

Triennial Performance Audit

of the

Santa Clara Valley Transportation Authority (VTA)

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

FINAL AUDIT REPORT

prepared for the



**METROPOLITAN
TRANSPORTATION
COMMISSION**

by



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Management Consulting

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NOTE:

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

EXECUTIVE SUMMARY

This executive summary highlights the findings from the performance audit of the Santa Clara Valley Transportation Authority (VTA). 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. The four service modes operated by VTA, bus, light rail, rail shuttle and paratransit, are the prime focus of this performance audit. 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 is being conducted for MTC in accordance with its established procedures for performance audits. The 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 VTA'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 VTA's performance based on the results of the previous sections.

Comments received from VTA and MTC staff have been incorporated into this 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 VTA 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. VTA is in compliance with the definition and methodology for collection and reporting of TDA statistics, although data reporting anomalies were noted during the audit review.

- Some data reporting anomalies were found in the light rail and paratransit services. In the light rail service, employee full-time equivalents (FTEs) exhibited a significant increase between FY2015 and FY2016, with no corresponding increase in service hours or miles. At the same time, operating costs increased substantially. This was attributed to the mid-life overhaul of the light rail fleet, which VTA completed with in-house labor after determining it was the most cost-effective way to complete the project.
- There were paratransit service reporting anomalies for vehicle service hours (VSH) and vehicle service miles (VSM) in each year of the current audit period. This was attributed to a combination of decreasing ridership, the prior paratransit contractor self-reporting paratransit data and not tracking ridership, service hours and miles consistent with the current reporting methodology, and the transition to a new paratransit contractor.
- While VTA was able to provide the majority of the data requested for this audit, the accuracy of some of the data reported may be questionable or is missing. This resulted from VTA's terminating its contract with the prior paratransit service provider, Outreach & Escort, Inc. (O&E), in November 2016. VTA then entered into an emergency procurement with MV Public Transportation, Inc. (MVT) for temporary provision of paratransit services. MVT later was awarded the current paratransit contract. The transition from O&E to MVT disrupted the data collection process for paratransit service, and VTA implemented a new data reporting methodology with the

transition to the new contractor. Data tracking and reporting has improved and become more consistent with the transition to the new paratransit contractor.

Performance Indicators and Trends – VTA’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.

- Bus Service – 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 0.5 percent, decreasing 2.4 percent in inflation adjusted dollars. Cost per hour decreased in two of the six years examined.
 - The cost per passenger increased on average by 5.9 percent per year, which amounted to an average annual increase of 2.9 percent in constant FY2013 dollars.
 - Passenger productivity decreased due to overall lower ridership, with passengers per vehicle service hour decreasing 5.1 percent and passengers per vehicle service mile decreasing 4.5 percent per year overall.
 - Employee productivity was down slightly, decreasing an average one percent per year.

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

- Labor and benefit costs represented the largest portion of the total costs, representing about 80 percent in all six years. Labor costs increased an average of approximately five percent annually, while fringe benefit costs remained almost unchanged.
- There were modest changes in most component cost categories, with average annual increases of five percent or less in five of the seven cost categories examined.

- Services, fuel, and materials/supplies contributed about 15 percent of total costs, while the remaining categories contributed two percent or less to total costs over the six year period.
- Light Rail Service – The following is a brief summary of the TDA performance trend highlights over the six-year period of FY2013 through FY2018:
 - Cost efficiency declined, with an average annual increase in the operating cost per hour of 10.9 percent (7.8 percent in inflation adjusted dollars). Annual operating costs rose by an average of 13.3 percent annually, with a much smaller average annual increase in service delivery.
 - The operating cost per passenger averaged an annual increase of 18.7 percent, which amounted to a 15.4 percent increase when normalized in FY2013 dollars.
 - Passenger productivity worsened, with passengers per hour decreasing 6.6 percent per year on average and passengers per mile decreasing 5.2 percent annually on average over the six-year period.
 - Employee productivity increased overall during the period, mainly due to steady increases in FTEs during the current audit period.

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

- There were consistent, significant increases in total costs over the audit period, with an average annual increase of 13.3 percent.
- Costs increased in every cost category, with average double digit cost increases in five of the seven cost categories each year. Cost increases were highest during the current audit period (FY2016 through FY2018).
- The increase in costs is attributed to the mid-life maintenance overhaul of the light rail fleet, a project which VTA chose to complete in-house, rather than outsource, due to projected cost savings.

- The labor and fringe benefits costs contributed between 65 and 70 percent of total hourly costs.
- The share of total operating cost for services and materials/supplies increased their share of total costs during the period to about 14 percent and 16 percent, respectively. The remaining cost component categories contributed less than 10 percent in total.
- Rail Shuttle Service – The following is a brief summary of the TDA performance trend highlights over the six-year period of FY2013 through FY2018:
 - Cost efficiency declined overall, with an average annual increase in the operating cost per hour of 4.7 percent (1.8 percent in inflation adjusted dollars). Steady annual increases in operating costs and lower service levels influenced this indicator.
 - The operating cost per passenger averaged an annual decrease of 1.3 percent, or 4.1 percent in normalized FY2013 dollars. Passenger levels increased by almost 5 percent per year over the period, while operating costs increased only 3.1 percent per year.
 - Passenger productivity improved, with passengers per hour increasing about six percent and passengers per mile increasing over seven percent per year on average.

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

- Purchased transportation costs, the largest component cost category at almost 90 percent of total costs, increased by 2.6 percent per year on average, similar to the overall 3.1 percent annual increase in operating costs.
- Costs in all other categories also increased between two and 22 percent per year, but those cost categories comprise only 10 to 12 percent of the total hourly costs.
- Paratransit – The following is a brief summary of the TDA performance

trend highlights over the six-year period of FY2013 through FY2018:

- Cost efficiency improved overall, with an average annual decrease in the operating cost per hour of three percent (5.7 percent in inflation adjusted dollars).
- The operating cost per passenger averaged an annual increase of 6.1 percent, or 3.1 percent when normalized in FY2013 dollars. On average, operating costs decreased by 0.6 percent per year over the period, while ridership decreased by 6.2 percent per year.
- Passenger productivity was down, with passengers per hour decreasing an average 8.5 percent annually and passengers per mile decreasing 4.8 percent per year on average.
- As noted previously in this report, there were some reporting anomalies concerning paratransit vehicle service hours and miles during the current audit period. Those anomalies were attributed to a combination of decreasing ridership, inconsistencies in data collection and reporting by the prior paratransit contractor, and incomplete data resulting from the emergency changeover from the prior contractor to the current paratransit contractor in FY2017.

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

- Purchased transportation costs, by far the largest component cost category, remained relatively unchanged overall, increasing by 0.4 percent per year on average.
- Significant overall cost reductions occurred in other categories, with labor costs decreasing about 17 percent and services decreasing almost 60 percent per year on average.
- Other categories such as materials/supplies, casualty/liability and miscellaneous cost categories dropped to zero by FY2018, due to VTA establishing a new Indirect Cost Allocation Plan (ICAP), during the prior TDA audit period, that reallocated paratransit costs to other modes.

Compliance with Statutory Requirements – VTA is in compliance with the sections of the state PUC that were reviewed as part of this performance audit. These sections included CHP terminal safety inspections, requirements concerning labor contracts, part-time staffing, reduced fares, welfare to work coordination, revenue sharing, and evaluating passenger needs.

Status of Prior Audit Recommendations – There were three recommendations made in VTA’s prior performance audit. VTA has implemented corrective actions for all three recommendations from the prior audit.

- In response to the first recommendation for VTA to improve on-time performance, VTA implemented improvements to driver training and instruction programs for bus operators. For light rail, VTA completed several construction projects that had been hindering schedule adherence, and focused on signal priority for light rail. The results of VTA’s efforts included a 0.7 percent overall improvement in bus on-time performance and a 9.3 percent improvement for light rail during the current audit period.
- The second recommendation was to address the negative performance trends in service reliability for both bus and light rail service. VTA is adhering to a consistent preventive maintenance schedule for bus operations, and has been placing more new buses into service, and retiring older buses. VTA added light rail maintenance employees to assist in completing required maintenance on its vehicles, and has completed a required mid-life overhaul maintenance for the majority of its light rail fleet. The result of VTA’s efforts has been an almost 20 percent improvement in mean distance between major failures, and a 16 percent improvement in mean distance between all mechanical failures for bus service, and the mean distance between mechanical failures for light rail improved by 1.2 percent overall during the current audit period.
- In response to the third recommendation to address the increase in lost days due to industrial accidents for the light rail service, VTA expanded its employee Health and Wellness Program, expanded the employee safety program to conduct regular safety inspections and monthly safety

meetings, and added safety to the supervisor training program. VTA also is tracking long-term disability claims and is providing additional resources to re-integrate employees back into the work force. VTA's efforts have resulted in a 66 percent reduction in lost days due to industrial injuries and accidents for light rail during the current audit period.

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

- Systemwide – The following is a brief summary of the systemwide functional trend highlights between FY2016 and FY2018:
 - Administrative costs ranged between about 12 and 14 percent of total operating costs, averaging between \$23 and \$29 per vehicle service hour.
 - Marketing costs averaged between three and four percent of total administrative costs, while the marketing cost per passenger trip ranged from three to six cents each year.
 - Systemwide farebox recovery ratio decreased from 11 to nine percent during the audit period.
- Bus Service – The following is a brief summary of the bus service functional trend highlights between FY2013 and FY2015:
 - Service Planning results were mixed overall, as total operating cost per passenger mile increased by 48 percent, reflecting increased costs and lower passenger miles. Vehicle miles and hours in service remained steady at about 84 and 92 percent, respectively, but bus fare recovery ratio decreased 12 percent.
 - In Operations, vehicle operations cost increased slightly as a percentage of total operating cost, while vehicle operations cost per service hour increased about 7.5 percent from \$97.41 to \$104.79. Operator scheduled absences remained steady, while unscheduled

absences increased about five percent. Schedule adherence remained steady at about 86 percent, while there was an almost 11 percent decrease in passenger complaints per 100,000 boardings. There were very small numbers of passenger commendations and missed trips in all three years.

- Maintenance results found total maintenance costs holding steady at around 27 percent of total operating cost. Vehicle maintenance costs per mile increased just over five percent, while the ratio of mechanic pay hours to vehicle service hours decreased five percent. Scheduled employee absences increased four percent during the audit period, while unscheduled absences increased about 18 percent. Spare ratio decreased from 22 to just under 19 percent. Service reliability improved with mean distance between failures increasing more than 15 percent for both major and total failures during the audit period.
- Safety results demonstrated miles between preventable accidents decreasing slightly overall. A significant increase occurred in casualty and liability costs per service mile and hour during the period, and lost days due to industrial accidents increased almost 30 percent.
- Light Rail – The following is a brief summary of the light rail functional trend highlights between FY2016 and FY2018:
 - Service Planning results revealed both vehicle miles and hours in service of about 92 percent of total hours. There was a 62 percent increase in the cost per passenger mile, reflecting a trend of increasing costs and decreasing ridership. Farebox recovery ratio decreased from ten percent to six percent.
 - Operations results included a decrease in vehicle operations cost as a percentage of total operating cost, but a 19 percent increase in vehicle operations costs per service hour. Operator scheduled absences were almost unchanged, but unscheduled absences increased just over seven percent overall. Schedule adherence improved 9.3 percent over the audit period from 77.5 to 84.7 percent. Passenger complaints decreased 17 percent during the period from

16.8 to 14 per 100,000 boardings. There were very few passenger commendations and missed trips during the audit period.

