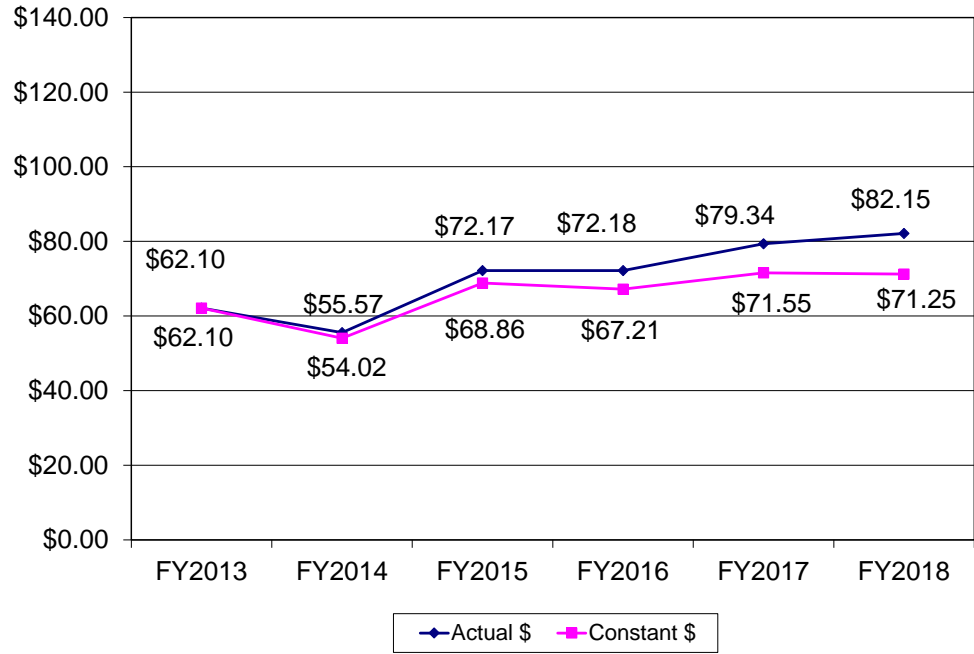
### Exhibit 8: TDA Indicator Performance – Paratransit

	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Av. Ann. Chg.
<b>Performance Indicators</b>							
Op. Cost per Vehicle Svc. Hour (Actual \$)	\$62.10	\$55.57	\$72.17	\$72.18	\$79.34	\$82.15	- -
<i>Annual Change</i>	- -	-10.5%	29.9%	0.0%	9.9%	3.5%	5.8%
Op. Cost per Vehicle Svc. Hour (Constant \$)	\$62.10	\$54.02	\$68.86	\$67.21	\$71.55	\$71.25	- -
<i>Annual Change</i>	- -	-13.0%	27.5%	-2.4%	6.5%	-0.4%	2.8%
Passengers per Vehicle Service Hour	2.74	2.00	1.96	1.84	1.83	1.72	- -
<i>Annual Change</i>	- -	-27.1%	-2.2%	-5.8%	-0.6%	-6.2%	-8.9%
Passengers per Vehicle Service Mile	0.344	0.259	0.270	0.275	0.242	0.244	- -
<i>Annual Change</i>	- -	-24.7%	4.4%	1.6%	-12.0%	1.0%	-6.6%
Op. Cost per Passenger (Actual \$)	\$22.63	\$27.77	\$36.88	\$39.17	\$43.32	\$47.81	- -
<i>Annual Change</i>	- -	22.8%	32.8%	6.2%	10.6%	10.4%	16.1%
Op. Cost per Passenger (Constant \$)	\$22.63	\$27.00	\$35.19	\$36.47	\$39.07	\$41.46	- -
<i>Annual Change</i>	- -	19.3%	30.3%	3.7%	7.1%	6.1%	12.9%
Vehicle Service Hours per FTE	(a)	(a)	(a)	(a)	(a)	(a)	- -
<i>Annual Change</i>	- -	- -	- -	- -	- -	- -	- -
<b>Input Data</b>							
Operating Cost (Actual \$)	\$13,181,343	\$14,164,223	\$17,962,926	\$18,772,080	\$20,609,984	\$21,304,500	- -
<i>Annual Change</i>	- -	7.5%	26.8%	4.5%	9.8%	3.4%	10.1%
Operating Cost (Constant \$)	\$13,181,343	\$13,769,894	\$17,139,019	\$17,480,055	\$18,586,824	\$18,478,766	- -
<i>Annual Change</i>	- -	4.5%	24.5%	2.0%	6.3%	-0.6%	7.0%
Vehicle Service Hours	212,250	254,895	248,901	260,072	259,756	259,338	- -
<i>Annual Change</i>	- -	20.1%	-2.4%	4.5%	-0.1%	-0.2%	4.1%
Vehicle Service Miles	1,694,622	1,969,621	1,802,314	1,745,564	1,968,208	1,826,069	- -
<i>Annual Change</i>	- -	16.2%	-8.5%	-3.1%	12.8%	-7.2%	1.5%
Unlinked Passengers	582,565	509,968	487,102	479,290	475,786	445,651	- -
<i>Annual Change</i>	- -	-12.5%	-4.5%	-1.6%	-0.7%	-6.3%	-5.2%
Employee Full-Time Equivalents	(a)	(a)	(a)	(a)	(a)	(a)	- -
<i>Annual Change</i>	- -	- -	- -	- -	- -	- -	- -
Bay Area CPI - Annual Change	- -	2.9%	1.9%	2.5%	3.3%	4.0%	- -
- Cumulative Change	- -	2.9%	4.8%	7.4%	10.9%	15.3%	2.9%

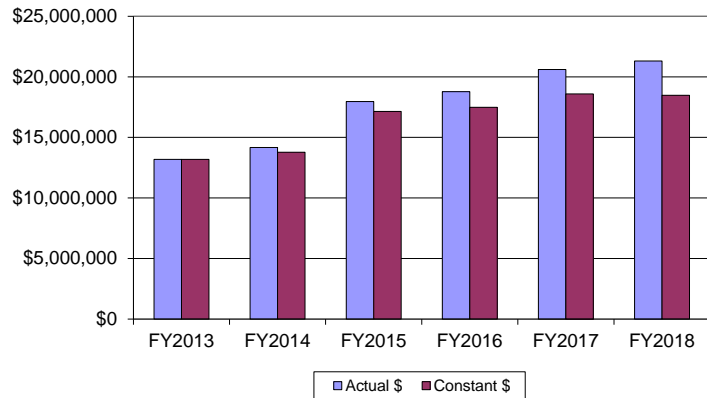
Sources: FY2013 through FY2015 - NTD Reports/Database (DR only)  
FY2016 through FY2018 - NTD Reports (FY2018 NTD is preliminary)  
CPI Data - U.S. Department of Labor, Bureau of Labor Statistics

(a) Not applicable as service is provided by private contractors

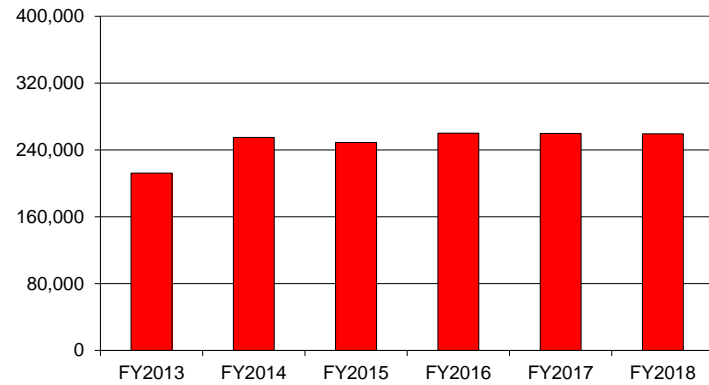
### Exhibit 8.1: Operating Cost per Vehicle Service Hour – Paratransit



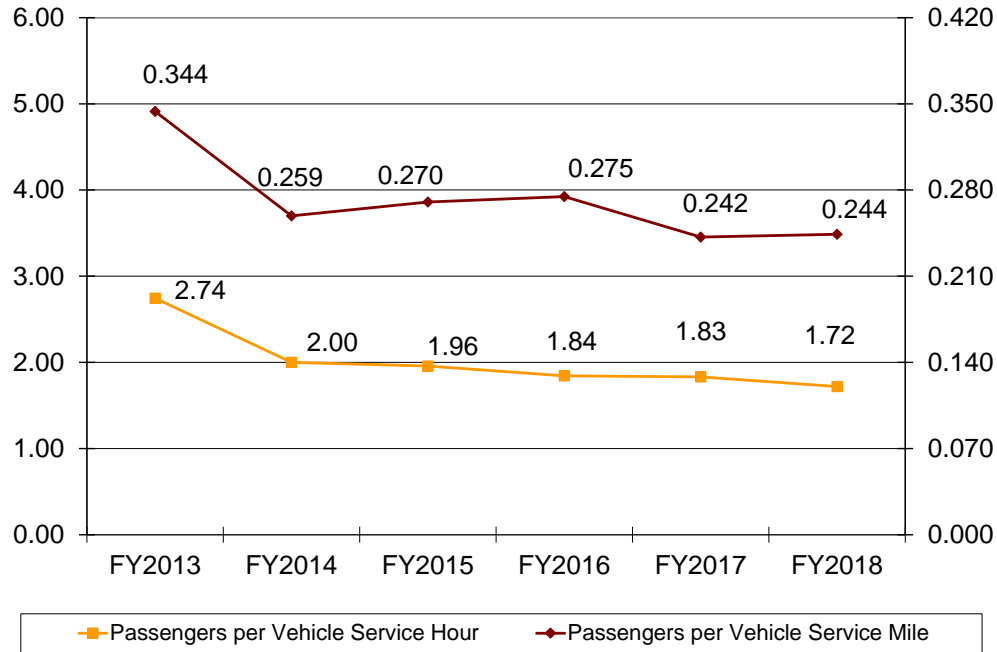
#### Operating Cost



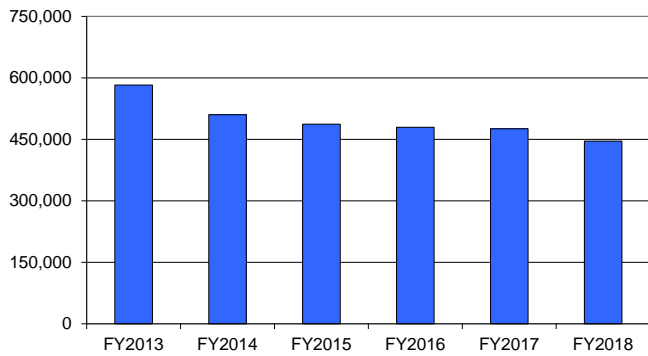
#### Vehicle Service Hours



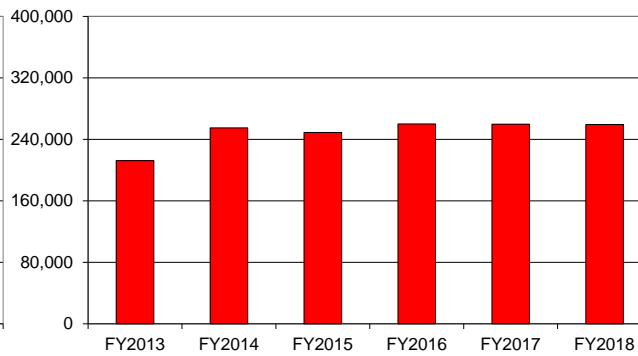
### Exhibit 8.2: TDA Indicator Performance – Paratransit Passengers per Hour and per Mile