- In Maintenance, total maintenance costs rose five percent as a percentage of total operating cost. Vehicle maintenance costs per service mile increased 56 percent, reflecting increased costs and reduced service levels. The ratio of mechanic pay hours to car service hours increased two percent. Employee scheduled absences were almost unchanged while unscheduled absences decreased almost nine percent over the audit period. The vehicle spare ratio decreased about five percent and the mechanical failure rate improved by 1.2 percent overall.
- For Safety, preventable accidents per 100,000 remained unchanged during the audit period. Casualty and liability costs per service hour and service mile increased significantly, by about 186 percent and 203 percent overall, respectively. Lost days due to industrial accidents decreased by 66 percent during the audit period, the result of VTA implementing a recommendation from the prior audit.
- Rail Shuttle – The following is a brief summary of the rail shuttle functional trend highlights between FY2016 and FY2018:
 - Service Planning results showed minor reductions in performance in vehicle miles and hours in service. Total operating cost per passenger mile decreased about five percent overall.
 - Operations exhibited about a ten percent increase in vehicle operations costs as a percentage of total operating cost. Vehicle operations cost per service hour increased about five percent. There were very few complaints and commendations per 10,000 passengers throughout the audit period. Data for on-time performance and missed trips was unavailable. The shuttle contractor is responsible for shuttle operations and does not track that data, as it is heavily influenced by the ACE commuter rail service schedules and performance.
 - Maintenance results revealed vehicle maintenance costs decreased as a percentage of total costs, as did maintenance cost per vehicle service mile. The spare ratio was mostly stable, remaining at less

than nine percent throughout the period. There was significant improvement in mechanical failure rates.

- VTA did not report any preventable accidents during the current audit period.
- Paratransit – The following is a brief summary of the paratransit functional trend highlights between FY2016 and FY2018:
 - Service Planning results were mixed, with total operating cost per passenger mile decreasing slightly during the audit period, performance in vehicle miles and hours in service declining by about three and ten percent, respectively, and farebox recovery ratio decreasing from 12 percent to 9.6 percent.
 - Operations results included about a 28 percent decrease in vehicle operations cost as a percentage of total costs, and the cost per service hour decreasing by almost 31 percent. Schedule adherence dipped slightly from about 91 percent to 88 percent, but complaints per 10,000 passengers more than tripled from 6.8 to 24.7 per year. There were no ADA trip denials reported and less than one percent of missed trips per total trips were reported during the audit period. Late trip cancellations and passenger no-shows as a percentage of total ADA trips both increased significantly over the audit period, from less than one percent in FY2016 to 1.7 and three percent respectively. VTA did not report data for total trip cancellations per total number of ADA trips provided during the audit period.
 - Maintenance results showed vehicle maintenance costs increasing over the audit period, with maintenance costs rising from four percent to 10.2 percent of total operating costs, and vehicle maintenance cost per service mile doubling from \$0.17 to \$0.34. The spare ratio increased significantly from 1.3 to 33.5 percent, and there also was significant improvement in mechanical failure rates. The increase in maintenance costs and vehicle spare ratio were likely influenced by the emergency change in paratransit contractors in FY2017.

- VTA does not track preventable accident data, as the paratransit contractor is liable for all accidents that occur in the paratransit service.

Recommendations

1. ADDRESS THE SIGNIFICANT INCREASE IN CASUALTY/LIABILITY COSTS FOR THE FIXED-ROUTE BUS AND LIGHT RAIL SERVICE.

[Reference Sections: III. TDA Performance Indicators and Trends; VI. Functional Performance Indicator Trends]

The review of fixed-route bus and light rail component costs found significant increases in casualty/liability expenses for both divisions. Casualty/liability costs for bus increased an annual average of 20.5 percent, while light rail casualty/liability costs increased an average of 36.8 percent annually during the six-year period. The cost increases caused significant increases in the cost per service hour and service mile for both bus and light rail service.

VTA should investigate the reasons for the increase in casualty/liability costs for the bus and light rail divisions and develop strategies to reduce the causes for the increased costs.

2. EXAMINE THE INCREASE IN LOST DAYS DUE TO INDUSTRIAL ACCIDENTS FOR THE FIXED-ROUTE BUS SERVICE.

[Reference Section: VI. Functional Performance Indicator Trends]

The number of days reported lost due to industrial accidents for the fixed-route service has increased from 3,695 days in FY 2016 to 4,793 days in FY2018, an increase of almost 30 percent over the audit period.

VTA should investigate the reasons for the increase in lost days due to industrial accidents and develop a plan to reduce that number in the bus division, similar to the light rail division's efforts during the current audit period.

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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 Santa Clara Valley Transportation Authority (VTA). Four modes operated by VTA (bus, light rail, rail shuttles and paratransit) are the prime focus of this performance audit. VTA also co-sponsors commuter rail services and intercounty express bus services, with various other agencies. The audit period is Fiscal Years 2016 through 2018 (from July 1, 2015 through June 30, 2018).

An overview of VTA is provided in Exhibit 1. This is followed by an organization chart in Exhibits 2.1 and 2.2, which reflects the basic organizational structure during the audit period.

Performance Audit and Report Organization

This performance audit of VTA is being conducted for MTC in accordance with its established procedures for performance audits. The audit consists of two discrete steps:

1. Compliance Audit - Activities in this phase include:
 - 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 include:
 - A review of actions to implement the recommendations from the prior performance audit;
 - Calculation and evaluation of performance indicator trends; and
 - Findings, conclusions, and the formulation of recommendations.

This report presents the findings from both phases of the audit. Comments received from VTA and MTC staff will be incorporated into the final report.

Exhibit 1: System Overview

Location	3331 North First Street, San Jose, CA 95134
Establishment	Santa Clara County Transit District (SCCTD) was created in 1969 by the California state legislature. In 1974, the Santa Clara County Board of Supervisors created the Santa Clara County Transportation Agency (SCCTA) to provide administrative and management support for all County transportation functions. In January 1995, SCCTD merged with the County's Congestion Management Agency, to form the Santa Clara Valley Transportation Authority (VTA). VTA is an independent special district responsible for bus and light rail operations, congestion management, specific highway improvement projects and countywide transportation planning.
Board	The Board of Directors is composed of twelve voting members and six alternates, all elected officials appointed to represent the jurisdiction they represent as well as the County Board of Supervisors. Fifteen Directors are city council members and three are County supervisors. In addition, the three non-voting ex-officio members are the MTC Commissioners representing Santa Clara County. Board members serve two year terms.
Facilities	VTA owns an administration complex, three bus operating divisions (one including an overhaul and repair facility), and one light rail operating and maintenance facility. The LRT system has a total of 62 stations. VTA utilizes 16 transit centers and also operates 28 park-and-ride lots.
Service Data	<p>VTA provides bus, light rail, and paratransit service. VTA also sponsors a rail shuttle program, commuter rail service (Caltrain, Capitol Corridor and Altamont Commuter Express), and intercounty express bus service (Dumbarton Express, San Jose-Monterey Express, and Highway 17 Express).</p> <p>VTA provides fixed-route bus service on 71 routes, which includes 54 local/community routes and 17 express/limited stop routes. There is also free downtown Airport Flyer service. The majority of fixed-route service operates during weekday peak and midday periods. There currently are 497 buses in the active fleet.</p> <p>The light rail system is 42.2 miles long, utilizing 62 stations and uses a fleet of 99 active low-floor cars. There are three services: the Alum Rock-Santa Teresa Line, Mountain View-Winchester Line, and Almaden to Ohlone/Chynoweth. VTA also owns several historic trolleys for operation in downtown San Jose, but their operation is limited to weekends and special occasions.</p>

Currently, the adult base one-way fare is \$2.50 for regular buses and light rail, \$5.00 for Express services, \$1.25 for youths ages 5-17 and \$1.00 for seniors, people with disabilities and Medicare card holders. Transfers are free for 2 hours across VTA buses and light rail with single ride purchase through Clipper or EZfare. The senior/disabled/Medicare fares are valid on Express Bus service, and children under five years of age ride free. VTA also offers unlimited use monthly and annual passes.

The VTA-managed light rail/ACE shuttles currently charge no fares and are jointly financed through grant funds from the Bay Area Air Quality Management District (BAAQMD) and by local partners served by the shuttles. The shuttles connect downtown San Jose and major employment centers with VTA's light rail lines, as well as the ACE and Caltrain commuter rail lines. VTA operates most of the shuttles with some contracted to private vendors.

ADA paratransit service is provided through a contracted independent service provider, MV Public Transportation, Inc. The contractor conducts ADA eligibility certification and provides paratransit service delivery. The fare for a regular one-way paratransit trip is established at twice the one-way adult cash fare of VTA's fixed-route bus and light rail services (currently \$5.00). Personal care attendants ride at no charge.

Recent Changes

Changes within the past three years to VTA services include:

- Completion of the Santa Clara Pocket Tack and Double Crossover.
- Completion of the Alum Rock/Santa Clara Bus Rapid Transit (BRT) Project.
- Express bus service improvements along the Rapid 523 Route corridor have been completed.
- Service changes will begin with the opening of the Berryessa BART station.
- Completion of the Santa Clara Pedestrian Undercrossing. (Note: winner of Golden State Award and Silicon Valley Business Journal).
- Implementation of the Transit Sustainability Policy and Service Design Guidelines. Includes integration and connectivity with the planned BART expansion into Santa Clara County at the Milpitas station.
- Countywide Bicycle Plan Update.
- New VTA Mobile Ticketing Option.

Planned Changes

Planned and on-going VTA transit projects include:

- Eastridge to BART Regional Connector
- Fast Transit Program
- Light Rail Efficiency
- Light Rail Speed and Safety Enhancements
- North Central County Bus Improvement Plan
- Vasona Light Rail Extension Projects, and
- VTA's System Redesign (New Network)

Staff

VTA is organized into eight divisions plus the office of the General Manager. Current budgeted staffing by division for FY2018 is summarized below:

Office of the General Manager	2
Operations	1,880
Business Services	177
Administrative Services	90
Engineering & Program Delivery	96
Finance & Budget	80
Planning & Programming	53
External Affairs	5
Board Secretary	8
TOTAL	2,391

Exhibit 2.1: Organization Chart FY2016

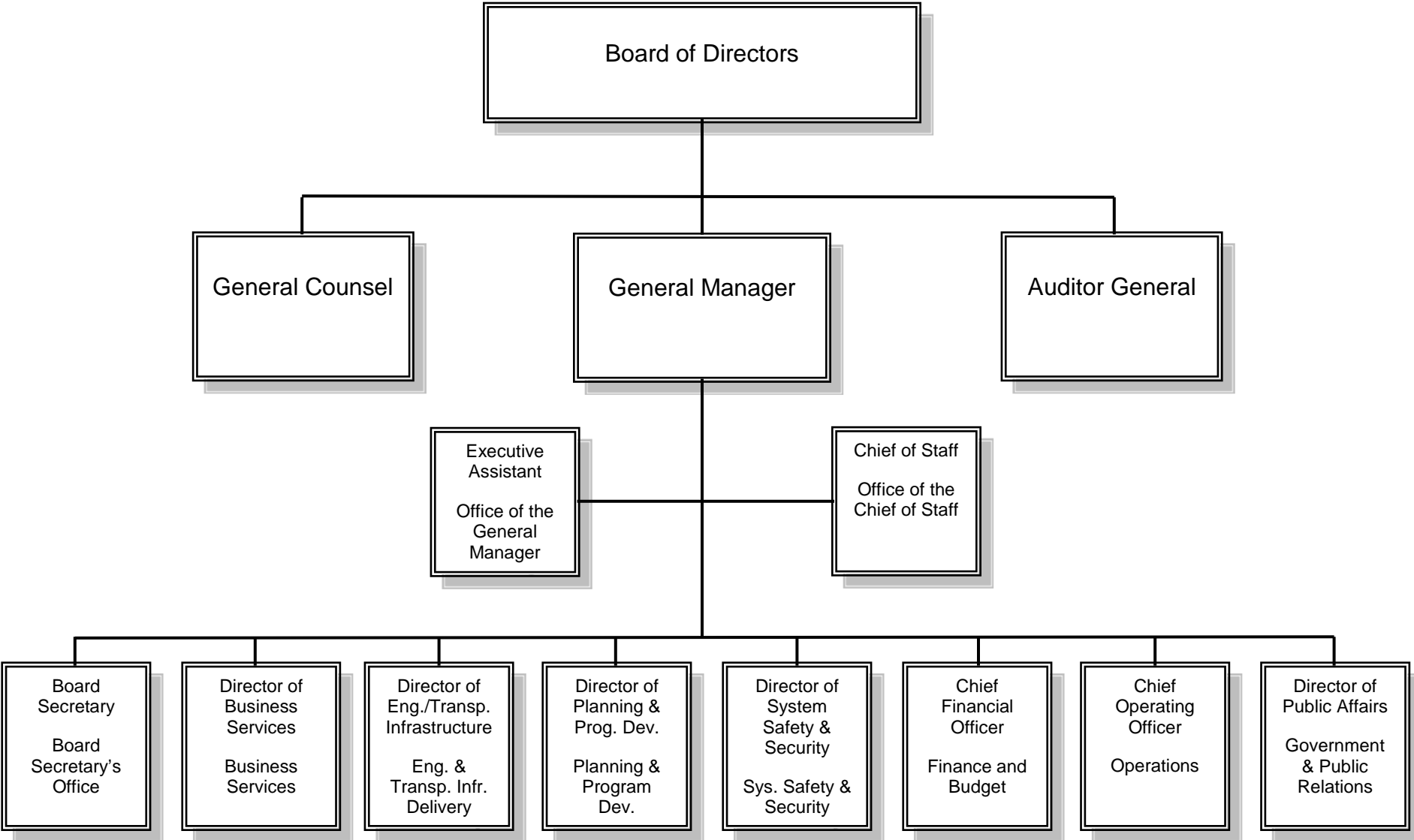


Exhibit 2.2: Organization Chart FY2017 – FY2018

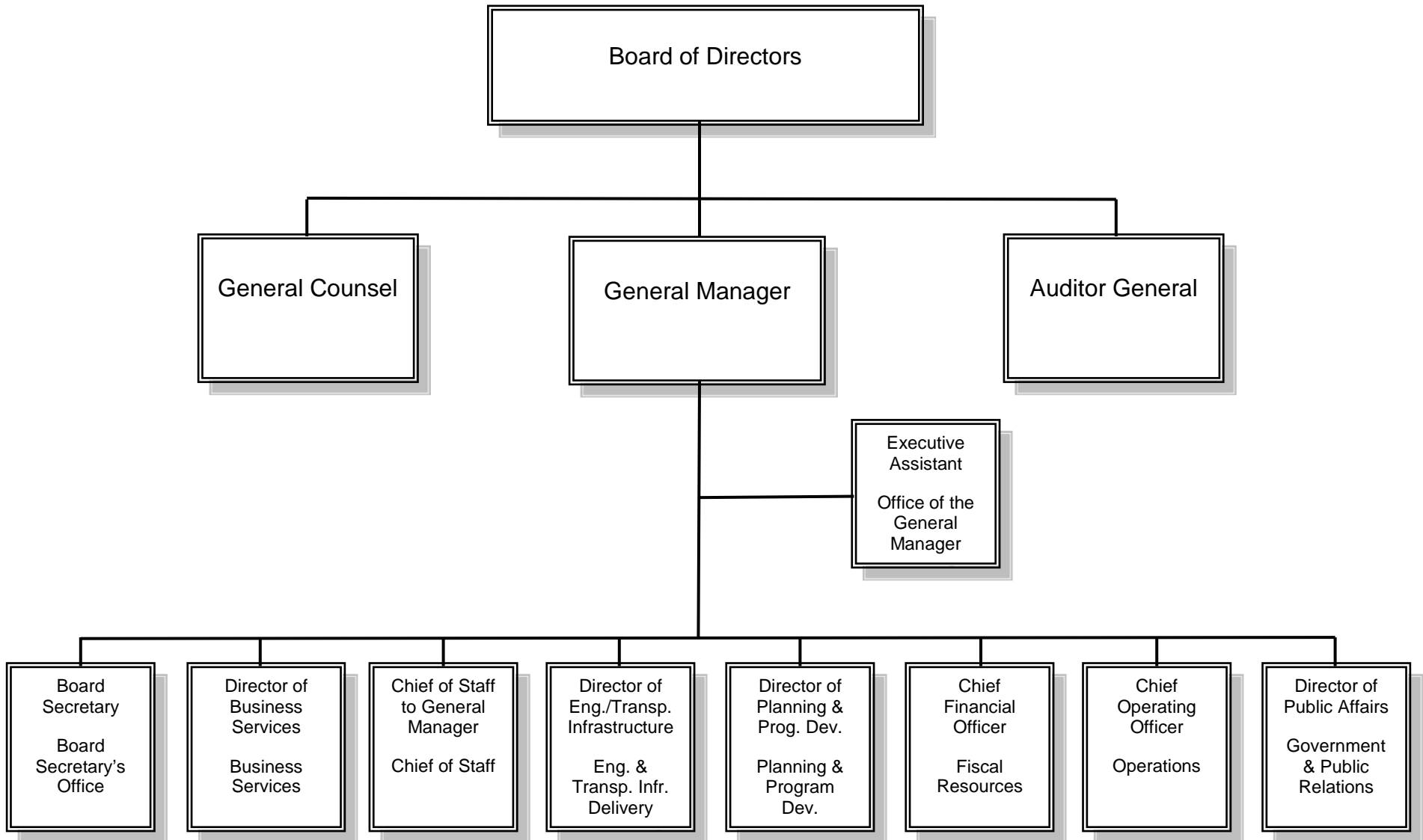
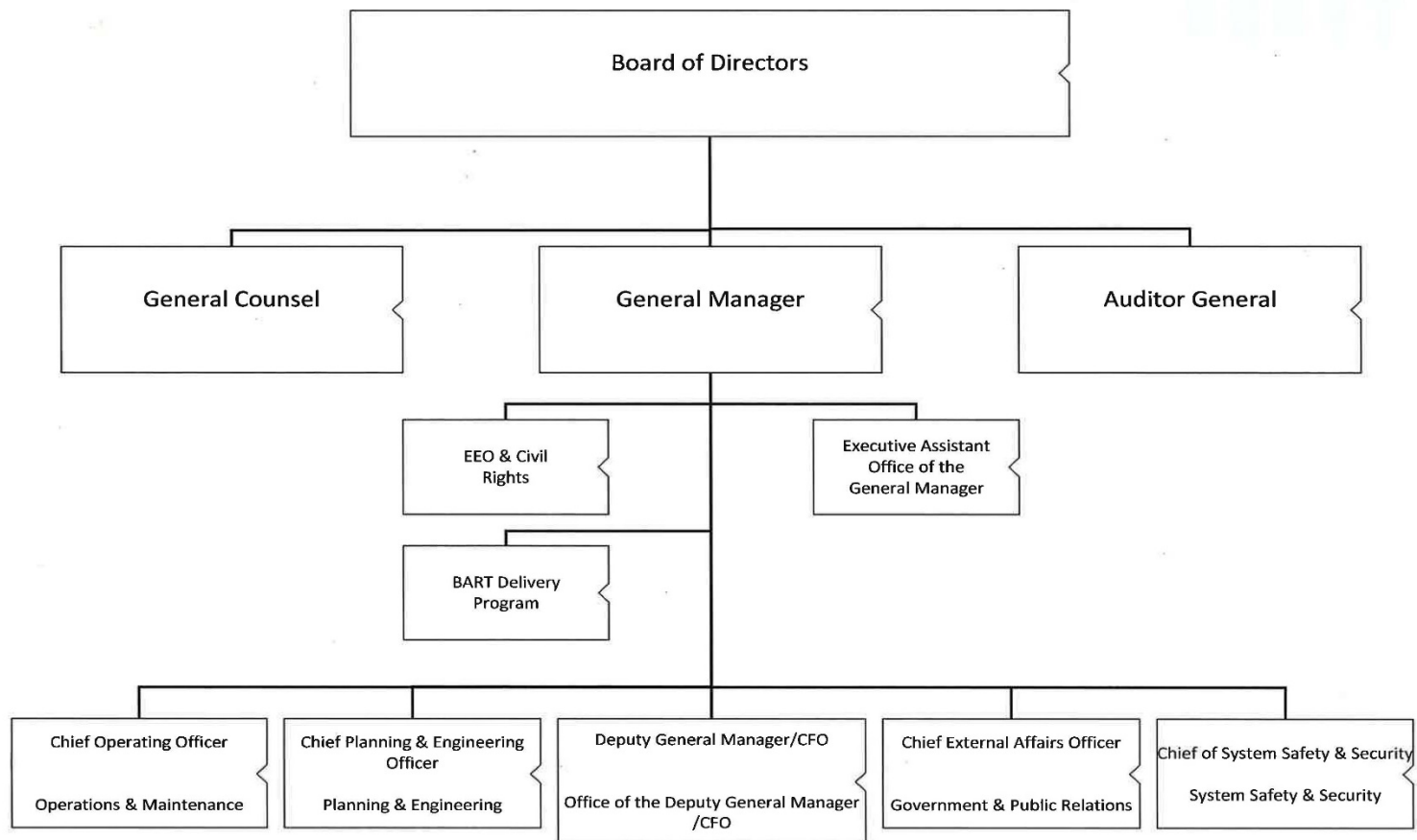


Exhibit 2.2: Organization Chart – Current



Organizational Structure as of April 2019

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 VTA 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 VTA covering the audit period has been reviewed. VTA's NTD reports include its bus, light rail, rail shuttle and paratransit (including demand taxi) services. However, consistent with FTA reporting requirements, VTA does not submit employee hour information for purchased transportation service to the NTD.

Compliance with Requirements

Two departments within VTA have the primary responsibility for collecting and reporting this information. The Fiscal Resources Division provides the cost-related information. The Operations Analysis Department is responsible for operating data such

as service hours, service miles, and passengers. Also data collection and reporting for paratransit service is coordinated between VTA and its contractor, MV Public Transportation, Inc. (MVT). The contractor is responsible for collecting and compiling data for the paratransit service.

To support this review, VTA also provided information to confirm and/or update its data collection and reporting procedures as described in the prior performance audit. 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, VTA is in compliance with the data collection and reporting requirements for all five TDA statistics, although some anomalies were noted during the audit review.

Consistency of the Reported Statistics

The TDA statistics for VTA's bus, light rail, rail shuttle and paratransit (including demand taxi) services are presented in Exhibits 3.2 through 3.5, respectively. 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 following is a brief summary of the results:

- VTA is in compliance with the definition and methodology for collection and reporting of TDA statistics.
- There is 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 tend to be relatively proportional to increases or decreases in annual vehicle service hours and miles.