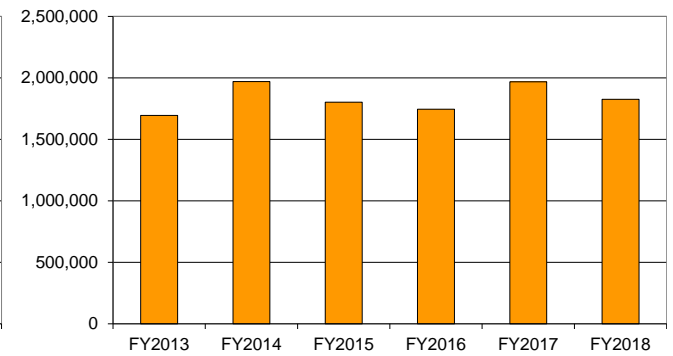
**Unlinked Passengers**



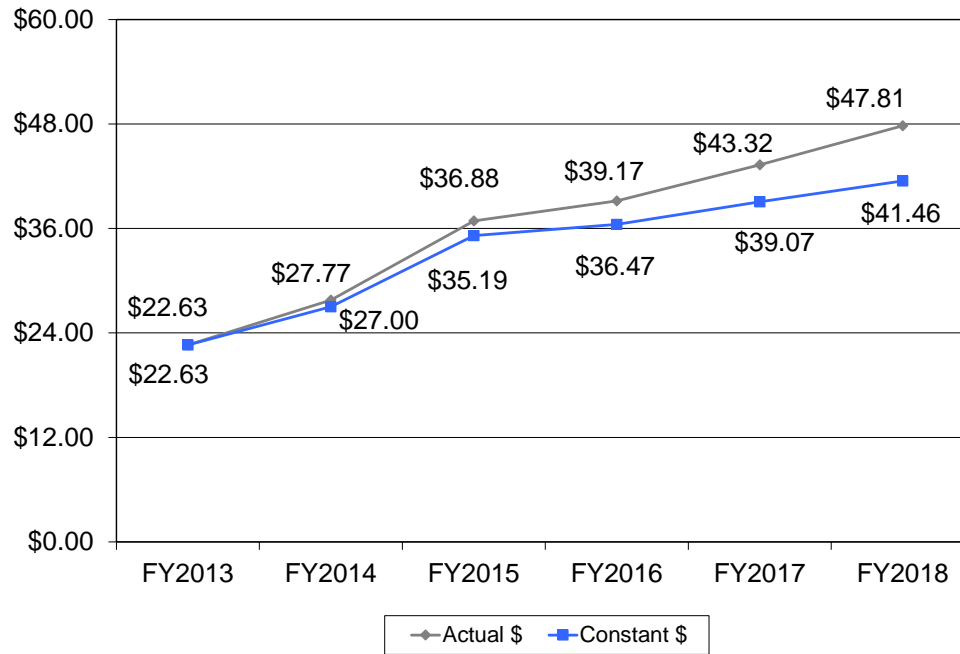
**Vehicle Service Hours**



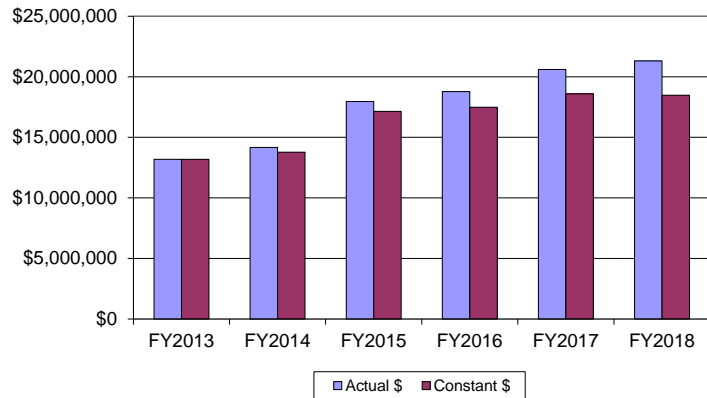
**Vehicle Service Miles**



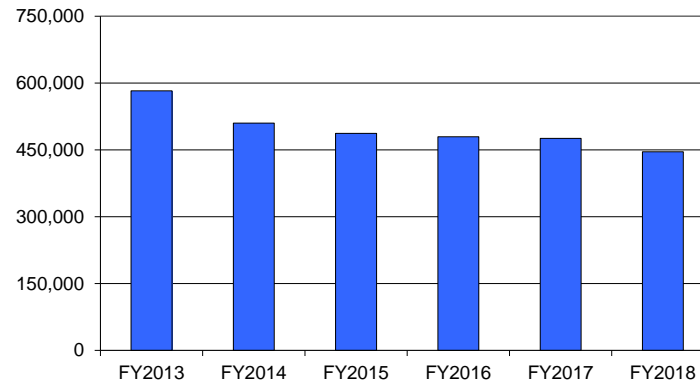
### Exhibit 8.3: Operating Cost per Passenger – Paratransit



### Operating Cost



### Unlinked Passengers



## Paratransit Component Costs

The year-to-year changes in selected operating cost categories are presented in Exhibit 8.4, along with the concurrent changes in vehicle service hours. The portions of the cost per vehicle service hour that can be attributed to each included cost component are shown in Exhibit 8.5.

- Between FY2013 and FY2018, the total annual costs increased by 10.1 percent on average. This was driven by a corresponding increase (9.9 percent) in purchased transportation costs, which is by far the largest component cost category.
- In-house labor and fringe benefits costs both increased about 15 percent on average per year.
- Costs in several other categories showed significant percent changes as well, but they continued to comprise a very small portion of the total costs.
- Purchased transportation costs continued to be the source of about 98 percent of all costs in all six years.
- No casualty/liability costs were reported in the first three years, and no services costs were reported in the last three years.
- A negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.

\* \* \* \* \*

The following is a brief summary of the component operating costs trend highlights between FY2013 and FY2018:

- Total annual costs increased by ten percent on average, driven by a corresponding increase in purchased transportation costs – by far the

largest component cost category. Purchased transportation costs continued to be the source of about 98 percent of all costs in all six years.

- In-house labor and fringe benefits costs both increased about 15 percent on average per year. Costs in several other categories showed significant percent changes as well, but they comprised a very small portion of the total costs.
- No casualty/liability costs were reported in the first three years, and no services costs were reported in the last three years. A negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.



### Exhibit 8.4: Component Costs Trends – Paratransit

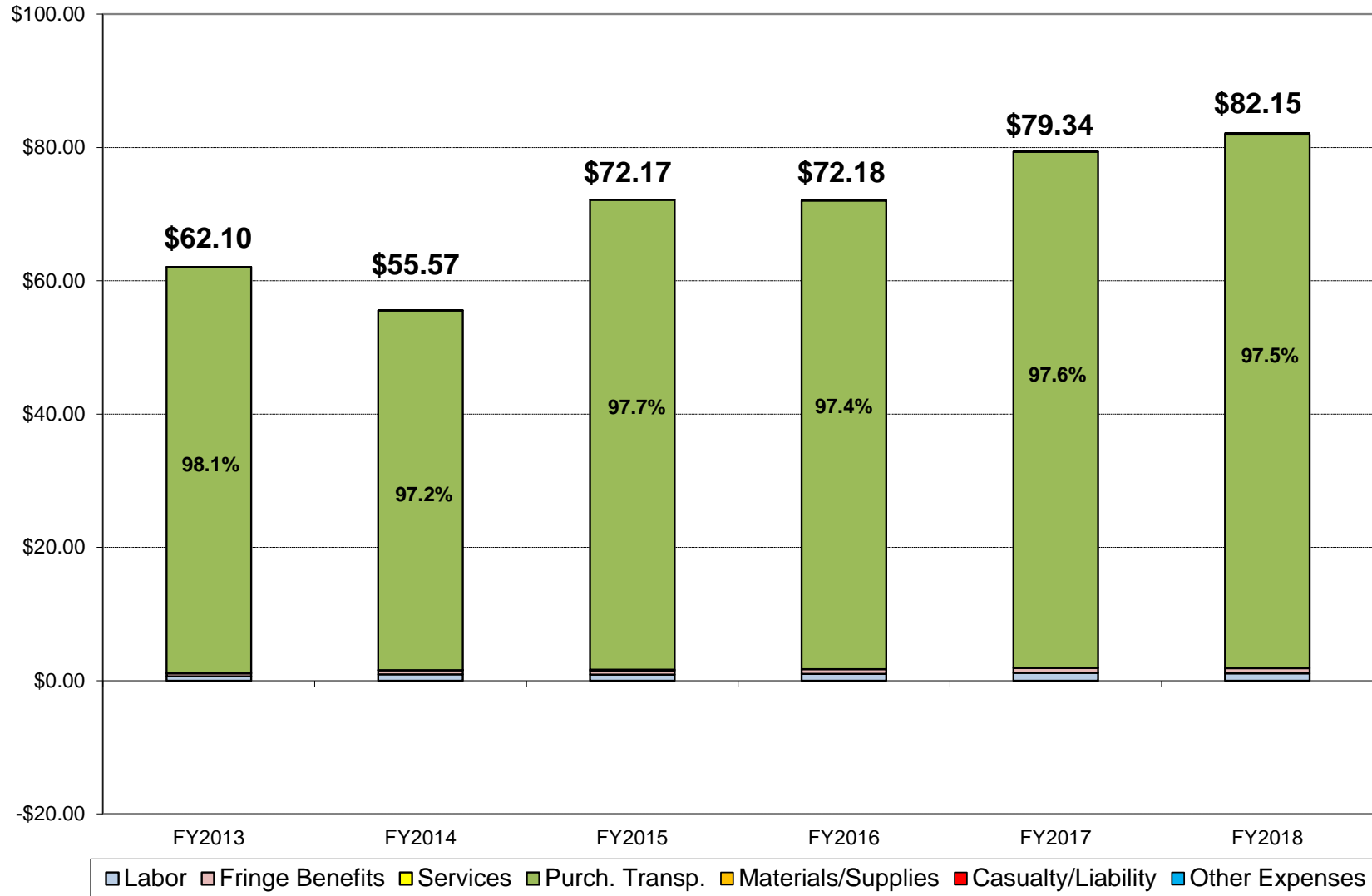
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Av. Ann. Chg.
COST CATEGORIES							
Labor (Salaries/Wages)	\$139,326	\$235,649	\$228,170	\$267,592	\$299,354	\$278,637	--
<i>Annual Change</i>	--	69.1%	-3.2%	17.3%	11.9%	-6.9%	14.9%
Fringe Benefits	\$94,952	\$162,246	\$143,858	\$181,170	\$194,964	\$205,051	--
<i>Annual Change</i>	--	70.9%	-11.3%	25.9%	7.6%	5.2%	16.6%
Services	\$6,683	\$66	\$39,570	\$0	\$0	\$0	--
<i>Annual Change</i>	--	-99.0%	59854.5%	-100.0%	--	--	-100.0%
Purchased Transportation	\$12,933,790	\$13,762,582	\$17,543,804	\$18,288,834	\$20,117,706	\$20,768,627	--
<i>Annual Change</i>	--	6.4%	27.5%	4.2%	10.0%	3.2%	9.9%
Materials/Supplies (a)	\$301	\$1,933	\$5,262	\$821	\$845	\$2,064	--
<i>Annual Change</i>	--	542.2%	172.2%	-84.4%	2.9%	144.3%	47.0%
Casualty/Liability	\$0	\$0	\$0	\$30,996	-\$7,284	\$48,354	--
<i>Annual Change</i>	--	--	--	--	-123.5%	-763.8%	--
Other Expenses (b)	\$6,291	\$1,747	\$2,262	\$2,667	\$4,399	\$1,767	--
<i>Annual Change</i>	--	-72.2%	29.5%	17.9%	64.9%	-59.8%	-22.4%
<b>Total</b>	\$13,181,343	\$14,164,223	\$17,962,926	\$18,772,080	\$20,609,984	\$21,304,500	--
<i>Annual Change</i>	--	7.5%	26.8%	4.5%	9.8%	3.4%	10.1%
OPERATING STATISTICS							
Vehicle Service Hours	212,250	254,895	248,901	260,072	259,756	259,338	--
<i>Annual Change</i>	--	20.1%	-2.4%	4.5%	-0.1%	-0.2%	4.1%

(a) Includes fuel/lubricants, tires/tubes and other materials/supplies

(b) Includes utilities and miscellaneous expenses

Sources: FY2013 through FY2015 – Prior Performance Audit Report (Taxi removed); FY2016 through FY2018 - NTD Reports

**Exhibit 8.5: Distribution of Component Costs – Paratransit**  
*Operating Cost per Vehicle Service Hour*



## IV. COMPLIANCE WITH PUC REQUIREMENTS

An assessment of SFMTA's compliance with selected sections of the state Public Utilities Code (PUC) has been performed. The compliance areas included in this review are those that MTC has identified for inclusion in the triennial performance audit. Other statutory and regulatory compliance requirements are reviewed by MTC in conjunction with its annual review of SFMTA's TDA-STA claim application.

The results from this review are detailed by individual requirement in Exhibit 9. SFMTA is in compliance with all seven sections of the state PUC that were reviewed as part of this performance audit. These sections included requirements concerning CHP terminal safety inspections, labor contracts, reduced fares, Welfare-to-Work, revenue sharing, and evaluating passenger needs.

## Exhibit 9: Compliance with State PUC Requirements

Code Reference	Operator Compliance Requirements	Compliance Finding	Verification Information
PUC99251	<u>CHP Certification</u> - The CHP has, within the 13 months prior to each TDA claim submitted by an operator, certified the operator's compliance with Vehicle Code Section 1808 following a CHP inspection of the operator's terminal	In Compliance	Satisfactory Inspections (by facility): <ul style="list-style-type: none"> <li>• Flynn: 02/16, 02/17, 03/18</li> <li>• Kirkland: 10/15, 10/16, 11/17</li> <li>• Woods: 10/15, 10/16, 10/17</li> <li>• Islais Creek (new facility): 09/18</li> </ul>
PUC99264	<u>Operator-to-Vehicle Staffing</u> - The operator does not routinely staff with two or more persons public transportation vehicles designed to be operated by one person	In Compliance	No provision for excess staffing in Collective Bargaining Agreement with Transport Workers Union, Local 250-A (9163), July 2014-June 2019.
PUC99314.5(e) (1)(2)	<u>Part-Time Drivers and Contracting</u> - If the operator receives STA funds, the operator is not precluded by contract from employing part-time drivers or from contracting with common carriers.	In Compliance	Part-time drivers are employed by SFMTA per in Article 11 of Collective Bargaining Agreement with Transport Workers Union, Local 250-A (9163), July 2014-June 2019.  SFMTA contracts with various carriers for its paratransit service provision, through its paratransit broker Transdev Services, Inc.
PUC99155	<u>Reduced Fare Eligibility</u> - For any operator who received TDA Article 4 funds, if the operator offers reduced fares to senior citizens and disabled persons, applicant will honor the federal Medicare identification card, the California Department of Motor Vehicles disability ID card, the Regional Transit Connection Discount Card, or any other current identification card issued by another transit operator that is valid for the type of transportation service or discount requested; and if the operator offers reduced fares to senior citizens, it also offers the same reduced fare to disabled patrons	In Compliance	Fare information in public information materials on SFMTA website.  SFMTA Fare Policy Document, July 2018 (Resolution No. 180717-107).

Code Reference	Operator Compliance Requirements	Compliance Finding	Verification Information
PUC99155.1(a) (1)(2)	<u>Welfare-to-Work</u> - The operator coordinates with county welfare departments in order to ensure that transportation moneys available for purposes of assisting recipients of aid are expended efficiently for the benefit of that population; if a recipient of CalWORKs program funds by the county, the operator shall give priority to the enhancement of public transportation services for welfare-to-work purposes and to the enhancement of transportation alternatives, such as, but not limited to, subsidies or vouchers, van pools, and contract paratransit operations, in order to promote welfare-to-work purposes.	In Compliance	SFMTA is a stakeholder in the MTC Coordinated Public Transit-Human Services Transportation Plan for the San Francisco Bay Area, directed by MTC as the RTAP and MPO for the Bay Area. The most recent Coordination Plan update was completed in February 2018.
PUC99314.7, Govt Code 66516, MTC Res. Nos. 3837, 4073	<u>Joint Revenue Sharing Agreement</u> - The operator has current joint fare revenue sharing agreements in place with transit operators in the MTC region with which its service connects, and submitted copies of agreements to MTC	In Compliance	2016 Amended and Restated Clipper® Memorandum of Understanding by and among MTC and the transit operators participating in the Clipper® program. (SFMTA participates with connecting operators.)  Additional agreements between SFMTA and BART also remain in effect: <ul style="list-style-type: none"> <li>• 1994 Daly City Transfer Agreement</li> <li>• 2014 Fast Pass Agreement</li> </ul>
PUC99246(d)	<u>Process for Evaluation of Passenger Needs</u> - The operator has an established process in place for evaluating the needs and types of passengers being served	In Compliance	<ul style="list-style-type: none"> <li>• Short Range Transit Plan (SRTP) -- most recent FY2017-FY2030, adopted June 2017: includes evaluations of existing service and facility conditions, demographic analysis, service alternatives, marketing and outreach plans, operating and capital plans and recommendations.</li> </ul>

Code Reference	Operator Compliance Requirements	Compliance Finding	Verification Information
			<ul style="list-style-type: none"> <li>• “Muni Forward” program website – describes various transit route changes and service improvement projects underway or planned, largely as informed by the earlier Transit Effectiveness Project (TEP).</li> <li>• 2016, 2017 and 2018 Ridership Survey Reports</li> </ul>

## V. STATUS OF PRIOR AUDIT RECOMMENDATIONS

SFMTA's prior performance audit was completed in June 2016. Generally, MTC has used the audit recommendations as the basis for developing the Productivity Improvement Program (PIP) projects the operator is required to complete. MTC tracks PIP project implementation as part of its annual review of the operator's TDA-STA claim application. This section provides an assessment of actions taken by TDA-STA recipients toward implementing the recommendations advanced in the prior audit. This assessment provides continuity between the current and prior audits, which allows MTC to fulfill its obligations where the recommendations were advanced as PIP projects.

This review addresses SFMTA's responses to the recommendations made in the prior performance audit, and whether SFMTA made reasonable progress toward their implementation. There were two recommendations made in SFMTA's prior audit. A summary of the recommendations and the actions taken by SFMTA in response is presented in Exhibit 10. A determination of the status of the recommendation also is provided, using one of the following four evaluation categories:

- Implemented – appropriate actions have been taken and the issue has been sufficiently addressed.
- Implementation in Progress – actions have been taken to address the issue, but the recommendation remains open until further actions are completed.
- Not Implemented – no actions have been taken to address the issue, and the recommendation remains open.
- Closed – no actions have been taken to address the issue, but changes in circumstances have impacted the need to implement the recommendation.

One of the two recommendations has been implemented. Through the current audit period and beyond, SFMTA Paratransit has been using automatically generated data to report all SF Access and Intercounty trips while using a limited manual validation for all electronically reported Group Van trips. It appears that the previous reporting discrepancies have been eliminated and paratransit passenger trip data is now consistent and accurate across all reporting systems.

Implementation is in progress for the remaining recommendation. Efforts are continuing toward obtaining accurate results from SFMTA's automatic passenger counters. SFMTA is in the process of moving from its original autonomous APC data collection system to an APC system developed by Conduent, Inc., and is working on a suite of analytical tools to monitor the APC system data and identify glitches and speed up remedies. Further, SFMTA is nearing completion of a major APC validation effort that compares APC counts with manual counts.



### Exhibit 10: Status of Prior Audit Recommendations

Recommendation	Actions Taken	Evaluation
<p>1. Continue efforts toward obtaining accurate results from SFMTA’s automatic passenger counters.</p>	<p>SFMTA reports being in the process of moving from its original autonomous APC data collection system to an APC system developed by Conduent, Inc. that is integrated with Harris Radio. Currently, data from both systems is being used together in reporting ridership to the NTD for rubber tired vehicles. SFMTA analysts are working on a suite of analytical tools to monitor the APC system data and identify glitches and speed up remedies.</p> <p>SFMTA is also nearing completion of a major APC validation effort that compares APC counts with manual counts. The 200 manual ridechecks performed as part of the validation effort will help staff to reassess the accuracy of its multiple door sensors and provide information to help decide whether or not to apply load balancing algorithms to the raw APC data generated by the new system.</p>	<p>Implementation in Progress</p>

Recommendation	Actions Taken	Evaluation
<p>2. Ensure that paratransit passenger trip data is consistent and accurate across all reporting systems.</p>	<p>Paratransit passenger trip data reported to the NTD had not been validated as was the passenger trip data reported with the monthly Paratransit Contractor invoices. Prior audit period NTD data showed declines in ridership, while the more carefully validated monthly report data showed relatively flat ridership. The contractor was using Trapeze and DCCS software to automatically generate the annual trip counts, and reported those figures directly to the NTD without validation.</p> <p>SFMTA indicated that going forward, the contractor would no longer be using any manually generated data, nor automatically generated end-of-year trip counts for NTD reporting. The contractor would be summing the monthly trip counts that have gone through the validation process, and would be implementing procedural changes so that the automatically generated reports do not require an extensive validation process. SFMTA staff would be monitoring these procedural changes as well.</p> <p>Through the current audit period and beyond, SFMTA Paratransit has been using automatically generated data to report all SF Access and Intercounty trips while using a limited manual validation for all electronically reported Group Van trips. It appears that the previous reporting discrepancies have been eliminated.</p>	<p>Implemented</p>

## VI. FUNCTIONAL PERFORMANCE INDICATOR TRENDS

To further assess SFMTA's performance over the past three years, a detailed set of functional area performance indicators was defined. This assessment consists of a three-year trend analysis of the functions in each of the following areas:

- Management, Administration and Marketing
- Service Planning
- Operations
- Maintenance
- Safety

The indicators selected for this analysis were primarily those that were tracked regularly by SFMTA or for which input data were maintained by SFMTA on an on-going basis, such as performance reports, contractor reports, annual financial reports and NTD reports. As such, there may be some overlap with the TDA indicators examined earlier in the audit process, but most indicators will be different. Some indicators were selected from the California Department of Transportation's Performance Audit Guidebook for Transit Operators and Regional Transportation Planning Entities as being appropriate for this evaluation. The input statistics for the indicators, along with their sources, are contained in Appendix A at the end of this report.

The trends in performance are presented over the three-year audit period to give an indication of which direction performance is moving for these indicators. The remainder of this section presents the findings from this review. The discussion presents

the highlights of performance systemwide or by mode, each followed by an exhibit illustrating the indicators by function as applicable.

### Systemwide

For the purposes of this review, SFMTA's functional indicators relating to Management, Administration and Marketing have been included generally on a systemwide basis. Systemwide audit period performance is discussed below and presented in Exhibit 11.

- Administrative costs remained in a range of 18 to 20 percent of total operating costs in FY2013 to 20 percent or higher
- Administrative costs increased overall from \$41 to \$45 per vehicle service hour.
- The portion of administrative costs attributed to marketing activities (principally advertising) increased overall, from 0.6 to 0.7 percent.
- In terms of passenger trips, marketing costs amounted to \$0.39 in FY2015 but increased to \$0.50 or higher subsequently.
- The systemwide farebox recovery ratio declined in each year, from 25.7 percent in FY2016 to 23.7 percent by FY2018.

\* \* \* \* \*

The following is a brief summary of the systemwide functional trend highlights between FY2016 and FY2018:

- Administrative costs comprised between 18 and 20 percent of total operating costs, and increased from \$41 to \$45 per vehicle service hour.

- Marketing costs increased compared to total administrative costs and also relative to passenger trips.
- The systemwide farebox recovery ratio declined steadily from 25.7 percent to 23.7 percent.

### Exhibit 11: Functional Performance Trends – Systemwide (All Modes)

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
<b>MANAGEMENT, ADMINISTRATION &amp; MARKETING</b>			
Administrative Cost/Total Operating Cost	18.8%	17.7%	19.8%
<i>Annual Percent Change</i>	--	-5.7%	11.5%
<i>Three Year Percent Change</i>	--	--	5.2%
Administrative Cost/Vehicle Service Hour	\$41.07	\$37.43	\$44.95
<i>Annual Percent Change</i>	--	-8.9%	20.1%
<i>Three Year Percent Change</i>	--	--	9.5%
Marketing Cost/Total Administrative Cost	0.06%	0.10%	0.07%
<i>Annual Percent Change</i>	--	69.4%	-35.2%
<i>Three Year Percent Change</i>	--	--	9.7%
Marketing Cost/1,000 Unlinked Passenger Trips	\$0.39	\$0.66	\$0.50
<i>Annual Percent Change</i>	--	67.7%	-23.9%
<i>Three Year Percent Change</i>	--	--	27.6%
Farebox Revenue/Operating Cost	25.7%	24.0%	23.7%
<i>Annual Percent Change</i>	--	-6.5%	-1.4%
<i>Three Year Percent Change</i>	--	--	-7.8%

## Motor Coach

SFMTA's motor coach functional area trends represent areas of cost efficiency, safety, productivity and service reliability. Audit period performance is discussed below and presented in Exhibit 12.

- Service Planning
  - Operating costs per passenger mile increased from \$1.35 in the first year to \$1.55 in FY2018 (15 percent).
  - The portion of vehicle miles traveled that were in service remained at about 88 percent. Similarly, the portion of vehicle hours in service remained at about 92 percent.
  - The motor coach farebox recovery ratio increased overall from 25.4 percent in FY2016 to 26.3 percent by FY2018.
  
- Operations
  - Vehicle operations costs increased from 55 percent of total operating costs in FY2016 to 57 percent in FY2018.
  - Vehicle operations costs per service hour increased overall from \$102.34 to \$104.48, though the result was lower in the middle year (FY2017).
  - Operator scheduled absences remained at about ten percent of total hours worked, while unscheduled absences were steady at about 4.5 percent.
  - Schedule adherence declined somewhat from 61 percent in FY2016 to 57 percent by FY2018.
  - The rate of motor coach related complaints was reduced in each year, from 7.0 to 5.2 per 100,000 passengers.

- The incidence of missed trips increased in each year, from 0.4 percent in FY2016 to 2.8 percent by FY2018.

- Maintenance

- Total maintenance costs (vehicle plus non-vehicle) were reduced from 25 percent to 21 percent of total operating costs in FY2018.
- Vehicle maintenance costs per service mile decreased over the audit period from \$4.97 in FY2016 to \$4.23 in the last year, 15 percent overall.
- Mechanic pay hours decreased from 20 percent of vehicle service hours in the first year to 17.5 percent subsequently.
- Maintenance employee scheduled and unscheduled absences remained at about 12 percent and five percent of total hours worked, respectively.
- The vehicle spare ratio increased in each year, from about 19 percent in FY2016 to 25 percent in FY2018.
- The mean distance between major failures improved overall by 12 percent during the period. When looking at all failures, the rate of improvement was 16 percent.

- Safety

- The rate of preventable accidents increased from 2.6 per 100,000 miles traveled in the first year to 2.8 in FY2018.
- Casualty/liability costs per service per service hour and mile both jumped by more than 40 percent between FY2016 and FY2018. A negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
- There were more than 20,000 work hours lost due to industrial accidents in both FY2016 and FY2017, reduced to about 17,000 in FY2018.



\* \* \* \* \*

The following is a brief summary of the motor coach functional trend highlights between FY2016 and FY2018:

- Service Planning results showed a 15 percent increase in the cost per passenger mile, steady performance in the portions of vehicle miles and hours in service, and the farebox recovery ratio increasing overall to 26.3 percent by FY2018.
- Operations results showed some increase in operating costs incurred from vehicle operations, and a net increase in vehicle operations costs per hour. Operator scheduled absences were steady at about ten percent of total hours worked, while unscheduled absences remained at about 4.5 percent. Schedule adherence went down from 61 to 57 percent, while missed trips were up to 2.8 percent in FY2018. At the same time, the rate of complaints was reduced.
- Maintenance results showed a reduction in total maintenance costs to 21 percent of the total operating costs, vehicle maintenance costs per mile decreasing by 18 percent, the vehicle spare ratio increasing steadily to 25 percent in FY2018, and improvement in the mechanical failure rates. In addition, mechanic pay hours decreased compared to vehicle service hours, while maintenance employee scheduled and unscheduled absences remained near 12 percent and five percent of total work hours.
- Safety results showed the preventable accident rate increasing slightly, casualty/liability costs per service hour and mile both increasing by more than 40 percent overall, and some reduction in lost time due to industrial accidents in FY2018.