- Some data reporting anomalies were found in the light rail and paratransit services. In the light rail service, employee full-time equivalents (FTEs) exhibited a significant increase between FY2015 and FY2016, with no corresponding increase in service hours or miles. At the same time, operating costs increased substantially. This was attributed to the mid-life overhaul of the light rail fleet, which VTA completed with in-house labor after determining that was the most cost-effective way to complete the project.
- There were paratransit service reporting anomalies for vehicle service hours (VSH) and vehicle service miles (VSM) in each year of the current audit period. This was attributed to a combination of decreasing ridership, the prior paratransit contractor self-reporting paratransit data and not tracking ridership, service hours and miles consistent with the current reporting methodology, and the transition to a new paratransit contractor.
- While VTA was able to provide the majority of the data requested for this audit, the accuracy of some of the data reported may be questionable or is missing. This resulted from VTA's terminating its contract with the prior paratransit service provider, Outreach & Escort, Inc. (O&E), in November 2016. VTA then entered into an emergency procurement with MV Public Transportation, Inc. (MVT) for temporary provision of paratransit services. MVT later was awarded the current paratransit contract. The transition from O&E to MVT disrupted the data collection process for paratransit service, and VTA implemented a new data reporting methodology with the transition to the new contractor. Data tracking and reporting has improved and become more consistent with the transition to the new paratransit contractor.

Exhibit 3: 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"> • Financial information is tracked by Fiscal Resources Division in accordance with NTD Uniform System of Accounts procedures. Operating cost reported in NTD is obtained from VTA’s general ledger system (SAP). • Financials are primarily driven by ridership demand and predetermined contractual revenue vehicle hour and taxi trip rates. VTA reports all contractor and internal related paratransit costs together as one. Revenue vehicle hours and passenger trip is provided by a computerized scheduling system.
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"> • Scheduled Hours are computed by the Trapeze FX application and updated quarterly when schedule changes are made. For routing changes, the new segments are mapped by a built-in component of the Trapeze FX application, and recorded into the system. • Operations Analysis calculates the actual hours of service operated. The amount of service hours missed is monitored daily. Service missed is based on road calls, outlates and incidents/ accidents. • The Actual Hours formula is: Scheduled Hours - Service Hours Missed + Special Trip Services Hours.

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"> Scheduled Miles are computed by the Trapeze FX application and updated quarterly when schedule changes are made. For routing changes, the new service hours are mapped by a built in component of the Trapeze FX application, and recorded into the system. Operations Analysis calculates the actual miles of service operated. The Percentage of Service Hours Operated factor is determined. This is calculated using the formula: $[1 - (\text{Service Hours Missed} / \text{Scheduled Hours})]$. The amount of service hours missed is monitored daily. Service missed is based on road calls, outlates and incidents/ accidents. The Actual Miles formula is: $(\text{Percentage of Service Hours Operated factor} * \text{Scheduled Miles}) + \text{Special Trip Services Miles}$.
Unlinked Passengers	“Unlinked passengers” means the number of boarding passengers, whether revenue producing or not, carried by the public transportation system.	In Compliance	<ul style="list-style-type: none"> Bus ridership is captured using the APC (Automatic Passenger Counter) System. Electronic counters are installed in approximately 68 percent of the active bus fleet. Light Rail ridership is similarly calculated through the use of Automatic Passenger Counters placed on 100 percent of the active light rail fleet. VTA follows a sampling methodology (for both bus & light rail) that is approved by the FTA. Paratransit ridership is based on computerized scheduling information and cross-checked by driver logs and MDT (Mobile Data Terminal) input; adjustments as needed are entered into the computer and tallied. This ridership is tracked by total passenger trips, including trips taken by ADA-paratransit eligible riders, their companions, and/or their personal care attendants. Information regarding shared trips and average weekday ridership is also tracked.

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"> • Employee Labor hours and Actual Person Count are maintained by Fiscal Resources (Payroll) and Administrative Services, respectively. • Labor hours are divided by 2000 to arrive at FTEs for TDA reporting purposes.

Exhibit 3.2: TDA Statistics – Bus Service

TDA Statistic	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018
Operating Cost (Actual \$)	\$224,474,914	\$236,593,312	\$238,661,160	\$242,711,833	\$248,477,183	\$258,487,093
<i>Annual Change</i>	- -	5.4%	0.9%	1.7%	2.4%	4.0%
Vehicle Service Hours	1,209,931	1,246,022	1,296,567	1,336,767	1,352,310	1,361,557
<i>Annual Change</i>	- -	3.0%	4.1%	3.1%	1.2%	0.7%
Vehicle Service Miles	14,582,508	14,817,700	15,247,087	15,518,418	15,712,632	15,889,222
<i>Annual Change</i>	- -	1.6%	2.9%	1.8%	1.3%	1.1%
Unlinked Passengers	32,404,598	32,475,527	32,623,832	32,195,504	29,057,047	28,048,405
<i>Annual Change</i>	- -	0.2%	0.5%	-1.3%	-9.7%	-3.5%
Employee Full-Time Equivalents	1,225.1	1,336.8	1,286.8	1,395.4	1,455.9	1,451.8
<i>Annual Change</i>	- -	9.1%	-3.7%	8.4%	4.3%	-0.3%

Sources: FY2013 through FY2015 - Prior Performance Audit Report
 FY2016 through FY2018 - NTD Reports, (2018 data preliminary; FTEs include operating labor only)

Exhibit 3.3: TDA Statistics – Light Rail Service

TDA Statistic	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018
Operating Cost (Actual \$)	\$68,972,255	\$74,694,030	\$81,316,886	\$92,428,467	\$106,017,010	\$128,622,203
<i>Annual Change</i>	- -	8.3%	8.9%	13.7%	14.7%	21.3%
Car Service Hours	198,429	218,744	221,769	218,459	217,434	220,589
<i>Annual Change</i>	- -	10.2%	1.4%	-1.5%	-0.5%	1.5%
Car Service Miles	3,208,060	3,391,181	3,518,983	3,470,427	3,349,372	3,314,903
<i>Annual Change</i>	- -	5.7%	3.8%	-1.4%	-3.5%	-1.0%
Unlinked Passengers	10,742,292	10,952,965	11,338,905	10,721,047	9,132,084	8,507,096
<i>Annual Change</i>	- -	2.0%	3.5%	-5.4%	-14.8%	-6.8%
Employee Full-Time Equivalents	312.6	400.5	305.1	440.6	444.6	476.5
<i>Annual Change</i>	- -	28.1%	-23.8%	44.4%	0.9%	7.2%

Sources: FY2013 through FY2015 - Prior Performance Audit Report
 FY2016 through FY2018 - NTD Reports, (2018 data preliminary; FTEs include operating labor only)

Exhibit 3.4: TDA Statistics – Rail Shuttle Service

TDA Statistic	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018
Operating Cost (Actual \$)	\$1,522,314	\$1,706,945	\$1,789,984	\$1,872,685	\$1,734,698	\$1,771,267
<i>Annual Change</i>	- -	12.1%	4.9%	4.6%	-7.4%	2.1%
Vehicle Service Hours	18,997	17,232	17,325	17,606	17,584	17,556
<i>Annual Change</i>	- -	-9.3%	0.5%	1.6%	-0.1%	-0.2%
Vehicle Service Miles	218,317	190,884	192,100	193,614	189,481	188,493
<i>Annual Change</i>	- -	-12.6%	0.6%	0.8%	-2.1%	-0.5%
Unlinked Passengers	341,369	383,118	417,040	428,666	407,032	424,941
<i>Annual Change</i>	- -	12.2%	8.9%	2.8%	-5.0%	4.4%
Employee Full-Time Equivalents	(a)	(a)	(a)	(a)	(a)	(a)
<i>Annual Change</i>	- -	- -	- -	- -	- -	- -

(a) - Not applicable as VTA Shuttle Bus service is provided by a private contractor

Sources: FY2013 through FY2015 - Prior Performance Audit Report

FY2016 through FY2018 - NTD Reports (2018 data preliminary)

Exhibit 3.5: TDA Statistics – Paratransit Service

TDA Statistic	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018
Operating Cost (Actual \$)	\$21,954,919	\$19,987,296	\$20,975,163	\$22,879,118	\$25,530,098	\$21,348,910
<i>Annual Change</i>	- -	-9.0%	4.9%	9.1%	11.6%	-16.4%
Vehicle Service Hours	287,569	285,273	280,707	337,134	323,425	324,888
<i>Annual Change</i>	- -	-0.8%	-1.6%	20.1%	-4.1%	0.5%
Vehicle Service Miles	5,995,466	6,196,213	5,922,864	4,929,806	5,126,725	5,544,166
<i>Annual Change</i>	- -	3.3%	-4.4%	-16.8%	4.0%	8.1%
Unlinked Passengers	732,793	727,688	717,675	651,679	541,444	530,726
<i>Annual Change</i>	- -	-0.7%	-1.4%	-9.2%	-16.9%	-2.0%
Employee Full-Time Equivalents	(a)	(a)	(a)	(a)	(a)	(a)
<i>Annual Change</i>	- -	- -	- -	- -	- -	- -

(a) - Not applicable as VTA paratransit service is provided by a private contractor

Sources: FY2013 through FY2015 - Prior Performance Audit Report

FY2016 through FY2018 - NTD Reports (2018 data preliminary)

III. TDA PERFORMANCE INDICATORS AND TRENDS

The performance trends for the VTA's bus, light rail, rail shuttle and paratransit service modes are presented in this section. Performance is discussed for each of the five TDA-mandated performance indicators:

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

The performance results in these indicators were developed from the information in the NTD reports filed with the FTA for the three years of the audit period. VTA's NTD reports were the source of all operating and financial statistics except for contractor FTEs. As noted in Section II: Review of TDA Data Collection and Reporting Methods, VTA contracts for its rail shuttle and paratransit services, and does not report FTE data for those services in its NTD reports. The operating contractors are responsible for staffing and employee productivity, therefore, contracted service FTE data and results are not included as part of this audit report.

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 VTA'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 VTA's performance trends in each of the five TDA performance indicators. The discussion is organized by service mode -- VTA's bus service is discussed first, followed by light rail, rail shuttles, and then paratransit. 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. This expanded analysis normally is not included for contracted services such as rail shuttles and paratransit, where the cost breakdowns are internal contractor issues; however, we have included them in this report to illustrate the trends in contracted cost categories.

Bus Service Performance Trends

This section provides an overview of the performance of VTA's bus 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)
 - Operating cost per vehicle service hour, a key indicator of cost efficiency, increased an average of 0.5 percent annually. This reflects the almost equal annual average increases in both operating costs and vehicle service hours over the six-year period.
 - The cost per hour ranged from \$185.53 in FY2013 to \$189.85 in FY2018, with decreases in cost per hour occurring in FY2015 and FY2016.
 - In constant FY2013 dollars, there was an average annual decrease in this indicator of 2.4 percent.

- Passengers per Vehicle Service Hour (Exhibit 4.2)
 - Passengers per vehicle service hour, an indicator of passenger productivity, decreased an average of 5.1 percent annually during the six-year period.
 - The decrease reflects decreasing ridership combined with an increase in service hours over the period.
 - Passengers per hour decreased overall from 26.8 in FY2013 to 20.6 in FY2018.

- Passengers per Vehicle Service Mile (Exhibit 4.2)
 - The six-year trend in passengers per vehicle service mile, another passenger productivity indicator, also decreased, by an annual average of 4.5 percent.
 - As with passengers per hour, this performance reflects the decreasing ridership and average annual increases in vehicle service miles.
 - There were 2.22 passengers per mile in FY2013, compared with 1.77 in FY2018.

- Operating Cost per Passenger (Exhibit 4.3)
 - A measure of cost effectiveness, VTA’s operating cost per passenger was \$6.29 in FY2013, increasing each year to \$9.22 per passenger in FY2018, or 5.9 percent annually.
 - Total operating costs increased modestly but ridership lagged, especially during the current audit period, decreasing by 2.8 percent per year on average.
 - With the impact of inflation removed (normalization), the six-year result was an average annual increase of 2.9 percent in the cost per passenger.
- Vehicle Service Hours per Employee (FTE) (Exhibit 4.4)
 - Employee productivity, measured as vehicle service hours per full-time employee, decreased by an average one percent per year over the six years.
 - Hours per FTE decreased overall from 988 in FY2013 to 938 in FY2018, with hours fluctuating up and down over the entire period.

* * * * *

The following is a brief summary of the bus service 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 0.5 percent, decreasing 2.4 percent in inflation adjusted dollars. Cost per hour decreased in two of the six years examined.
- The cost per passenger increased on average by 5.9 percent per year, which amounted to an average annual increase of 2.9 percent in constant FY2013 dollars.
- Passenger productivity decreased due to overall lower ridership, with passengers per vehicle service hour decreasing 5.1 percent and passengers per vehicle service mile decreasing 4.5 percent per year overall.

- Employee productivity was down slightly, decreasing an average one percent per year.

Exhibit 4: TDA Indicator Performance – Bus Service

	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Av. Ann. Chg.
Performance Indicators							
Op. Cost per Vehicle Svc. Hour (Actual \$)	\$185.53	\$189.88	\$184.07	\$181.57	\$183.74	\$189.85	- -
<i>Annual Change</i>	- -	2.3%	-3.1%	-1.4%	1.2%	3.3%	0.5%
Op. Cost per Vehicle Svc. Hour (Constant \$)	\$185.53	\$184.59	\$175.63	\$169.07	\$165.71	\$164.67	- -
<i>Annual Change</i>	- -	-0.5%	-4.9%	-3.7%	-2.0%	-0.6%	-2.4%
Passengers per Vehicle Service Hour	26.8	26.1	25.2	24.1	21.5	20.6	- -
<i>Annual Change</i>	- -	-2.7%	-3.5%	-4.3%	-10.8%	-4.1%	-5.1%
Passengers per Vehicle Service Mile	2.22	2.19	2.14	2.07	1.85	1.77	- -
<i>Annual Change</i>	- -	-1.4%	-2.4%	-3.0%	-10.9%	-4.5%	-4.5%
Op. Cost per Passenger (Actual \$)	\$6.93	\$7.29	\$7.32	\$7.54	\$8.55	\$9.22	- -
<i>Annual Change</i>	- -	5.2%	0.4%	3.1%	13.4%	7.8%	5.9%
Op. Cost per Passenger (Constant \$)	\$6.93	\$7.08	\$6.98	\$7.02	\$7.71	\$7.99	- -
<i>Annual Change</i>	- -	2.2%	-1.4%	0.6%	9.9%	3.7%	2.9%
Vehicle Service Hours per FTE	988	932	1,008	958	929	938	- -
<i>Annual Change</i>	- -	-5.6%	8.1%	-4.9%	-3.0%	1.0%	-1.0%
Input Data							
Operating Cost (Actual \$)	\$224,474,914	\$236,593,312	\$238,661,160	\$242,711,833	\$248,477,183	\$258,487,093	- -
<i>Annual Change</i>	- -	5.4%	0.9%	1.7%	2.4%	4.0%	2.9%
Operating Cost (Constant \$)	\$224,474,914	\$230,006,599	\$227,714,466	\$226,006,722	\$224,085,653	\$224,202,516	- -
<i>Annual Change</i>	- -	2.5%	-1.0%	-0.7%	-0.9%	0.1%	0.0%
Vehicle Service Hours	1,209,931	1,246,022	1,296,567	1,336,767	1,352,310	1,361,557	- -
<i>Annual Change</i>	- -	3.0%	4.1%	3.1%	1.2%	0.7%	2.4%
Vehicle Service Miles	14,582,508	14,817,700	15,247,087	15,518,418	15,712,632	15,889,222	- -
<i>Annual Change</i>	- -	1.6%	2.9%	1.8%	1.3%	1.1%	1.7%
Unlinked Passengers	32,404,598	32,475,527	32,623,832	32,195,504	29,057,047	28,048,405	- -
<i>Annual Change</i>	- -	0.2%	0.5%	-1.3%	-9.7%	-3.5%	-2.8%
Employee Full-Time Equivalents	1,225.1	1,336.8	1,286.8	1,395.4	1,455.9	1,451.8	- -
<i>Annual Change</i>	- -	9.1%	-3.7%	8.4%	4.3%	-0.3%	3.5%
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%

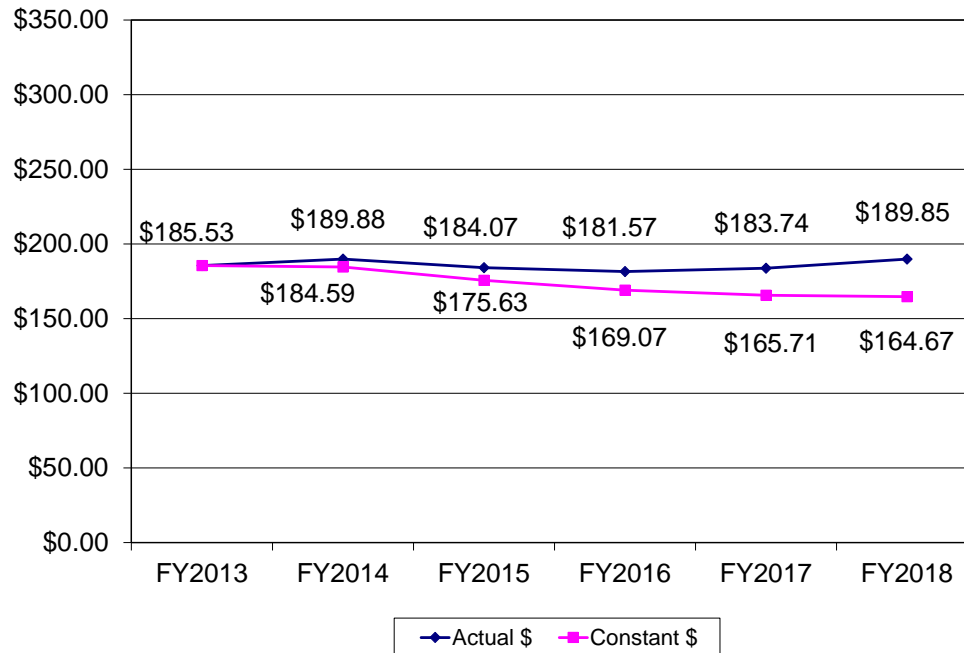
Sources:

FY2013 through FY2015 - Prior Performance Audit Report

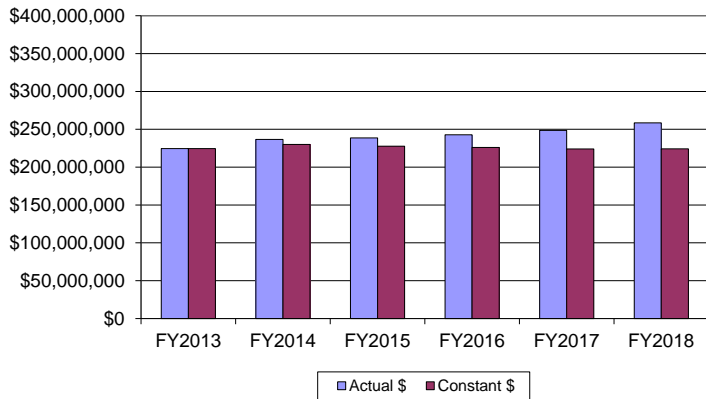
FY2016 through FY2018 - NTD Reports, (2018 data is preliminary; FTEs include operating labor only)

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

Exhibit 4.1: Operating Cost per Vehicle Service Hour – Bus Service



Operating Cost



Vehicle Service Hours

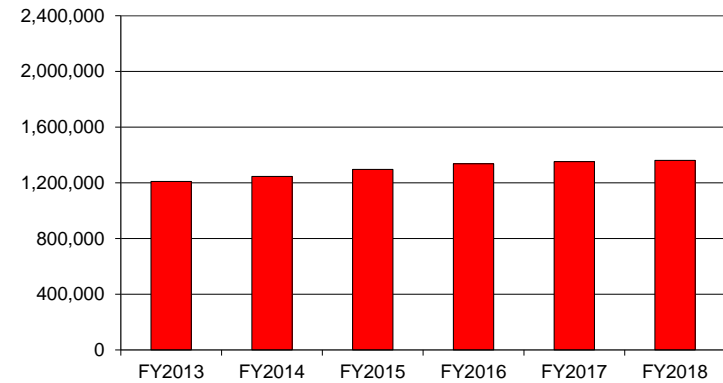
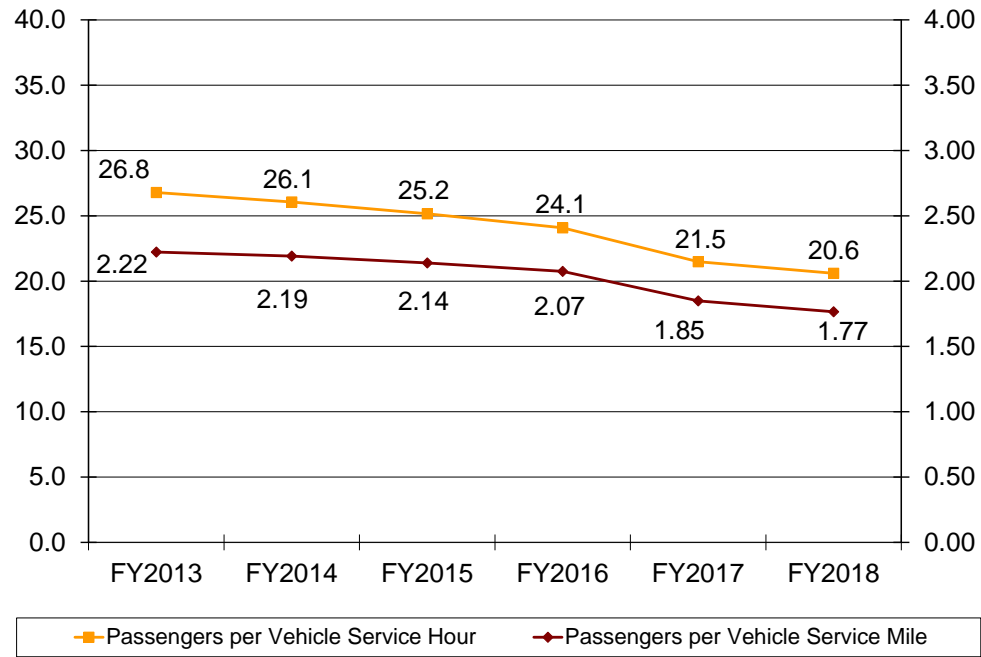
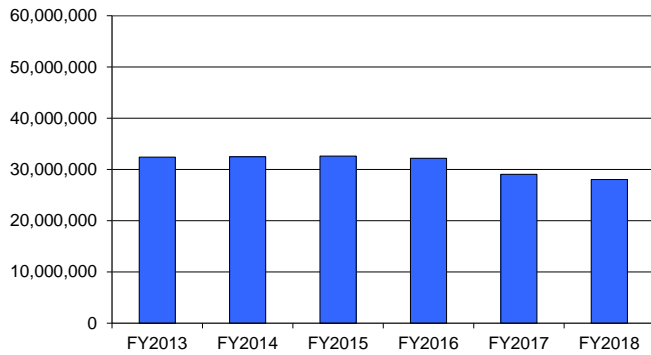