## Exhibit 12: Functional Performance Trends – Motor Coach

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
<b>SERVICE PLANNING</b>			
Total Operating Cost/Passenger Mile	\$1.35	\$1.42	\$1.55
<i>Annual Percent Change</i>	--	5.2%	9.2%
<i>Three Year Percent Change</i>	--	--	14.9%
Vehicle Service Miles/Total Miles	87.7%	88.1%	88.0%
<i>Annual Percent Change</i>	--	0.4%	-0.1%
<i>Three Year Percent Change</i>	--	--	0.3%
Vehicle Service Hours/Total Hours	92.1%	92.5%	92.4%
<i>Annual Percent Change</i>	--	0.5%	-0.2%
<i>Three Year Percent Change</i>	--	--	0.3%
Farebox Revenue/Operating Cost	25.4%	25.2%	26.3%
<i>Annual Percent Change</i>	--	-1.0%	4.5%
<i>Three Year Percent Change</i>	--	--	3.4%
<b>OPERATIONS</b>			
Vehicle Operations Cost/Total Operating Cost	54.9%	56.1%	57.2%
<i>Annual Percent Change</i>	--	2.3%	1.8%
<i>Three Year Percent Change</i>	--	--	4.2%
Vehicle Operations Cost/Vehicle Service Hour	\$102.34	\$96.75	\$104.48
<i>Annual Percent Change</i>	--	-5.5%	8.0%
<i>Three Year Percent Change</i>	--	--	2.1%
Operator Sched. Absences/Total Hours Worked	10.0%	10.5%	9.9%
<i>Annual Percent Change</i>	--	4.7%	-5.3%
<i>Three Year Percent Change</i>	--	--	-0.8%
Operator Unsched. Absences/Total Hours Worked	4.6%	4.6%	4.5%
<i>Annual Percent Change</i>	--	0.0%	-3.8%
<i>Three Year Percent Change</i>	--	--	-3.8%
Trips On-Time	61%	60%	57%
<i>Annual Percent Change</i>	--	-1.6%	-5.0%
<i>Three Year Percent Change</i>	--	--	-6.6%
Complaints/100,000 Unlinked Passenger Trips	7.0	6.2	5.2
<i>Annual Percent Change</i>	--	-10.7%	-17.0%
<i>Three Year Percent Change</i>	--	--	-25.9%
Missed Trips	0.44%	0.93%	2.83%
<i>Annual Percent Change</i>	--	111.4%	204.3%
<i>Three Year Percent Change</i>	--	--	543.2%

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
<b>MAINTENANCE</b>			
Vehicle + Non-Veh. Maint. Cost/Total Operating Cost	24.7%	25.5%	21.1%
<i>Annual Percent Change</i>	--	3.0%	-17.1%
<i>Three Year Percent Change</i>	--	--	-14.7%
Vehicle Maintenance Cost/Vehicle Service Mile	\$4.97	\$4.69	\$4.23
<i>Annual Percent Change</i>	--	-5.7%	-9.8%
<i>Three Year Percent Change</i>	--	--	-15.0%
Mechanic Pay Hours/Vehicle Service Hours	20.0%	17.4%	17.5%
<i>Annual Percent Change</i>	--	-13.0%	0.7%
<i>Three Year Percent Change</i>	--	--	-12.4%
Maintenance Employee Scheduled Absences	12.2%	12.7%	11.8%
<i>Annual Percent Change</i>	--	4.0%	-6.6%
<i>Three Year Percent Change</i>	--	--	-2.9%
Maintenance Employee Unscheduled Absences	5.3%	5.8%	4.8%
<i>Annual Percent Change</i>	--	8.8%	-16.8%
<i>Three Year Percent Change</i>	--	--	-9.5%
Spare Vehicles/Total Vehicles	18.7%	22.8%	24.7%
<i>Annual Percent Change</i>	--	22.2%	8.4%
<i>Three Year Percent Change</i>	--	--	32.5%
Mean Distance between Major Failures (Miles)	7,492	8,756	8,372
<i>Annual Percent Change</i>	--	16.9%	-4.4%
<i>Three Year Percent Change</i>	--	--	11.7%
Mean Distance between All Failures (Miles)	6,970	7,091	8,083
<i>Annual Percent Change</i>	--	1.7%	14.0%
<i>Three Year Percent Change</i>	--	--	16.0%
<b>SAFETY</b>			
Preventable Accidents/100,000 Vehicle Miles	2.61	2.70	2.76
<i>Annual Percent Change</i>	--	3.3%	2.1%
<i>Three Year Percent Change</i>	--	--	5.4%
Casualty & Liability Cost/Vehicle Service Hour	\$6.26	-\$1.28	\$8.77
<i>Annual Percent Change</i>	--	-120.4%	--
<i>Three Year Percent Change</i>	--	--	40.2%
Casualty & Liability Cost/Vehicle Service Mile	\$0.77	-\$0.16	\$1.12
<i>Annual Percent Change</i>	--	-121.1%	--
<i>Three Year Percent Change</i>	--	--	44.7%
Work Hours Lost Due to Industrial Accidents	20,655	22,301	17,831
<i>Annual Percent Change</i>	--	8.0%	-20.0%
<i>Three Year Percent Change</i>	--	--	-13.7%

## Trolley Coach

SFMTA's trolley coach functional area performance trends for the audit period are discussed below and presented in Exhibit 13.

- Service Planning
  - Operating costs per passenger mile increased from \$1.80 in the first year to \$2.62 in FY2018 (45 percent).
  - The portion of vehicle miles traveled that were in service remained at about 95 percent. Similarly, the portion of vehicle hours in service remained at about 96 percent.
  - The trolley coach farebox recovery ratio declined overall from 28.9 percent in FY2016 to 22.5 percent by FY2018.
  
- Operations
  - Vehicle operations costs increased from 52 percent of total operating costs in FY2016 to 55 percent in the last year.
  - Vehicle operations costs per service hour increased steadily from \$92.31 to \$113.22 (22.6 percent).
  - Operator scheduled absences remained at about ten percent of total hours worked, while unscheduled absences decreased from 4.9 to 4.1 percent over the period.
  - Schedule adherence declined somewhat from 65 percent in FY2016 to 62 percent by FY2018.
  - The rate of trolley coach related complaints was just below six per 100,000 passengers in both FY2016 and FY2018, with slightly higher results in the interim year.
  - The incidence of missed trips increased in each year, from 0.4 percent in FY2016 to 2.0 percent by FY2018.

- Maintenance
  - Total maintenance costs (vehicle plus non-vehicle) decreased from about 29 percent of total operating costs in the first two years to 24 percent in FY2018.
  - Vehicle maintenance costs per service mile increased overall from \$5.04 in FY2016 to \$5.16 two years later (2.5 percent), with moderately higher results in the middle year.
  - Mechanic pay hours increased from 16.8 percent of vehicle service hours in the first year to more than 18 percent subsequently.
  - Maintenance employee scheduled and unscheduled absences remained at about 11 percent and four percent of total hours worked, respectively.
  - The vehicle spare ratio dropped from 40 percent to 25 percent in FY2017, and then rose again to 37 percent in FY2018.
  - The mean distance between major failures improved in each year, overall by 45 percent during the period. When looking at all failures, the rate of improvement was 53 percent.
  
- Safety
  - The rate of preventable accidents increased from three per 100,000 miles traveled in the first year to more than four by FY2018.
  - Casualty/liability costs per service per service hour and mile both jumped by more than 50 percent between FY2016 and FY2018. A negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
  - There were more than 18,000 work hours lost due to industrial accidents in FY2016, followed by significant reductions in the next two years to about 6,100 in FY2018.

\* \* \* \* \*

The following is a brief summary of the trolley coach functional trend highlights between FY2016 and FY2018:

- Service Planning results showed a 45 percent increase in the cost per passenger mile, steady levels of vehicle miles and hours in service, and the farebox recovery ratio decreasing to 22.5 percent by FY2018.
- Operations results showed some increase in operating costs incurred from vehicle operations, and an increase in vehicle operations costs per hour. Operator scheduled absences were steady at about ten percent of total hours worked, while unscheduled absences decreased somewhat to 4.1 percent. Schedule adherence went down from 65 to 62 percent, while missed trips were up to two percent in FY2018. At the same time, the overall rate of complaints was relatively steady.
- Maintenance results showed a reduction in total maintenance costs to 24 percent of the total operating costs, vehicle maintenance costs per mile increasing by 2.5 percent overall, the vehicle spare ratio near 40 percent in both FY2016 and FY2018, and significant improvement in the mechanical failure rates. In addition, mechanic pay hours increased slightly compared to vehicle service hours, while maintenance employee scheduled and unscheduled absences remained near 11 percent and four percent of total work hours.
- Safety results showed some increase in the preventable accident rate, and casualty/liability costs per service hour and mile both increasing by more than 50 percent overall. Meanwhile, there were significant reductions in lost time due to industrial accidents.

### Exhibit 13: Functional Performance Trends – Trolley Coach

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
<b>SERVICE PLANNING</b>			
Total Operating Cost/Passenger Mile	\$1.80	\$2.09	\$2.62
<i>Annual Percent Change</i>	--	16.3%	25.2%
<i>Three Year Percent Change</i>	--	--	45.6%
Vehicle Service Miles/Total Miles	95.5%	94.5%	94.5%
<i>Annual Percent Change</i>	--	-1.1%	0.0%
<i>Three Year Percent Change</i>	--	--	-1.1%
Vehicle Service Hours/Total Hours	96.4%	95.7%	95.8%
<i>Annual Percent Change</i>	--	-0.8%	0.1%
<i>Three Year Percent Change</i>	--	--	-0.7%
Farebox Revenue/Operating Cost	28.9%	24.8%	22.5%
<i>Annual Percent Change</i>	--	-14.3%	-9.2%
<i>Three Year Percent Change</i>	--	--	-22.2%
<b>OPERATIONS</b>			
Vehicle Operations Cost/Total Operating Cost	51.6%	54.1%	55.1%
<i>Annual Percent Change</i>	--	4.9%	1.8%
<i>Three Year Percent Change</i>	--	--	6.8%
Vehicle Operations Cost/Vehicle Service Hour	\$92.31	\$102.61	\$113.22
<i>Annual Percent Change</i>	--	11.2%	10.3%
<i>Three Year Percent Change</i>	--	--	22.6%
Operator Sched. Absences/Total Hours Worked	10.9%	11.0%	10.2%
<i>Annual Percent Change</i>	--	0.6%	-6.5%
<i>Three Year Percent Change</i>	--	--	-6.0%
Operator Unsched. Absences/Total Hours Worked	4.9%	4.8%	4.1%
<i>Annual Percent Change</i>	--	-0.3%	-14.7%
<i>Three Year Percent Change</i>	--	--	-14.9%
Trips On-Time	65%	63%	62%
<i>Annual Percent Change</i>	--	-3.1%	-1.6%
<i>Three Year Percent Change</i>	--	--	-4.6%
Complaints/100,000 Unlinked Passenger Trips	5.7	6.7	5.9
<i>Annual Percent Change</i>	--	17.2%	-11.2%
<i>Three Year Percent Change</i>	--	--	4.1%
Missed Trips	0.44%	1.00%	1.96%
<i>Annual Percent Change</i>	--	127.3%	96.0%
<i>Three Year Percent Change</i>	--	--	345.5%

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
<b>MAINTENANCE</b>			
Vehicle + Non-Veh. Maint. Cost/Total Operating Cost	28.7%	29.8%	24.0%
<i>Annual Percent Change</i>	--	3.9%	-19.6%
<i>Three Year Percent Change</i>	--	--	-16.5%
Vehicle Maintenance Cost/Vehicle Service Mile	\$5.04	\$5.84	\$5.16
<i>Annual Percent Change</i>	--	16.0%	-11.6%
<i>Three Year Percent Change</i>	--	--	2.5%
Mechanic Pay Hours/Vehicle Service Hours	16.8%	18.7%	18.2%
<i>Annual Percent Change</i>	--	11.2%	-3.0%
<i>Three Year Percent Change</i>	--	--	7.9%
Maintenance Employee Scheduled Absences	11.1%	11.1%	11.0%
<i>Annual Percent Change</i>	--	-0.1%	-1.2%
<i>Three Year Percent Change</i>	--	--	-1.2%
Maintenance Employee Unscheduled Absences	4.4%	4.5%	4.2%
<i>Annual Percent Change</i>	--	2.6%	-6.5%
<i>Three Year Percent Change</i>	--	--	-4.1%
Spare Vehicles/Total Vehicles	40.1%	24.8%	36.7%
<i>Annual Percent Change</i>	--	-38.1%	48.1%
<i>Three Year Percent Change</i>	--	--	-8.3%
Mean Distance between Major Failures (Miles)	4,132	5,456	5,981
<i>Annual Percent Change</i>	--	32.0%	9.6%
<i>Three Year Percent Change</i>	--	--	44.8%
Mean Distance between All Failures (Miles)	3,547	3,884	5,416
<i>Annual Percent Change</i>	--	9.5%	39.4%
<i>Three Year Percent Change</i>	--	--	52.7%
<b>SAFETY</b>			
Preventable Accidents/100,000 Vehicle Miles	2.97	3.36	4.14
<i>Annual Percent Change</i>	--	13.2%	23.1%
<i>Three Year Percent Change</i>	--	--	39.3%
Casualty & Liability Cost/Vehicle Service Hour	\$4.82	-\$1.03	\$7.34
<i>Annual Percent Change</i>	--	-121.4%	--
<i>Three Year Percent Change</i>	--	--	52.3%
Casualty & Liability Cost/Vehicle Service Mile	\$0.76	-\$0.16	\$1.20
<i>Annual Percent Change</i>	--	-121.6%	--
<i>Three Year Percent Change</i>	--	--	57.2%
Work Hours Lost Due to Industrial Accidents	18,315	13,585	6,169
<i>Annual Percent Change</i>	--	-25.8%	-54.6%
<i>Three Year Percent Change</i>	--	--	-66.3%



## Light Rail

SFMTA's light rail/historic trolley functional area performance trends for the audit period are discussed below and presented in Exhibit 14.

- Service Planning
  - Operating costs per passenger mile increased from \$1.54 in the first year to \$1.71 in FY2018 (10.9 percent).
  - Virtually all car miles traveled and car hours were in service in the first two years, with still more than 98 percent in FY2018.
  - The light rail farebox recovery ratio declined in each year, from 19.7 percent in FY2016 to 18.2 percent by FY2018.
  
- Operations
  - Vehicle operations costs increased from 31 percent of total operating costs in the first year to 35 percent in FY2018.
  - Vehicle operations costs per service hour increased overall from \$117 to \$134 (15 percent).
  - Operator scheduled absences remained at about 11 percent of total hours worked, while unscheduled absences decreased from five to four percent over the period.
  - Schedule adherence declined from 50 percent in FY2016 to 43 percent in the remainder of the audit period.
  - The rate of light rail related complaints remained at about 3.5 per 100,000 passengers in all three years.
  - The incidence of missed trips increased overall, from 1.9 percent in FY2016 to 2.3 percent by FY2018.