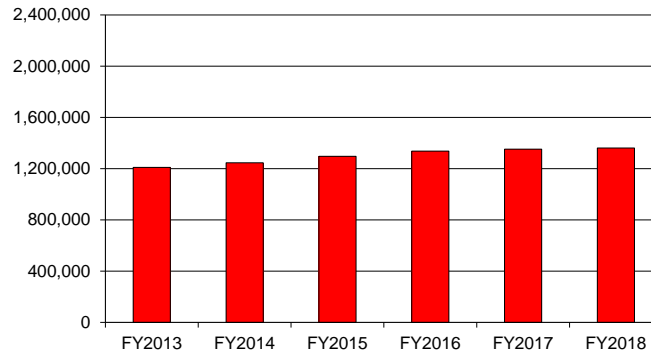
Exhibit 4.2: Passengers per Hour and per Mile – Bus Service



Unlinked Passengers



Vehicle Service Hours



Vehicle Service Miles

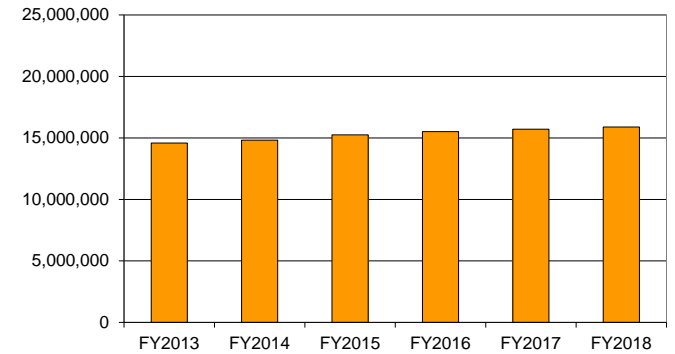
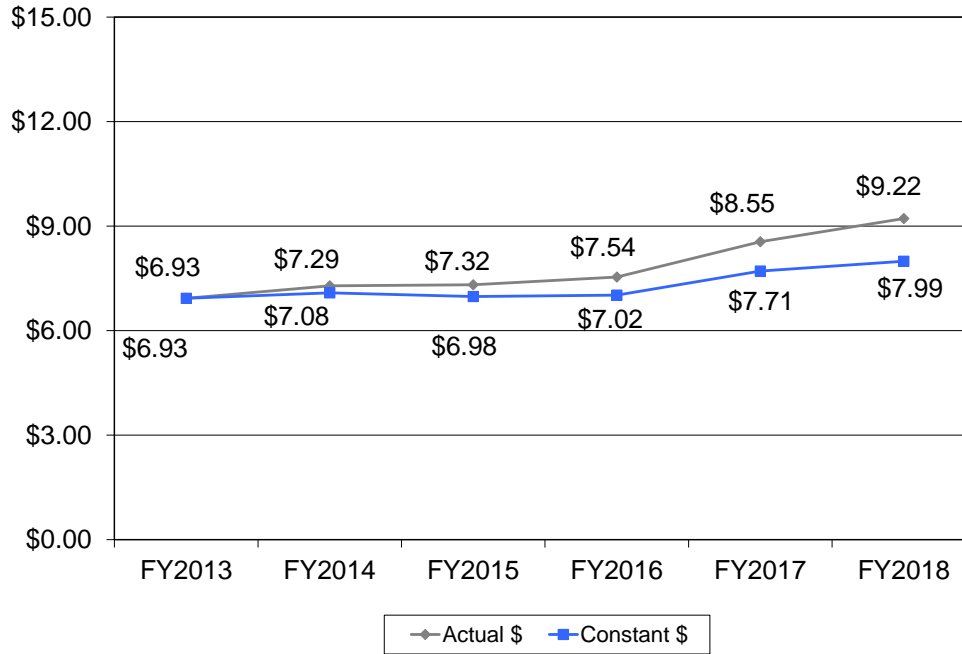
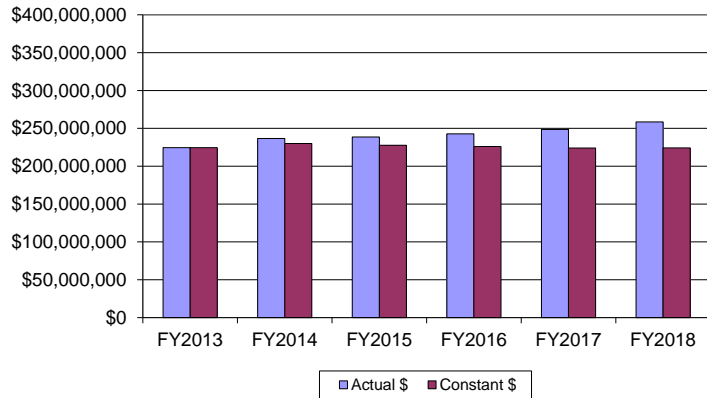


Exhibit 4.3: Operating Cost per Passenger – Bus Service



Operating Cost



Unlinked Passengers

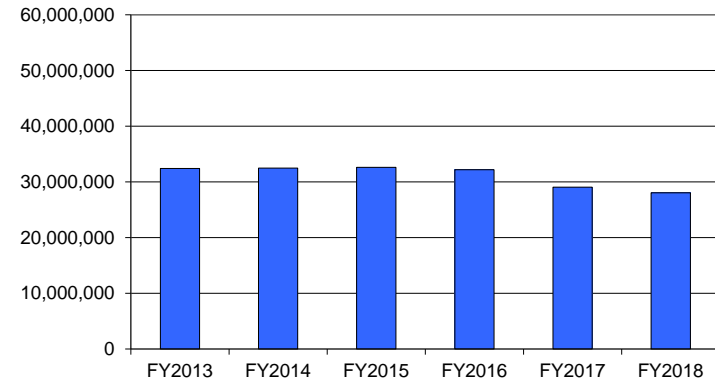
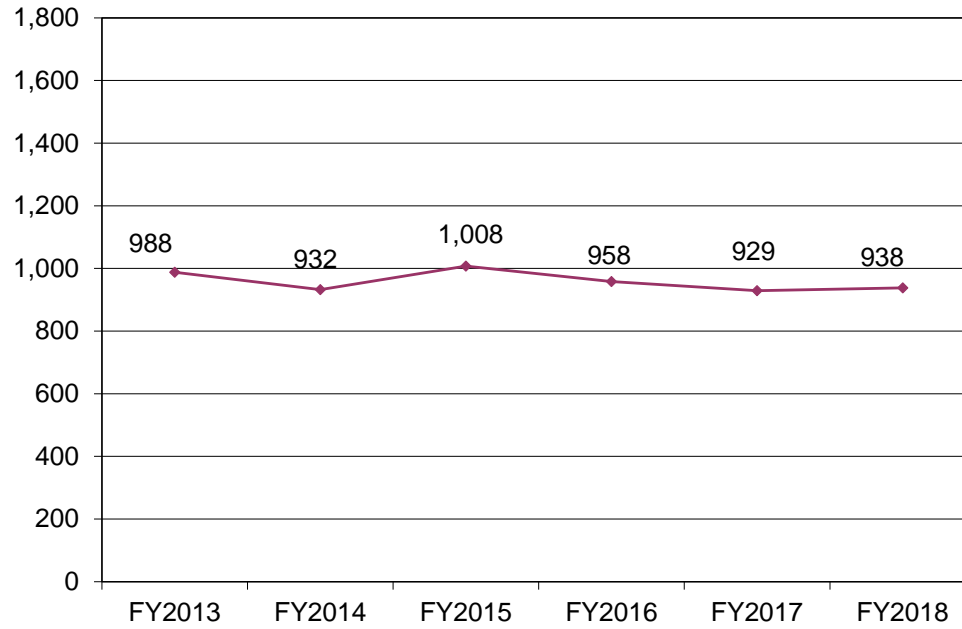
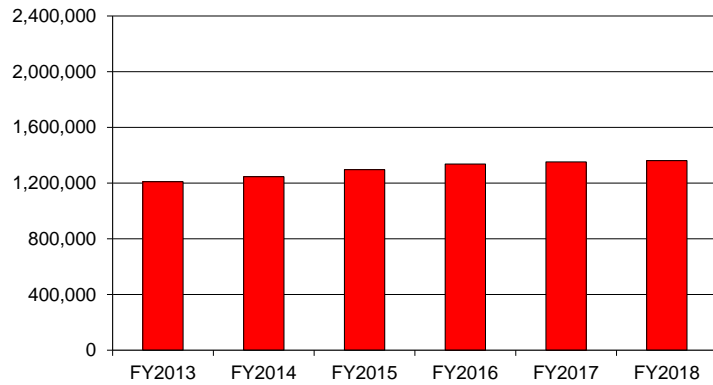


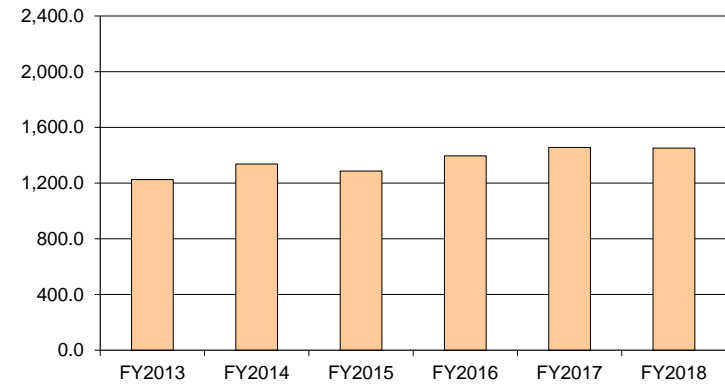
Exhibit 4.4: Vehicle Service Hours per FTE – Bus Service



Vehicle Service Hours



Full-time Equivalent



Bus Service Component Costs

In addition, 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 bus service hour that can be attributed to each included cost component.

- There were modest increases in most component cost categories between FY2013 and FY2018. Overall, operating costs increased by 2.9 percent annually.
- Labor costs increased an average of 5.3 percent per year. Fringe benefits costs were almost unchanged over the six-year period. Labor and fringe benefit costs represented the largest portion of the total costs, comprising about 80 percent of total operating costs in all six year
- Representing less than two percent of total costs, casualty/liability costs increased by 20.5 percent over the period, mostly due to a more than 200 percent increase in FY2014, and 49.2 percent increase in FY2018. The 2014 increase was due to a one-time general liability reserve adjustment to increase liability insurance reserves made by VTA FY2014.
- Services, fuel/lubricants, and materials/supplies costs contributed about 15 percent of total costs.

* * * * *

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

- Labor and benefit costs represented the largest portion of the total costs, representing about 80 percent in all six years. Labor costs increased an

average of approximately five percent annually, while fringe benefit costs remained almost unchanged.

- There were modest changes in most component cost categories, with average annual increases of five percent or less in five of the seven cost categories examined.
- Services, fuel, and materials/supplies contributed about 15 percent of total costs, while the remaining categories contributed two percent or less to total costs over the six year period.