- Maintenance
  - Total maintenance costs (vehicle plus non-vehicle) were reduced from 52 percent of total operating costs in FY2016 to 48 percent by FY2018.
  - Vehicle maintenance costs were about \$15 per service mile in the first and last years of the audit period, with lower results in between (FY2017).
  - Mechanic pay hours remained in a range of 46 to 49 percent of vehicle service hours throughout the period.
  - Maintenance employee scheduled and unscheduled absences were reduced from 13 to 11 percent and five to four percent of total hours worked, respectively.
  - The car spare ratio was 21.1 percent in both FY2016 and FY2018, though only 16.2 percent in the interim year.
  - The mean distance between major failures declined slightly in FY2018 compared to the results in the prior two years. However, when looking at all failures, there was a steady and significant improvement through the period.
  
- Safety
  - The rate of preventable accidents increased from 0.7 per 100,000 miles traveled in the first year to about 1.0 subsequently.
  - Casualty/liability costs per service per service hour and mile both jumped by about 45 percent between FY2016 and FY2018. A negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
  - There were more than 11,000 work hours lost due to industrial accidents in FY2016, followed by significant reductions in the next two years to about 5,000 in FY2018.

\* \* \* \* \*

The following is a brief summary of the light rail functional trend highlights between FY2016 and FY2018:

- Service Planning results showed a 10.9 percent increase in the cost per passenger mile, virtually all car miles and hours in service, and the farebox recovery ratio decreasing to 18.2 percent by FY2018.
- Operations results showed a moderate increase to 35 percent of operating costs incurred from vehicle operations, and a 15 percent increase in vehicle operations costs per hour. Operator scheduled absences were steady at 11 percent of total hours worked, while unscheduled absences decreased from five to four percent. Schedule adherence went down from 50 to 43 percent, while missed trips were up to 2.3 percent in FY2018. At the same time, the overall rate of complaints was relatively steady.
- Maintenance results showed some decrease in the operating costs incurred from maintenance activities (vehicle and non-vehicle), vehicle maintenance costs of \$15 per mile and a vehicle spare ratio of 21.1 percent at the beginning and end of the audit period, and a slight decline in the rate of major mechanical failures but a significant improvement when looking at all failures. In addition, mechanic pay hours remained just under 50 percent of vehicle service hours, while maintenance employee scheduled and unscheduled absence rates were both reduced somewhat.
- Safety results showed some increase in the preventable accident rate, and casualty/liability costs per service hour and mile both increasing by about 45 percent overall. Meanwhile, there were significant reductions in lost time due to industrial accidents.

## Exhibit 14: Functional Performance Trends – Light Rail

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
<b>SERVICE PLANNING</b>			
Total Operating Cost/Passenger Mile	\$1.54	\$1.58	\$1.71
<i>Annual Percent Change</i>	--	2.5%	8.1%
<i>Three Year Percent Change</i>	--	--	10.9%
Car Service Miles/Total Miles	99.9%	99.9%	98.6%
<i>Annual Percent Change</i>	--	0.0%	-1.2%
<i>Three Year Percent Change</i>	--	--	-1.2%
Car Service Hours/Total Hours	99.5%	99.3%	98.5%
<i>Annual Percent Change</i>	--	-0.2%	-0.9%
<i>Three Year Percent Change</i>	--	--	-1.1%
Farebox Revenue/Operating Cost	19.7%	18.9%	18.2%
<i>Annual Percent Change</i>	--	-3.8%	-3.6%
<i>Three Year Percent Change</i>	--	--	-7.3%
<b>OPERATIONS</b>			
Vehicle Operations Cost/Total Operating Cost	31.4%	32.8%	34.7%
<i>Annual Percent Change</i>	--	4.6%	5.7%
<i>Three Year Percent Change</i>	--	--	10.5%
Vehicle Operations Cost/Car Service Hour	\$116.75	\$112.05	\$134.19
<i>Annual Percent Change</i>	--	-4.0%	19.8%
<i>Three Year Percent Change</i>	--	--	14.9%
Operator Sched. Absences/Total Hours Worked	11.6%	11.2%	11.2%
<i>Annual Percent Change</i>	--	-3.3%	-0.4%
<i>Three Year Percent Change</i>	--	--	-3.6%
Operator Unsched. Absences/Total Hours Worked	4.8%	5.0%	4.0%
<i>Annual Percent Change</i>	--	5.2%	-21.3%
<i>Three Year Percent Change</i>	--	--	-17.2%
Trips On-Time	50%	43%	43%
<i>Annual Percent Change</i>	--	-14.0%	0.0%
<i>Three Year Percent Change</i>	--	--	-14.0%
Complaints/100,000 Unlinked Passenger Trips	3.6	3.7	3.4
<i>Annual Percent Change</i>	--	4.6%	-9.3%
<i>Three Year Percent Change</i>	--	--	-5.1%
Missed Trips	1.86%	1.10%	2.32%
<i>Annual Percent Change</i>	--	-40.9%	110.9%
<i>Three Year Percent Change</i>	--	--	24.7%

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
<b>MAINTENANCE</b>			
Vehicle + Non-Veh. Maint. Cost/Total Operating Cost	52.2%	49.1%	47.8%
<i>Annual Percent Change</i>	--	-6.0%	-2.5%
<i>Three Year Percent Change</i>	--	--	-8.3%
Vehicle Maintenance Cost/Car Service Mile	\$15.27	\$12.28	\$15.09
<i>Annual Percent Change</i>	--	-19.6%	22.9%
<i>Three Year Percent Change</i>	--	--	-1.2%
Mechanic Pay Hours/Car Service Hours	49.3%	46.0%	48.9%
<i>Annual Percent Change</i>	--	-6.7%	6.3%
<i>Three Year Percent Change</i>	--	--	-0.8%
Maintenance Employee Scheduled Absences	13.1%	12.2%	11.4%
<i>Annual Percent Change</i>	--	-6.7%	-6.7%
<i>Three Year Percent Change</i>	--	--	-13.0%
Maintenance Employee Unscheduled Absences	5.0%	4.6%	4.2%
<i>Annual Percent Change</i>	--	-7.4%	-7.8%
<i>Three Year Percent Change</i>	--	--	-14.7%
Spare Cars/Total Cars	22.1%	16.2%	22.1%
<i>Annual Percent Change</i>	--	-26.7%	36.4%
<i>Three Year Percent Change</i>	--	--	0.0%
Mean Distance between Major Failures (Miles)	4,695	4,704	4,562
<i>Annual Percent Change</i>	--	0.2%	-3.0%
<i>Three Year Percent Change</i>	--	--	-2.8%
Mean Distance between All Failures (Miles)	861	1,047	1,601
<i>Annual Percent Change</i>	--	21.6%	53.0%
<i>Three Year Percent Change</i>	--	--	85.9%
<b>SAFETY</b>			
Preventable Accidents/100,000 Car Miles	0.70	1.03	0.96
<i>Annual Percent Change</i>	--	46.9%	-7.4%
<i>Three Year Percent Change</i>	--	--	36.1%
Casualty & Liability Cost/Car Service Hour	\$6.93	-\$1.48	\$9.93
<i>Annual Percent Change</i>	--	-121.4%	--
<i>Three Year Percent Change</i>	--	--	43.3%
Casualty & Liability Cost/Car Service Mile	\$0.77	-\$0.16	\$1.12
<i>Annual Percent Change</i>	--	-121.3%	--
<i>Three Year Percent Change</i>	--	--	45.2%
Work Hours Lost Due to Industrial Accidents	11,348	10,046	5,034
<i>Annual Percent Change</i>	--	-11.5%	-49.9%
<i>Three Year Percent Change</i>	--	--	-55.6%

## Cable Car

SFMTA's cable car functional area performance trends for the audit period are discussed below and presented in Exhibit 15.

- Service Planning
  - Operating costs per passenger mile remained steady at about \$8.60 through the audit period.
  - The portion of vehicle miles traveled that were in service remained at about 98 percent. Similarly, the portion of vehicle hours in service remained at about 99 percent.
  - The cable car farebox recovery ratio declined in each year, from 47 percent in FY2016 to less than 40 percent by FY2018.
  
- Operations
  - Vehicle operations costs remained in a range of 48 to 50 percent of total operating costs.
  - Vehicle operations costs per service hour increased overall by 7.7 percent, to \$237.39 in FY2018.
  - Operator scheduled absences remained at about 12 percent of total hours worked, and unscheduled absences at 4.7 percent.
  - The rate of cable car related complaints decreased steadily, from 4.3 per 100,000 passengers in FY2016 to 1.7 by FY2018.
  - The incidence of missed trips decreased overall, from 1.1 percent in FY2016 to 0.9 percent in the most recent year.

- Maintenance

- Total maintenance costs (vehicle plus non-vehicle) were in a range of 32 to 34 percent of total operating costs throughout the period.
- Vehicle maintenance costs per service mile increased from \$35 to \$40 in the first two years, and then returned to about \$35 in FY2018.
- Mechanic pay hours increased overall during the period, from 36 percent to 38.5 percent of vehicle service hours.
- Maintenance employee scheduled absences increased from 11.4 to 12.8 percent of total hours worked, while unscheduled absences decreased from 5.8 to 4.0 percent.
- The car spare ratio remained at 32.5 percent.
- The mean distance between major failures fell by 76 percent overall during the period, to 1,116 miles in FY2018. When looking at all failures, however, an improvement was recorded, from 130 to 334 miles.

- Safety

- The rate of preventable accidents more than doubled from 3.0 per 100,000 miles traveled in FY2016 to 6.6 in FY2017, but then decreased in FY2018 to about 3.6.
- Casualty/liability costs per service per service hour and mile both jumped, by 63 percent and 47 percent respectively, between FY2016 and FY2018. A negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
- There were about 3,800 work hours lost due to industrial accidents in both FY2016 and FY2018, with slightly fewer reported for the interim year.

\* \* \* \* \*

The following is a brief summary of the cable car functional trend highlights between FY2016 and FY2018:

- Service Planning results showed the cost per passenger mile remaining at about \$8.60, virtually all car miles and hours in service, and the farebox recovery ratio decreasing to less than 40 percent by FY2018.
- Operations results showed a relatively steady trend in operating costs incurred from vehicle operations, but a 7.7 percent overall increase in vehicle operations costs per hour. Operator scheduled absences were steady at about 12 percent of total hours worked, with unscheduled absences at 4.7 percent. Missed trips were down moderately to 0.9 percent in FY2018, and the rate of complaints decreased steadily.
- Maintenance results showed little change in the portion of operating costs incurred from maintenance activities (vehicle and non-vehicle), vehicle maintenance costs of about \$35 per mile at the beginning and end of the audit period, a steady 32.5 percent vehicle spare ratio, and a large decline in the rate of major mechanical failures but improvement when looking at all failures. In addition, mechanic pay hours increased slightly to 38.5 percent of car service hours, while maintenance employee scheduled absences increased somewhat and unscheduled absences decreased.
- Safety results showed a relatively small overall increase in the preventable accident rate, and casualty/liability costs per service hour and mile increasing by 63 percent and 47 percent overall, respectively. Meanwhile, the results for lost time due to industrial accidents were essentially steady.



## Exhibit 15: Functional Performance Trends – Cable Car

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
<b>SERVICE PLANNING</b>			
Total Operating Cost/Passenger Mile	\$8.58	\$8.56	\$8.63
<i>Annual Percent Change</i>	--	-0.3%	0.9%
<i>Three Year Percent Change</i>	--	--	0.6%
Car Service Miles/Total Miles	97.6%	97.6%	97.9%
<i>Annual Percent Change</i>	--	0.1%	0.3%
<i>Three Year Percent Change</i>	--	--	0.3%
Car Service Hours/Total Hours	98.9%	98.9%	98.9%
<i>Annual Percent Change</i>	--	0.1%	0.0%
<i>Three Year Percent Change</i>	--	--	0.1%
Farebox Revenue/Operating Cost	47.0%	40.4%	39.4%
<i>Annual Percent Change</i>	--	-14.0%	-2.4%
<i>Three Year Percent Change</i>	--	--	-16.0%
<b>OPERATIONS</b>			
Vehicle Operations Cost/Total Operating Cost	49.5%	47.5%	50.7%
<i>Annual Percent Change</i>	--	-4.0%	6.8%
<i>Three Year Percent Change</i>	--	--	2.6%
Vehicle Operations Cost/Car Service Hour	\$220.50	\$215.99	\$237.39
<i>Annual Percent Change</i>	--	-2.0%	9.9%
<i>Three Year Percent Change</i>	--	--	7.7%
Operator Sched. Absences/Total Hours Worked	12.0%	12.1%	11.8%
<i>Annual Percent Change</i>	--	1.5%	-3.0%
<i>Three Year Percent Change</i>	--	--	-1.6%
Operator Unsched. Absences/Total Hours Worked	4.7%	4.6%	4.7%
<i>Annual Percent Change</i>	--	-2.9%	1.9%
<i>Three Year Percent Change</i>	--	--	-1.0%
Trips On-Time	(a)	(a)	(a)
<i>Annual Percent Change</i>	--	--	--
<i>Three Year Percent Change</i>	--	--	--
Complaints/100,000 Unlinked Passenger Trips	4.3	3.3	1.7
<i>Annual Percent Change</i>	--	-22.9%	-49.6%
<i>Three Year Percent Change</i>	--	--	-61.1%
Missed Trips	1.14%	0.63%	0.90%
<i>Annual Percent Change</i>	--	-44.7%	42.9%
<i>Three Year Percent Change</i>	--	--	-21.1%