Exhibit 4.5: TDA Component Costs Trends – Bus Service

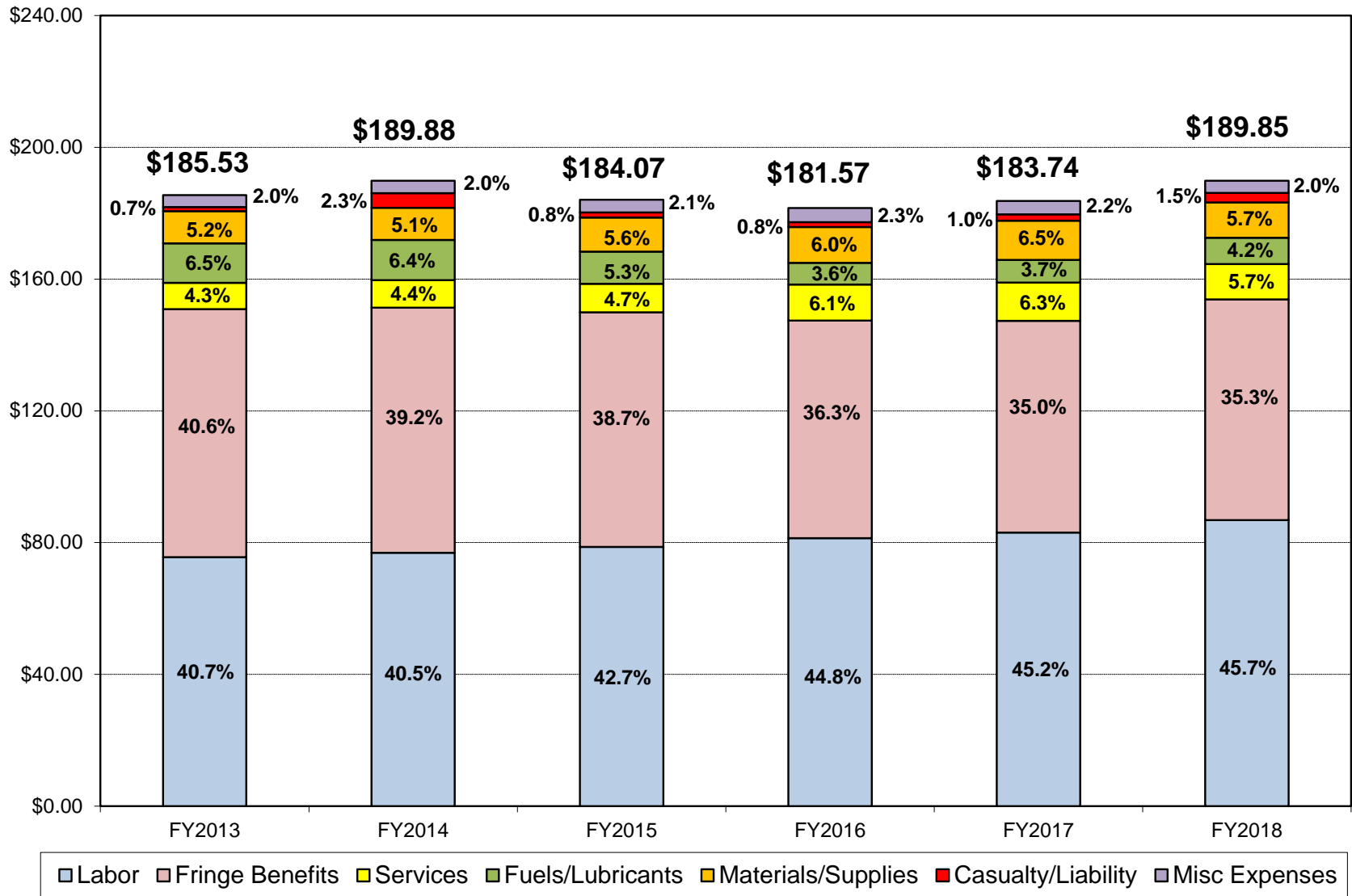
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Av. Ann. Chg.
COST CATEGORIES							
Labor (Salaries/Wages)	\$91,420,976	\$95,820,710	\$102,000,272	\$108,794,199	\$112,296,401	\$118,237,416	--
<i>Annual Change</i>	--	4.8%	6.4%	6.7%	3.2%	5.3%	5.3%
Fringe Benefits	\$91,096,315	\$92,741,772	\$92,342,887	\$88,217,590	\$86,917,714	\$91,175,736	--
<i>Annual Change</i>	--	1.8%	-0.4%	-4.5%	-1.5%	4.9%	0.0%
Services	\$9,729,589	\$10,429,620	\$11,289,111	\$14,698,874	\$15,769,184	\$14,681,502	--
<i>Annual Change</i>	--	7.2%	8.2%	30.2%	7.3%	-6.9%	8.6%
Fuels/Lubricants	\$14,484,934	\$15,211,109	\$12,628,849	\$8,731,942	\$9,237,052	\$10,793,291	--
<i>Annual Change</i>	--	5.0%	-17.0%	-30.9%	5.8%	16.8%	-5.7%
Materials/Supplies	\$11,755,499	\$12,085,989	\$13,391,898	\$14,538,719	\$16,140,205	\$14,654,880	--
<i>Annual Change</i>	--	2.8%	10.8%	8.6%	11.0%	-9.2%	4.5%
Casualty/Liability	\$1,527,742	\$5,536,512	\$2,017,462	\$2,046,488	\$2,598,999	\$3,878,156	--
<i>Annual Change</i>	--	262.4%	-63.6%	1.4%	27.0%	49.2%	20.5%
Misc. Expenses (a)	\$4,459,859	\$4,767,600	\$4,990,681	\$5,684,021	\$5,517,628	\$5,066,112	--
<i>Annual Change</i>	--	6.9%	4.7%	13.9%	-2.9%	-8.2%	2.6%
Total	\$224,474,914	\$236,593,312	\$238,661,160	\$242,711,833	\$248,477,183	\$258,487,093	--
<i>Annual Change</i>	--	5.4%	0.9%	1.7%	2.4%	4.0%	2.9%
OPERATING STATISTICS							
Vehicle Service Hours	1,209,931	1,246,022	1,296,567	1,336,767	1,352,310	1,361,557	--
<i>Annual Change</i>	--	3.0%	4.1%	3.1%	1.2%	0.7%	2.4%

(a) Includes tires & tubes, utilities, taxes, and miscellaneous expenses

Source: FY 2013 –FY2015 prior audit report; FY2016 through FY2018 NTD Reports

Exhibit 4.6: Distribution of Component Costs – Bus Service

Operating Cost per Vehicle Service Hour



Light Rail Performance Trends

This section provides an overview of the performance of VTA's light rail service over the six year analysis period. The trends in the five TDA indicators and input data are presented in Exhibit 5. The six-year trends are illustrated in Exhibits 5.1 through 5.4.

- Operating Cost per Car Service Hour (Exhibit 5.1)
 - VTA's light rail cost per hour increased overall from \$347.59 in FY2013 to \$583.09 in FY2018, or an average of 10.9 percent per year over the six years.
 - Operating costs rose consistently in every year of the period, by an average of 13.3 percent annually, while car service hours increased only about one-sixth as much.
 - The increase in costs is attributed to the mid-life overhaul of the light rail fleet, a project which VTA chose to complete in-house, rather than outsource, due to projected cost savings.
 - Presented in constant FY2013 dollars, there was an average annual increase of 7.8 percent over the six years.
- Passengers per Car Service Hour (Exhibit 5.2)
 - Overall performance decreased from 54.1 passengers in FY2013 to 38.6 in FY2018.
 - This trend resulted in an average annual decrease of 6.6 percent over the six years, as annual passenger levels decreased an average 4.6 percent per year while service hours increased 2.1 percent on average per year.
- Passengers per Car Service Mile (Exhibit 5.2)
 - Performance in passengers per car service mile was similar, as passengers per mile decreased overall from 3.35 to 2.27 between FY2013 and FY2018. Passengers per mile decreased in every year of the period.

- Passengers per service mile decreased an annual average of 5.2 percent, as service miles increased slightly and unlinked passengers decreased, specifically over the current audit period of FY2016 to FY2018.
- Operating Cost per Passenger (Exhibit 5.3)
 - Cost effectiveness declined by 18.7 percent per year on average through the review period, from \$6.42 per passenger in FY2013 to \$15.12 in FY2018.
 - Operating costs increased by double digit percentages over the period, with ridership decreasing over the same period, especially over the current audit period.
 - With the impact of inflation removed from the cost side (normalization), the result was an average annual increase in the cost per passenger of 15.4 percent over the six years.
- Car Service Hours per FTE (Exhibit 5.4)
 - Employee productivity declined from 635 hours per FTE in FY2013 to 463 hours in FY2018, the lowest level of the period.
 - Overall, hours per FTE decreased an average of 6.1 percent per year, due to an average annual 8.8 percent increase in FTEs during the six-year period, while car service hours increased at a 2.1 percent annual average.

* * * * *

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

- Cost efficiency declined, with an average annual increase in the operating cost per hour of 10.9 percent (7.8 percent in inflation adjusted dollars). Annual operating costs rose by an average of 13.3 percent annually, with a much smaller average annual increase in service delivery.

- The operating cost per passenger averaged an annual increase of 18.7 percent, which amounted to a 15.4 percent increase when normalized in FY2013 dollars.
- Passenger productivity worsened, with passengers per hour decreasing 6.6 percent per year on average and passengers per mile decreasing 5.2 percent annually on average over the six-year period.
- Employee productivity increased overall during the period, mainly due to steady increases in FTEs during the current audit period.

Exhibit 5: TDA Indicator Performance – Light Rail

	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Av. Ann. Chg.
Performance Indicators							
Op. Cost per Car Svc. Hour (Actual \$)	\$347.59	\$341.47	\$366.67	\$423.09	\$487.58	\$583.09	- -
<i>Annual Change</i>	- -	-1.8%	7.4%	15.4%	15.2%	19.6%	10.9%
Op. Cost per Car Svc. Hour (Constant \$)	\$347.59	\$331.96	\$349.86	\$393.97	\$439.72	\$505.75	- -
<i>Annual Change</i>	- -	-4.5%	5.4%	12.6%	11.6%	15.0%	7.8%
Passengers per Car Service Hour	54.1	50.1	51.1	49.1	42.0	38.6	- -
<i>Annual Change</i>	- -	-7.5%	2.1%	-4.0%	-14.4%	-8.2%	-6.6%
Passengers per Car Service Mile	3.35	3.23	3.22	3.09	2.73	2.57	- -
<i>Annual Change</i>	- -	-3.5%	-0.2%	-4.1%	-11.7%	-5.9%	-5.2%
Op. Cost per Passenger (Actual \$)	\$6.42	\$6.82	\$7.17	\$8.62	\$11.61	\$15.12	- -
<i>Annual Change</i>	- -	6.2%	5.2%	20.2%	34.7%	30.2%	18.7%
Op. Cost per Passenger (Constant \$)	\$6.42	\$6.63	\$6.84	\$8.03	\$10.47	\$13.11	- -
<i>Annual Change</i>	- -	3.3%	3.2%	17.3%	30.4%	25.3%	15.4%
Car Service Hours per FTE	635	546	727	496	489	463	- -
<i>Annual Change</i>	- -	-14.0%	33.1%	-31.8%	-1.4%	-5.3%	-6.1%
Input Data							
Operating Cost (Actual \$)	\$68,972,255	\$74,694,030	\$81,316,886	\$92,428,467	\$106,017,010	\$128,622,203	- -
<i>Annual Change</i>	- -	8.3%	8.9%	13.7%	14.7%	21.3%	13.3%
Operating Cost (Constant \$)	\$68,972,255	\$72,614,562	\$77,587,117	\$86,066,899	\$95,609,950	\$111,562,327	- -
<i>Annual Change</i>	- -	5.3%	6.8%	10.9%	11.1%	16.7%	10.1%
Car Service Hours	198,429	218,744	221,769	218,459	217,434	220,589	- -
<i>Annual Change</i>	- -	10.2%	1.4%	-1.5%	-0.5%	1.5%	2.1%
Car Service Miles	3,208,060	3,391,181	3,518,983	3,470,427	3,349,372	3,314,903	- -
<i>Annual Change</i>	- -	5.7%	3.8%	-1.4%	-3.5%	-1.0%	0.7%
Unlinked Passengers	10,742,292	10,952,965	11,338,905	10,721,047	9,132,084	8,507,096	- -
<i>Annual Change</i>	- -	2.0%	3.5%	-5.4%	-14.8%	-6.8%	-4.6%
Employee Full-Time Equivalents	312.6	400.5	305.1	440.6	444.6	476.5	- -
<i>Annual Change</i>	- -	28.1%	-23.8%	44.4%	0.9%	7.2%	8.8%
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%