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
<b>MAINTENANCE</b>			
Vehicle + Non-Veh. Maint. Cost/Total Operating Cost	32.6%	34.2%	32.1%
<i>Annual Percent Change</i>	--	5.0%	-6.3%
<i>Three Year Percent Change</i>	--	--	-1.7%
Vehicle Maintenance Cost/Car Service Mile	\$35.09	\$40.32	\$34.70
<i>Annual Percent Change</i>	--	14.9%	-13.9%
<i>Three Year Percent Change</i>	--	--	-1.1%
Mechanic Pay Hours/Car Service Hours	36.0%	41.7%	38.5%
<i>Annual Percent Change</i>	--	15.6%	-7.6%
<i>Three Year Percent Change</i>	--	--	6.9%
Maintenance Employee Scheduled Absences	11.4%	11.6%	12.8%
<i>Annual Percent Change</i>	--	1.6%	11.0%
<i>Three Year Percent Change</i>	--	--	12.8%
Maintenance Employee Unscheduled Absences	5.8%	4.6%	4.0%
<i>Annual Percent Change</i>	--	-21.2%	-13.3%
<i>Three Year Percent Change</i>	--	--	-31.6%
Spare Cars/Total Cars	32.5%	32.5%	32.5%
<i>Annual Percent Change</i>	--	0.0%	0.0%
<i>Three Year Percent Change</i>	--	--	0.0%
Mean Distance between Major Failures (Miles)	4,648	(a)	1,116
<i>Annual Percent Change</i>	--	--	--
<i>Three Year Percent Change</i>	--	--	-76.0%
Mean Distance between All Failures (Miles)	130	(a)	334
<i>Annual Percent Change</i>	--	--	--
<i>Three Year Percent Change</i>	--	--	156.5%
<b>SAFETY</b>			
Preventable Accidents/100,000 Car Miles	3.02	6.65	3.61
<i>Annual Percent Change</i>	--	120.2%	-45.7%
<i>Three Year Percent Change</i>	--	--	19.5%
Casualty & Liability Cost/Car Service Hour	\$1.41	-\$0.29	\$2.30
<i>Annual Percent Change</i>	--	-120.9%	--
<i>Three Year Percent Change</i>	--	--	62.9%
Casualty & Liability Cost/Car Service Mile	\$0.76	-\$0.16	\$1.12
<i>Annual Percent Change</i>	--	-121.6%	--
<i>Three Year Percent Change</i>	--	--	47.4%
Work Hours Lost Due to Industrial Accidents	3,821	3,666	3,876
<i>Annual Percent Change</i>	--	-4.1%	5.7%
<i>Three Year Percent Change</i>	--	--	1.4%

(a) Not available

## Paratransit

SFMTA's paratransit functional area performance trends for the audit period are discussed below and presented in Exhibit 16.

- Service Planning
  - The operating cost per passenger mile increased in each year, from \$6.50 in the FY2016 to \$7.67 in the last year (18 percent).
  - There was some decrease in the portion of vehicle miles traveled that were in service, from 82 percent in FY2016 and FY2017 to 78 percent subsequently.
  - The portion of vehicle hours in service dropped from 86 percent to 84 percent over the audit period.
  - The paratransit farebox recovery ratio declined from 5.8 percent in FY2016 to 5.3 percent in FY2017, and then returned to 5.8 percent in the last year.
  
- Operations
  - Vehicle operations costs remained at about 75 percent of total operating costs through the audit period.
  - ADA trip schedule adherence declined from 88.6 percent in FY2016 to 85.7 percent in FY2018.
  - The complaint rate increased slightly overall, from 15.1 to 16.1 complaints per 10,000 passenger trips (4.1 percent).
  - The incidence of missed trips increased from 0.46 percent of total trips in the first year to 0.77 percent by FY2018.
  - There were no ADA trip denials.

- The rate of trip cancellations increased overall from 14.6 to 15.9 percent of total ADA trips, while late trip cancellations were reduced from 4.2 to 3.4 percent.
- Passenger no-shows rose in each year, from 3.0 percent of total ADA trips in FY2016 to 4.4 percent in FY2018.
- Maintenance
  - Total maintenance costs (vehicle plus non-vehicle) remained at 9.2 percent of total operating costs in all three years.
  - Vehicle maintenance costs per service mile increased overall from about \$0.90 in the first two years to \$0.99 in FY2018 (8.3 percent).
  - The vehicle spare ratio went down from 20 percent in the first year to 12.6 percent in both FY2017 and FY2018.
  - The mean distance between major mechanical failures declined by nearly 50 percent between FY2016 and FY2017, and then was about steady in FY2018.
  - The mean distance between all mechanical failures declined by one-third between FY2016 and FY2017, and then rebounded partially in FY2018, for a net period decline of 14 percent.
- Safety
  - The rate of FTA reportable accidents improved overall by 32 percent, from 0.19 per 100,000 vehicle miles in FY2016 to 0.13 in FY2018. There were no reportable accidents in FY2017.

\* \* \* \* \*

The following is a brief summary of the paratransit functional trend highlights between FY2016 and FY2018:

- Service Planning results showed an 18 percent net increase in the cost per passenger mile, decreases to 78 percent and 84 percent of vehicle miles and hours in service respectively, and farebox recovery at 5.8 percent at the beginning and end of the period.
- Operations results showed a consistent 75 percent of operating costs incurred from vehicle operations, and the complaint rate increasing slightly overall. Schedule adherence declined somewhat to about 86 percent, and missed trips also increased but remained very low in absolute terms. At the same time, there were no ADA trip denials, and the trip cancellation and passenger no-show rates did not change significantly.
- Maintenance results showed a steady 9.2 percent of operating costs incurred from maintenance activities (vehicle and non-vehicle), vehicle maintenance costs per mile increasing by 8.3 percent, the vehicle spare ratio reduced from 20 percent to 12.6 percent, and a noticeable decline in the rate of major mechanical failures early in the period but a smaller net period decline when looking at all failures.
- Safety results showed a 32 percent overall improvement in the FTA reportable accident rate.

## Exhibit 16: Functional Performance Trends – Paratransit

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
<b>SERVICE PLANNING</b>			
Total Operating Cost/Passenger Mile	\$6.50	\$7.02	\$7.67
<i>Annual Percent Change</i>	--	8.0%	9.3%
<i>Three Year Percent Change</i>	--	--	18.1%
Vehicle Service Miles/Total Miles	82.1%	82.2%	77.8%
<i>Annual Percent Change</i>	--	0.1%	-5.4%
<i>Three Year Percent Change</i>	--	--	-5.3%
Vehicle Service Hours/Total Hours	86.2%	85.6%	84.2%
<i>Annual Percent Change</i>	--	-0.7%	-1.6%
<i>Three Year Percent Change</i>	--	--	-2.3%
Farebox Revenue/Operating Cost	5.8%	5.3%	5.8%
<i>Annual Percent Change</i>	--	-8.5%	8.7%
<i>Three Year Percent Change</i>	--	--	-0.5%
<b>OPERATIONS</b>			
Vehicle Operations Cost/Total Operating Cost	75.8%	75.9%	75.7%
<i>Annual Percent Change</i>	--	0.1%	-0.2%
<i>Three Year Percent Change</i>	--	--	-0.1%
Trips On-Time/Total ADA Trips	88.6%	87.5%	85.7%
<i>Annual Percent Change</i>	--	-1.2%	-2.1%
<i>Three Year Percent Change</i>	--	--	-3.3%
Complaints/10,000 Passenger Trips	15.5	15.3	16.1
<i>Annual Percent Change</i>	--	-1.0%	5.1%
<i>Three Year Percent Change</i>	--	--	4.1%
Missed Trips/Total Trips	0.46%	0.58%	0.77%
<i>Annual Percent Change</i>	--	26.6%	32.4%
<i>Three Year Percent Change</i>	--	--	67.7%
ADA Trip Denials/Total ADA Trips	0.0%	0.0%	0.0%
<i>Annual Percent Change</i>	--	--	--
<i>Three Year Percent Change</i>	--	--	--
Trip Cancellations/Total ADA Trips	14.6%	14.3%	15.9%
<i>Annual Percent Change</i>	--	-2.1%	11.2%
<i>Three Year Percent Change</i>	--	--	8.8%
Late Trip Cancellations/Total ADA Trips	4.2%	3.2%	3.4%
<i>Annual Percent Change</i>	--	-22.6%	5.4%
<i>Three Year Percent Change</i>	--	--	-18.4%
No-Show Passengers/Total ADA Trips	3.0%	3.5%	4.4%
<i>Annual Percent Change</i>	--	17.9%	26.1%
<i>Three Year Percent Change</i>	--	--	48.7%

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
<b>MAINTENANCE</b>			
Vehicle + Non-Veh. Maint. Cost/Total Operating Cost	9.19%	9.20%	9.16%
<i>Annual Percent Change</i>	--	0.1%	-0.4%
<i>Three Year Percent Change</i>	--	--	-0.3%
Vehicle Maintenance Cost/Vehicle Service Mile	\$0.91	\$0.89	\$0.99
<i>Annual Percent Change</i>	--	-2.6%	11.2%
<i>Three Year Percent Change</i>	--	--	8.3%
Spare Vehicles/Total Vehicles	20.0%	12.6%	12.6%
<i>Annual Percent Change</i>	--	-37.1%	0.0%
<i>Three Year Percent Change</i>	--	--	-37.1%
Mean Dist. betw. Major Failures (Miles)	40,865	21,373	21,744
<i>Annual Percent Change</i>	--	-47.7%	1.7%
<i>Three Year Percent Change</i>	--	--	-46.8%
Mean Dist. betw. All Failures (Miles)	22,849	15,150	19,570
<i>Annual Percent Change</i>	--	-33.7%	29.2%
<i>Three Year Percent Change</i>	--	--	-14.4%
<b>SAFETY</b>			
FTA Reportable Accidents/100,000 Vehicle Miles	0.19	0.00	0.13
<i>Annual Percent Change</i>	--	-100.0%	--
<i>Three Year Percent Change</i>	--	--	-32.1%

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## VII. CONCLUSIONS AND RECOMMENDATIONS

The preceding sections presented a review of SFMTA's transit service performance during the three-year period of FY2016 through FY2018 (July 1, 2015 through June 30, 2018). They focused on TDA compliance issues including trends in TDA-mandated performance indicators and compliance with selected sections of the state Public Utilities Code (PUC). They also provided the findings from an overview of SFMTA's data collection activities to support the TDA indicators, actions taken to implement recommendations from the prior performance audit, and a review of selected key functional performance results.

### Conclusions

The key findings and conclusions from the individual sections of this performance audit are summarized below:

- Data Collection – SFMTA is in compliance with the data collection and reporting requirements for these performance indicators. In addition, most of the statistics collected over the six-year review period appear to be consistent with the TDA definitions, and indicate general consistency in terms of the direction and magnitude of the year-to-year changes across the statistics.

However, it was observed that in the earlier years, there were reported declines in motor coach and especially trolley coach ridership that SFMTA suggested did not reflect actual ridership trends but resulted from measurement errors with the aging automatic passenger counters (APCs). This may also have had an impact in the later years, specifically where reported trolley coach passenger levels declined sharply toward the end of the current audit period.

Further, a change in data methodology to more accurately capture missed service through enhanced use of the Central Control Logs and the Automatic Train Control System (ACTS) resulted in significantly reduced

car service hours and miles being reported for light rail starting in FY2014 and cable car in FY2015.

- TDA Performance Trends

SFMTA's performance trends for the five TDA-mandated indicators were analyzed by mode. A six-year analysis period was used for all the indicators. In addition, component operating costs were analyzed for the six-year period.

Motor Coach – The following is a brief summary of the TDA performance trend highlights over the six-year period of FY2013 through FY2018:

- There was an average annual increase in the operating cost per hour of 0.7 percent, which amounted to a 2.1 percent decrease in inflation adjusted dollars.
- The cost per passenger increased on average by 2.8 percent per year, which amounted to steady performance (\$2.65 per passenger) when expressed in constant FY2013 dollars.
- Passenger productivity exhibited a downward trend. Passengers per vehicle service hour and mile declined by 2.1 percent and 1.1 percent per year on average, as service levels increased at a moderately higher rate than passengers.
- Employee productivity decreased an average 2.1 percent per year.

The following is a brief summary of the component operating costs trend highlights for the motor coach service between FY2013 and FY2018:

- The most significant change was an average annual increase of more than 27 percent in the casualty/liability area. In addition, a negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
- Labor costs represented the largest portion of the total costs, with a share that generally increased from 36 percent to 40 percent over the

six years. Fringe benefits comprised the second largest portion, ranging between 31 and 35 percent during the review period. Labor and fringe benefits costs both increased by 7.7 percent on average per year.

- Materials/supplies costs generally decreased over the period from 16 to eight percent of total costs, and other cost categories each generally contributed 13 percent or less.

Trolley Coach – The following is a brief summary of the TDA performance trend highlights over the six-year period of FY2013 through FY2018:

- There was an average annual increase in the operating cost per hour of 6.6 percent, or 3.6 percent in inflation adjusted dollars. Operating expenses increased by 4.4 percent per year overall, while vehicle service hours were reduced by two percent at the same time.
- The cost per passenger increased on average by 10.5 percent per year, which amounted to an average annual increase of 7.4 percent in constant FY2013 dollars. The cost per passenger increased, by at least eight percent, in every year except FY2016. Operating costs generally continued to rise while passenger levels declined significantly, especially toward the end of the period.
- Passenger productivity declined as well, with passengers per vehicle service hour decreasing by 3.5 percent per year overall, and passengers per vehicle service mile decreasing by 2.8 percent.
- Employee productivity decreased an average 5.1 percent per year.

The following is a brief summary of the component operating costs trend highlights for the trolley coach service between FY2013 and FY2018:

- The most significant change was an average annual increase of 21.5 percent in the casualty/liability area. In addition, a negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
- Labor costs represented the largest portion of the total costs, with a share that ranged between 40 and 45 percent over the six years.

Fringe benefits comprised the second largest portion, remaining at about 35 percent during the review period. Labor and fringe benefits costs both increased by about 4.5 percent on average per year.

- Materials/supplies costs generally decreased over the period, by 7.5 percent per year on average. At the same time, services and “other expenses” increased by about six and 14 percent per year on average, respectively.

Light Rail – The following is a brief summary of the TDA performance trend highlights over the six-year period of FY2013 through FY2018:

- There was an average annual increase in the operating cost per hour of five percent, or 2.1 percent in inflation adjusted dollars. Operating expenses increased by 4.9 percent per year overall, while car service hours were reduced by less than one percent at the same time.
- The cost per passenger increased on average by 3.6 percent per year, which amounted to an average annual increase of 0.7 percent in constant FY2013 dollars. The cost per passenger increased primarily toward the end of the review period, as operating costs continued to increase while passenger levels began to decline somewhat.
- Passenger productivity improved over the period, with passengers per car service hour increasing by 1.4 percent per year overall, and passengers per car service mile increasing by 1.6 percent.
- Employee productivity decreased an average 5.3 percent per year.

The following is a brief summary of the component operating costs trend highlights for the light rail service between FY2013 and FY2018:

- The most significant change was an average annual increase of nearly 23 percent in the casualty/liability area. In addition, a negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.

- Labor costs represented the largest portion of the total costs, with a share of about 40 percent over the six years. Fringe benefits comprised the second largest portion, remaining in a range of 30 to 35 percent during the review period. Labor and fringe benefits costs both increased by about six percent on average per year.
- Materials/supplies costs generally decreased over the period, by 2.2 percent per year on average. At the same time, services and “other expenses” increased by about five and 12 percent per year on average, respectively.

Cable Car – The following is a brief summary of the TDA performance trend highlights over the six-year period of FY2013 through FY2018:

- There was an average annual increase in the operating cost per hour of 5.1 percent, or 2.1 percent in inflation adjusted dollars. Operating expenses increased by more than five percent per year overall, while car service hours went up by less than one percent.
- The cost per passenger increased on average by 7.3 percent per year, which amounted to an average annual increase of 4.3 percent in constant FY2013 dollars. The cost per passenger increased primarily in the middle years of the review period, by more than 20 percent in both FY2015 and FY2016.
- Passenger productivity declined somewhat over the period, with passengers per car service hour decreasing by 2.1 percent per year overall, and passengers per car service mile decreasing by 1.5 percent.
- Employee productivity decreased an average 2.6 percent per year.

The following is a brief summary of the component operating costs trend highlights for the cable car service between FY2013 and FY2018:

- The most significant changes were average annual increases of 23 percent in the services area and 13 percent in casualty/liability costs. In addition, a negative expense in casualty/liability was reported to

the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.

- Labor costs represented the largest portion of the total costs, with a share of about 50 percent over the six years. Fringe benefits comprised the second largest portion, remaining at just over 40 percent during the review period. Labor and fringe benefits costs both increased between five and six percent on average per year.
- Materials/supplies costs generally decreased over the period, by 5.3 percent per year on average. At the same time, “other expenses” increased by about seven percent per year on average, but remained a very small portion of total costs.

Paratransit (Excluding Taxi) – The following is a brief summary of the TDA performance trend highlights over the six-year period of FY2013 through FY2018:

- There was an average annual increase in the operating cost per hour of 5.8 percent, or 2.8 percent in inflation adjusted dollars. Operating expenses increased by ten percent per year overall, while vehicle service hours went up just four percent.
- The cost per passenger increased on average by 16.1 percent per year, which amounted to an average annual increase of 12.9 percent in constant FY2013 dollars. The cost per passenger increased substantially in each year, as operating costs continued to climb but passenger levels steadily declined.
- Passenger productivity also declined significantly over the period, with passengers per vehicle service hour decreasing by 8.9 percent per year overall, and passengers per vehicle service mile decreasing by 6.6 percent.

The following is a brief summary of the component operating costs trend highlights for the paratransit service between FY2013 and FY2018:

- Total annual costs increased by ten percent on average, driven by a corresponding increase in purchased transportation costs – by far the largest component cost category. Purchased transportation costs

continued to be the source of about 98 percent of all costs in all six years.

- In-house labor and fringe benefits costs both increased about 15 percent on average per year. Costs in several other categories showed significant percent changes as well, but they comprised a very small portion of the total costs.
- No casualty/liability costs were reported in the first three years, and no services costs were reported in the last three years. A negative expense in casualty/liability was reported to the NTD for FY2017, reflecting a reduction in general liability per actuarial calculations.
- PUC Compliance – SFMTA is in compliance with the sections of the state PUC that were reviewed as part of this performance audit. The sections reviewed included requirements concerning CHP safety inspections, labor contracts, reduced fares, Welfare-to-Work, revenue sharing, and evaluation of passenger needs.
- Status of Prior Audit Recommendations – One of the two recommendations has been implemented. Through the current audit period and beyond, SFMTA Paratransit has been using automatically generated data to report all SF Access and Intercounty trips while using a limited manual validation for all electronically reported Group Van trips. It appears that the previous reporting discrepancies have been eliminated and paratransit passenger trip data is now consistent and accurate across all reporting systems.

Implementation is in progress for the remaining recommendation. Efforts are continuing toward obtaining accurate results from SFMTA's automatic passenger counters. SFMTA is in the process of moving from its original autonomous APC data collection system to an APC system developed by Conduent, Inc., and is working on a suite of analytical tools to monitor the APC system data and identify glitches and speed up remedies. Further, SFMTA is nearing completion of a major APC validation effort that compares APC counts with manual counts.

- Functional Performance Indicator Trends

To further assess SFMTA's performance over the past three years, a detailed set of systemwide and modal functional area performance indicators was defined and reviewed.

Systemwide (All Modes) – The following is a brief summary of the systemwide functional trend highlights between FY2016 and FY2018:

- Administrative costs comprised between 18 and 20 percent of total operating costs, and increased from \$41 to \$45 per vehicle service hour.
- Marketing costs increased compared to total administrative costs and also relative to passenger trips.
- The systemwide farebox recovery ratio declined steadily from 25.7 percent to 23.7 percent.

Motor Coach – The following is a brief summary of the motor coach functional trend highlights between FY2016 and FY2018:

- Service Planning results showed a 15 percent increase in the cost per passenger mile, steady performance in the portions of vehicle miles and hours in service, and the farebox recovery ratio increasing overall to 26.3 percent by FY2018.
- Operations results showed some increase in operating costs incurred from vehicle operations, and a net increase in vehicle operations costs per hour. Operator scheduled absences were steady at about ten percent of total hours worked, while unscheduled absences remained at about 4.5 percent. Schedule adherence went down from 61 to 57 percent, while missed trips were up to 2.8 percent in FY2018. At the same time, the rate of complaints was reduced.
- Maintenance results showed a reduction in total maintenance costs to 21 percent of the total operating costs, vehicle maintenance costs per mile decreasing by 18 percent, the vehicle spare ratio increasing



steadily to 25 percent in FY2018, and improvement in the mechanical failure rates. In addition, mechanic pay hours decreased compared to vehicle service hours, while maintenance employee scheduled and unscheduled absences remained near 12 percent and five percent of total work hours.

- Safety results showed the preventable accident rate increasing slightly, casualty/liability costs per service hour and mile both increasing by more than 40 percent overall, and some reduction in lost time due to industrial accidents in FY2018.

Trolley Coach – The following is a brief summary of the trolley coach functional trend highlights between FY2016 and FY2018:

- Service Planning results showed a 45 percent increase in the cost per passenger mile, steady levels of vehicle miles and hours in service, and the farebox recovery ratio decreasing to 22.5 percent by FY2018.
- Operations results showed some increase in operating costs incurred from vehicle operations, and an increase in vehicle operations costs per hour. Operator scheduled absences were steady at about ten percent of total hours worked, while unscheduled absences decreased somewhat to 4.1 percent. Schedule adherence went down from 65 to 62 percent, while missed trips were up to two percent in FY2018. At the same time, the overall rate of complaints was relatively steady.
- Maintenance results showed a reduction in total maintenance costs to 24 percent of the total operating costs, vehicle maintenance costs per mile increasing by 2.5 percent overall, the vehicle spare ratio near 40 percent in both FY2016 and FY2018, and significant improvement in the mechanical failure rates. In addition, mechanic pay hours increased slightly compared to vehicle service hours, while maintenance employee scheduled and unscheduled absences remained near 11 percent and four percent of total work hours.
- Safety results showed some increase in the preventable accident rate, and casualty/liability costs per service hour and mile both increasing

by more than 50 percent overall. Meanwhile, there were significant reductions in lost time due to industrial accidents.

Light Rail – The following is a brief summary of the light rail/historical trolley functional trend highlights between FY2016 and FY2018:

- Service Planning results showed a 10.9 percent increase in the cost per passenger mile, virtually all car miles and hours in service, and the farebox recovery ratio decreasing to 18.2 percent by FY2018.
- Operations results showed a moderate increase to 35 percent of operating costs incurred from vehicle operations, and a 15 percent increase in vehicle operations costs per hour. Operator scheduled absences were steady at 11 percent of total hours worked, while unscheduled absences decreased from five to four percent. Schedule adherence went down from 50 to 43 percent, while missed trips were up to 2.3 percent in FY2018. At the same time, the overall rate of complaints was relatively steady.
- Maintenance results showed some decrease in the operating costs incurred from maintenance activities (vehicle and non-vehicle), vehicle maintenance costs of \$15 per mile and a vehicle spare ratio of 21.1 percent at the beginning and end of the audit period, and a slight decline in the rate of major mechanical failures but a significant improvement when looking at all failures. In addition, mechanic pay hours remained just under 50 percent of car service hours, while maintenance employee scheduled and unscheduled absence rates were both reduced somewhat.
- Safety results showed some increase in the preventable accident rate, and casualty/liability costs per service hour and mile both increasing by about 45 percent overall. Meanwhile, there were significant reductions in lost time due to industrial accidents.

Cable Car – The following is a brief summary of the cable car functional trend highlights between FY2016 and FY2018:

- Service Planning results showed the cost per passenger mile remaining at about \$8.60, virtually all car miles and hours in service,

and the farebox recovery ratio decreasing to less than 40 percent by FY2018.

- Operations results showed a relatively steady trend in operating costs incurred from vehicle operations, but a 7.7 percent overall increase in vehicle operations costs per hour. Operator scheduled absences were steady at about 12 percent of total hours worked, with unscheduled absences at 4.7 percent. Missed trips were down moderately to 0.9 percent in FY2018, and the rate of complaints decreased steadily.
- Maintenance results showed little change in the portion of operating costs incurred from maintenance activities (vehicle and non-vehicle), vehicle maintenance costs of about \$35 per mile at the beginning and end of the audit period, a steady 32.5 percent vehicle spare ratio, and a large decline in the rate of major mechanical failures but improvement when looking at all failures. In addition, mechanic pay hours increased slightly to 38.5 percent of car service hours, while maintenance employee scheduled absences increased somewhat and unscheduled absences decreased.
- Safety results showed a relatively small overall increase in the preventable accident rate, and casualty/liability costs per service hour and mile increasing by 63 percent and 47 percent overall, respectively. Meanwhile, the results for lost time due to industrial accidents were essentially steady.

Paratransit – The following is a brief summary of the paratransit functional trend highlights between FY2016 and FY2018:

- Service Planning results showed an 18 percent net increase in the cost per passenger mile, decreases to 78 percent and 84 percent of vehicle miles and hours in service respectively, and farebox recovery at 5.8 percent at the beginning and end of the period.
- Operations results showed a consistent 75 percent of operating costs incurred from vehicle operations, and the complaint rate increasing slightly overall. Schedule adherence declined somewhat to about 86 percent, and missed trips also increased but remained very low in

absolute terms. At the same time, there were no ADA trip denials, and the trip cancellation and passenger no-show rates did not change significantly.

- Maintenance results showed a steady 9.2 percent of operating costs incurred from maintenance activities (vehicle and non-vehicle), vehicle maintenance costs per mile increasing by 8.3 percent, the vehicle spare ratio reduced from 20 percent to 12.6 percent, and a noticeable decline in the rate of major mechanical failures early in the period but a smaller net period decline when looking at all failures.
- Safety results showed a 32 percent overall improvement in the FTA reportable accident rate.

## Recommendations

1. CONTINUE EFFORTS TOWARD OBTAINING ACCURATE RESULTS FROM SFMTA'S AUTOMATIC PASSENGER COUNTERS.

*[Reference Sections: II. Review of TDA Data Collection and Reporting Methods; V. Status of Prior Audit Recommendations]*

In the prior audit period, it was found that reported declines in motor coach and trolley coach ridership appeared to reflect measurement errors with the older-generation automatic passenger counters (APCs) still in use. SFMTA reported it was working to ensure that ridership data is accurate, and that both legacy and future APC systems are properly operating. It is also starting to regularly track other indicators of ridership.

During the current audit period and beyond, efforts have continued toward obtaining accurate results from SFMTA's automatic passenger counters. SFMTA reported being in the process of moving from its original autonomous APC data collection system to an APC system developed by Conduent, Inc., and is working

on a suite of analytical tools to monitor the APC system data and identify glitches and speed up remedies. Further, SFMTA is nearing completion of a major APC validation effort that compares APC counts with manual counts.

SFMTA should continue its activities related to validating its legacy APCs and improving business processes around the APCs to ensure that ridership data is accurate. Further, as new vehicles with the latest generation technology APCs are phased in, SFMTA should ensure the future APC systems are properly validated, maintained, and integrated with other in-vehicle systems.

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**APPENDIX A:  
INPUT STATISTICS FOR  
FUNCTIONAL PERFORMANCE MEASURES**

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## Functional Performance Inputs - Systemwide (All Modes)

Data Item	FY2016	FY2017	FY2018	Source
Total Operating Costs	\$803,584,743	\$819,725,235	\$858,941,368	NTD F-40
Administrative Costs	\$151,202,544	\$145,437,951	\$169,962,791	NTD F-40
Vehicle Service Hours	3,681,698	3,885,640	3,780,875	NTD S-10 (all modes)
Marketing Costs	\$91,345	\$148,850	\$112,638	Transit income statement - Advertising A/C
Unlinked Passenger Trips	232,827,475	226,261,960	225,056,242	NTD S-10 (all modes)
Farebox Revenue (All Modes)	\$206,463,416	\$196,978,190	\$203,507,039	NTD F-10



## Functional Performance Inputs – Motor Coach

Data Item	FY2016	FY2017	FY2018	Source
Vehicle Service Miles	13,497,051	14,922,469	14,626,744	NTD S-10 MB
Total Vehicle Miles	15,381,690	16,933,408	16,618,811	NTD S-10 MB
Vehicle Service Hours	1,669,527	1,910,010	1,868,233	NTD S-10 MB
Total Vehicle Hours	1,813,488	2,063,975	2,022,928	NTD S-10 MB
Unlinked Passenger Trips	101,846,949	107,795,832	111,809,076	NTD S-10 MB
Farebox Revenue	\$79,223,774	\$82,908,312	\$89,852,474	NTD F-10
Total Operating Costs	\$311,440,005	\$329,281,264	\$341,543,252	NTD F-30 MB
Passenger Miles	230,498,077	231,620,604	220,051,925	NTD S-10 MB
Vehicle Operations Costs	\$170,853,635	\$184,794,089	\$195,199,328	NTD F-30 MB
Total Operator Time (Hours)	2,458,277	2,521,679	2,463,194	SFMTA Staff (Trapeze)
Operator Scheduled Absences (Hours)	245,737	264,033	244,249	SFMTA Staff (Trapeze)
Operator Unscheduled Absences (Hours)	113,783	116,751	109,717	SFMTA Staff (Trapeze)
Trips On-Time	61%	60%	57%	SFMTA Staff (AVL)
Complaints	7,116	6,725	5,792	SFMTA Staff (PSRs)
Missed Trips	0.44%	0.93%	2.83%	SFMTA Staff (Trapeze)
Mechanic Pay Hours	333,419	331,836	326,710	Payroll
Total Maintenance Employee Time (Hours)	662,602	689,821	700,819	NTD R-10
Maint. Employee Sched. Absences (Hours)	80,758	87,476	82,972	Payroll
Maint. Employee Unsched. Absences (Hours)	35,174	39,841	33,662	Payroll
Vehicle Maintenance Costs	\$67,106,950	\$69,951,551	\$61,843,835	NTD F-30 MB
Non-Vehicle Maintenance Costs	\$9,917,136	\$13,889,493	\$10,225,128	NTD F-30 MB
Spare Vehicles (Total less Maximum Service)	109	141	162	NTD S-10 MB
Total Vehicles	584	618	655	NTD S-10 MB
Revenue Vehicle Mechanical System Failures - Total	2,207	2,388	2,056	NTD R-20
Revenue Vehicle Mechanical System Failures - Major	2,053	1,934	1,985	NTD R-20
Preventable Accidents	402	457	458	TransitSafe_Incident Management System database
Casualty/Liability Costs	\$10,450,955	-\$2,443,161	\$16,391,228	NTD F-30 MB
Lost Hours - Industrial Accidents	20,655	22,301	17,831	OSHA Report

## Functional Performance Inputs – Trolley Coach

Data Item	FY2016	FY2017	FY2018	Source
Vehicle Service Miles	6,204,992	5,481,374	5,250,293	NTD S-10 TB
Total Vehicle Miles	6,495,233	5,799,472	5,556,424	NTD S-10 TB
Vehicle Service Hours	979,125	872,395	855,063	NTD S-10 TB
Total Vehicle Hours	1,015,187	911,972	892,578	NTD S-10 TB
Unlinked Passenger Trips	65,120,886	53,301,250	49,199,803	NTD S-10 TB
Farebox Revenue	\$50,655,640	\$40,995,246	\$39,538,150	NTD F-10
Total Operating Costs	\$175,178,172	\$165,409,220	\$175,643,075	NTD F-30 TB
Passenger Miles	97,410,860	79,086,719	67,071,940	NTD S-10 TB
Vehicle Operations Costs	\$90,384,377	\$89,512,653	\$96,808,043	NTD F-30 TB
Total Operator Time (Hours)	1,275,267	1,237,645	1,227,509	SFMTA Staff (Trapeze)
Operator Scheduled Absences (Hours)	138,884	135,584	125,723	SFMTA Staff (Trapeze)
Operator Unscheduled Absences (Hours)	61,927	59,935	50,729	SFMTA Staff (Trapeze)
Trips On-Time	65%	63%	62%	SFMTA Staff (AVL)
Complaints	3,700	3,549	2,910	SFMTA Staff (PSRs)
Missed Trips	0.44%	1.00%	1.96%	SFMTA Staff (Trapeze)
Mechanic Pay Hours	164,885	163,363	155,344	Payroll
Total Maintenance Employee Time (Hours)	278,748	294,852	295,164	NTD R-10
Maint. Employee Sched. Absences (Hours)	30,967	32,736	32,390	Payroll
Maint. Employee Unsched. Absences (Hours)	12,344	13,391	12,535	Payroll
Vehicle Maintenance Costs	\$31,248,678	\$32,013,560	\$27,107,514	NTD F-30 TB
Non-Vehicle Maintenance Costs	\$19,074,950	\$17,358,857	\$15,030,124	NTD F-30 TB
Spare Vehicles (Total less Maximum Service)	131	65	108	NTD S-10 TB
Total Vehicles	327	262	294	NTD S-10 TB
Revenue Vehicle Mechanical System Failures - Total	1,831	1,493	1,026	NTD R-20
Revenue Vehicle Mechanical System Failures - Major	1,572	1,063	929	NTD R-20
Preventable Accidents	193	195	230	TransitSafe_Incident Management System database
Casualty/Liability Costs	\$4,718,089	-\$899,267	\$6,275,401	NTD F-30 TB
Lost Hours - Industrial Accidents	18,315	13,585	6,169	OSHA Report

## Functional Performance Inputs – Light Rail/Historic Trolley

Data Item	FY2016	FY2017	FY2018	Source
Car Service Miles	5,691,158	6,296,563	5,782,528	NTD S-10 LR/SR
Total Car Miles	5,699,575	6,303,936	5,862,401	NTD S-10 LR/SR
Car Service Hours	633,736	696,396	652,845	NTD S-10 LR/SR
Total Car Hours	636,646	700,971	663,018	NTD S-10 LR/SR
Unlinked Passenger Trips	59,580,128	58,465,020	57,309,366	NTD S-10 LR/SR
Farebox Revenue	\$46,345,645	\$44,966,824	\$46,055,190	NTD F-10
Total Operating Costs	\$235,597,442	\$237,569,785	\$252,428,452	NTD F-30 LR/SR
Passenger Miles	152,591,220	150,072,285	147,452,458	NTD S-10 LR/SR
Vehicle Operations Costs	\$73,990,862	\$78,032,260	\$87,602,447	NTD F-30 LR/SR
Total Operator Time (Hours)	672,219	709,128	734,978	SFMTA Staff (Trapeze)
Operator Scheduled Absences (Hours)	78,042	79,637	82,240	SFMTA Staff (Trapeze)
Operator Unscheduled Absences (Hours)	32,236	35,776	29,200	SFMTA Staff (Trapeze)
Trips On-Time	50%	43%	43%	SFMTA Staff (AVL)
Complaints	2,126	2,183	1,941	SFMTA Staff (PSRs)
Missed Trips	1.86%	1.10%	2.32%	SFMTA Staff (Trapeze)
Mechanic Pay Hours	312,452	320,439	319,387	Payroll
Total Maintenance Employee Time (Hours)	608,666	668,478	703,152	NTD R-10
Maint. Employee Sched. Absences (Hours)	79,777	81,721	80,170	Payroll
Maint. Employee Unsched. Absences (Hours)	30,200	30,703	29,772	Payroll
Vehicle Maintenance Costs	\$86,924,988	\$77,318,488	\$87,265,231	NTD F-30 LR/SR
Non-Vehicle Maintenance Costs	\$35,994,317	\$39,237,795	\$33,487,983	NTD F-30 LR/SR
Spare Cars (Total less Maximum Service)	44	30	48	NTD S-10 LR/SR
Total Cars	199	185	217	NTD S-10 LR/SR
Revenue Vehicle Mechanical System Failures - Total	6,618	6,022	3,661	NTD R-20
Revenue Vehicle Mechanical System Failures - Major	1,214	1,340	1,285	NTD R-20
Preventable Accidents	40	65	56	TransitSafe_Incident Management System database
Casualty/Liability Costs	\$4,391,110	-\$1,033,006	\$6,480,251	NTD F-30 LR/SR
Lost Hours - Industrial Accidents	11,348	10,046	5,034	OSHA Report

## Functional Performance Inputs – Cable Car

Data Item	FY2016	FY2017	FY2018	Source
Car Service Miles	258,452	264,247	298,274	NTD S-10 CC
Total Car Miles	264,929	270,705	304,712	NTD S-10 CC
Car Service Hours	139,238	147,083	145,396	NTD S-10 CC
Total Car Hours	140,855	148,695	147,006	NTD S-10 CC
Unlinked Passenger Trips	5,800,222	6,224,072	6,292,346	NTD S-10 CC
Farebox Revenue	\$29,151,263	\$27,016,038	\$26,834,155	NTD F-10
Total Operating Costs	\$62,057,044	\$66,854,982	\$68,022,089	NTD F-30 CC
Passenger Miles	7,234,372	7,814,503	7,880,988	NTD S-10 CC
Vehicle Operations Costs	\$30,702,018	\$31,768,351	\$34,515,307	NTD F-30 CC
Total Operator Time (Hours)	378,897	379,253	378,610	SFMTA Staff (Trapeze)
Operator Scheduled Absences (Hours)	45,349	46,054	44,597	SFMTA Staff (Trapeze)
Operator Unscheduled Absences (Hours)	17,892	17,385	17,692	SFMTA Staff (Trapeze)
Trips On-Time	(a)	(a)	(a)	SFMTA Staff (AVL)
Complaints	249	206	105	SFMTA Staff (PSRs)
Missed Trips	1.14%	0.63%	0.90%	SFMTA Staff (Trapeze)
Mechanic Pay Hours	\$50,180	\$61,289	\$55,993	Payroll
Total Maintenance Employee Time (Hours)	\$103,821	\$133,526	\$133,587	NTD R-10
Maint. Employee Sched. Absences (Hours)	\$11,820	\$15,449	\$17,153	Payroll
Maint. Employee Unsched. Absences (Hours)	\$6,069	\$6,154	\$5,341	Payroll
Vehicle Maintenance Costs	\$9,070,004	\$10,654,702	\$10,350,011	NTD F-30 CC
Non-Vehicle Maintenance Costs	\$11,165,985	\$12,226,401	\$11,462,901	NTD F-30 CC
Spare Cars (Total less Maximum Service)	13	13	13	NTD S-10 CC
Total Cars	40	40	40	NTD S-10 CC
Revenue Vehicle Mechanical System Failures - Total	2,034	(a)	912	NTD R-20
Revenue Vehicle Mechanical System Failures - Major	57	(a)	273	NTD R-20
Preventable Accidents	8	18	11	TransitSafe_Incident Management System database
Casualty/Liability Costs	\$196,519	-\$43,351	\$334,264	NTD F-30 CC
Lost Hours - Industrial Accidents	3,821	3,666	3,876	OSHA Report

(a) Not available

## Functional Performance Inputs – Paratransit

Data Item	FY2016	FY2017	FY2018	Source
Vehicle Service Miles	1,745,564	1,968,208	1,826,069	NTD S-10 DR
Total Vehicle Miles	2,124,961	2,393,760	2,348,366	NTD S-10 DR
Vehicle Service Hours	260,072	259,756	259,338	NTD S-10 DR
Total Vehicle Hours	301,761	303,471	307,859	NTD S-10 DR
Unlinked Passenger Trips	479,290	475,786	445,651	NTD S-10 DR
Farebox Revenue	\$1,087,094	\$1,091,770	\$1,227,070	NTD F-10
Total Operating Costs	\$18,772,080	\$20,609,984	\$21,304,500	NTD F-30 DR
Passenger Miles	2,888,816	2,935,485	2,776,611	NTD S-10 DR
Vehicle Operations Costs	\$14,223,354	\$15,633,829	\$16,129,876	NTD F-30 DR/Database
Trips On-Time	424,603	416,265	381,878	Para Software Sys. Rpts
Total Trips	495,901	486,111	452,144	Para Yr-End Monthly Rpts
Complaints	741	728	717	Para Yr-End Monthly Rpts
Missed Trips	2,282	2,833	3,490	Para Software Sys. Rpts
Total ADA Trips	479,290	475,786	445,651	Para Software Sys. Rpts
ADA Trip Denials	0	0	0	Para Software Sys. Rpts
Trip Cancellations	69,908	67,952	70,749	Para Software Sys. Rpts
Late Trip Cancellations	20,010	15,374	15,175	Para Software Sys. Rpts
No Shows	14,207	16,632	19,648	Para Software Sys. Rpts
Vehicle Maintenance Costs	\$1,594,594	\$1,752,000	\$1,806,800	NTD F-30 DR/Database
Non-Vehicle Maintenance Costs	\$130,371	\$143,255	\$144,049	NTD F-30 DR/Database
Spare Vehicles	33	19	20	NTD S-10 DR
Total Vehicles	165	151	159	NTD S-10 DR
Rev Veh Mech System Failures - Total	93	158	120	NTD R-20
Rev Veh Mech System Failures - Major	52	112	108	NTD R-20
FTA Reportable Accidents	4	0	3	Para Yr-End Monthly Rpts