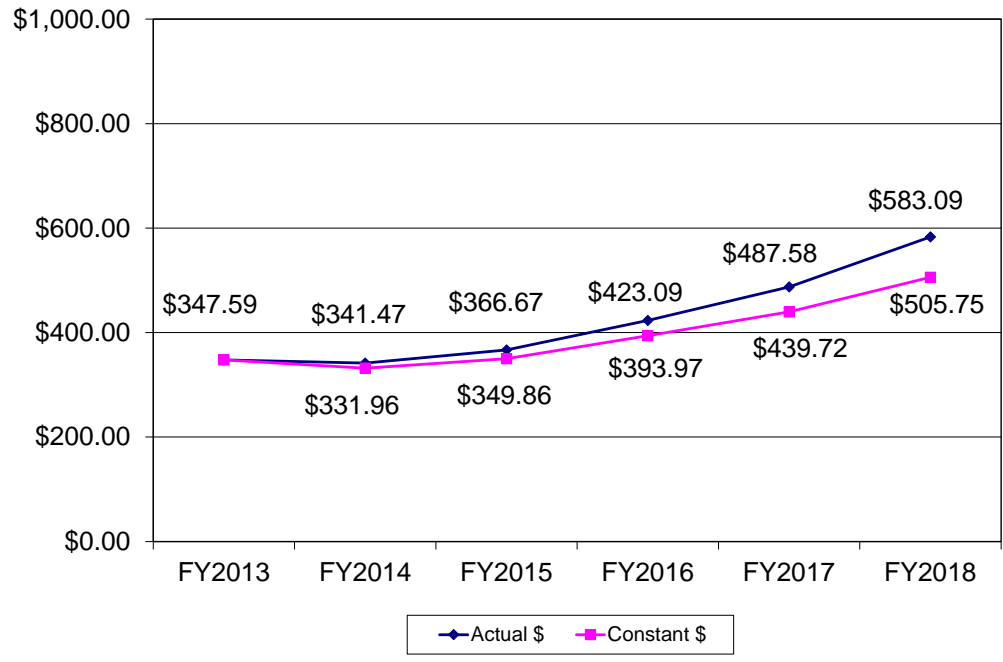
Sources:

FY2013 through FY2015 - Prior Performance Audit Report

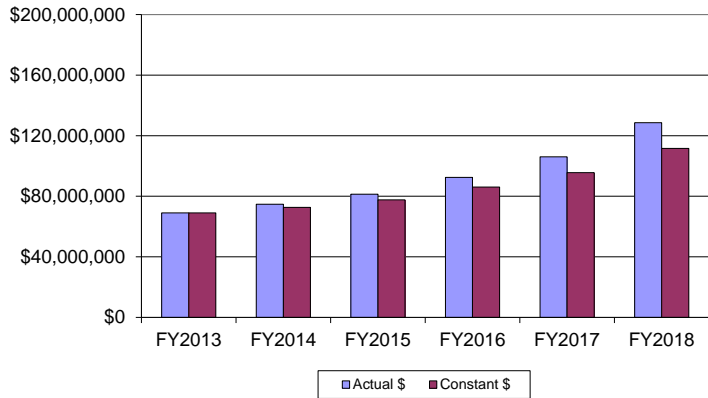
FY2016 through FY2018 - NTD Reports, (2018 data is preliminary; FTEs include operating labor only)

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

Exhibit 5.1: Operating Cost per Car Service Hour – Light Rail



Operating Cost



Car Service Hours

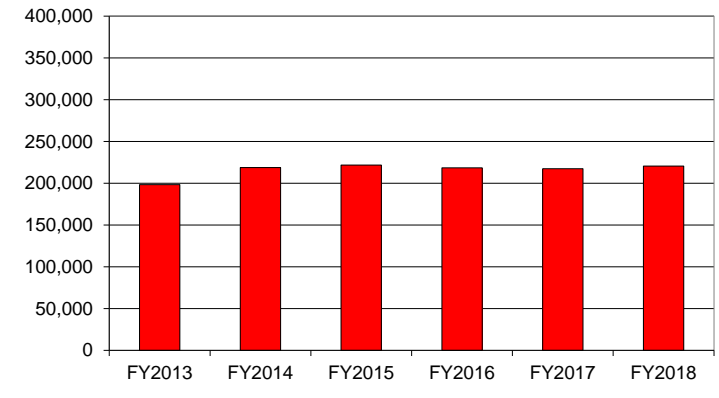
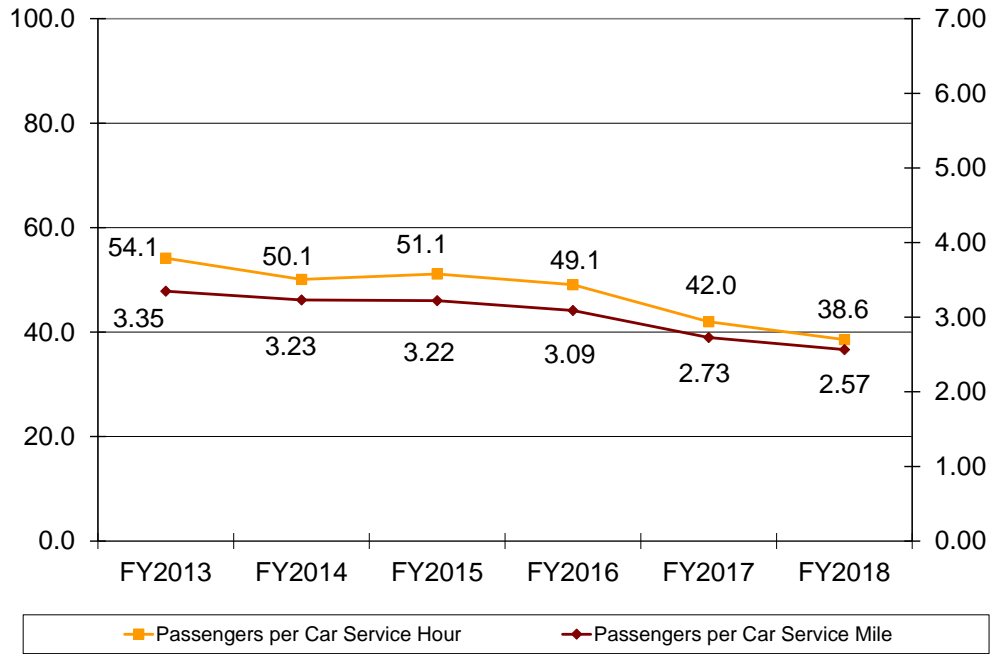
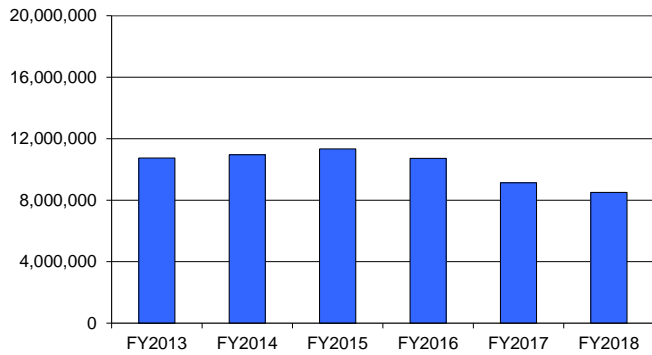


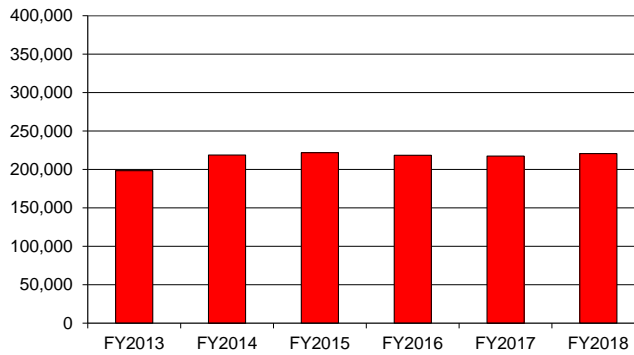
Exhibit 5.2: Passengers per Hour and per Mile – Light Rail



Unlinked Passengers



Car Service Hours



Car Service Miles

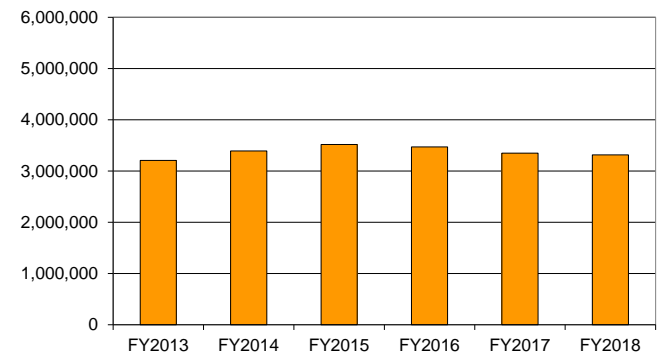
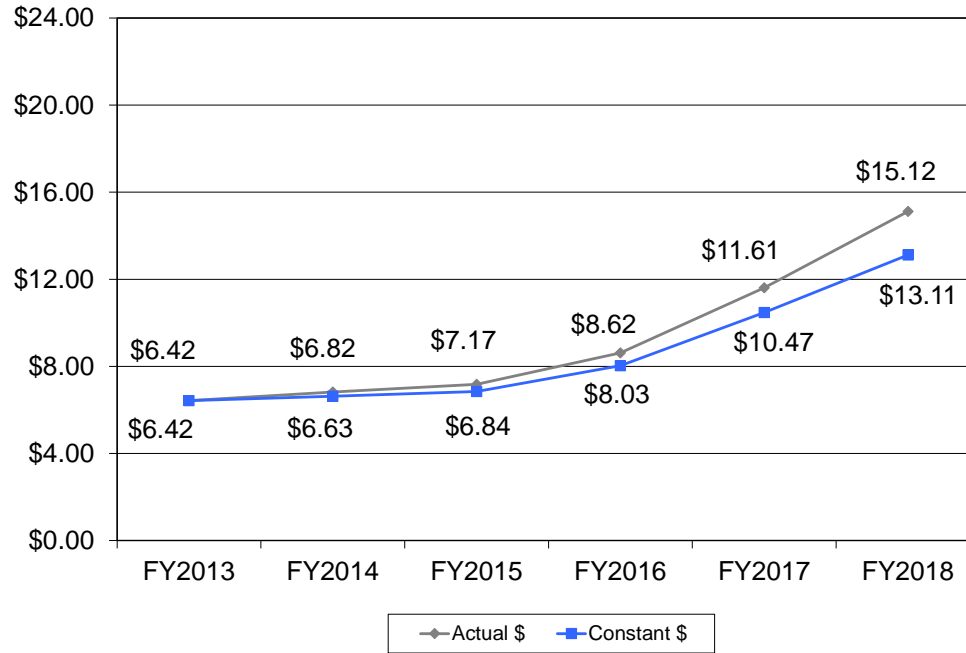
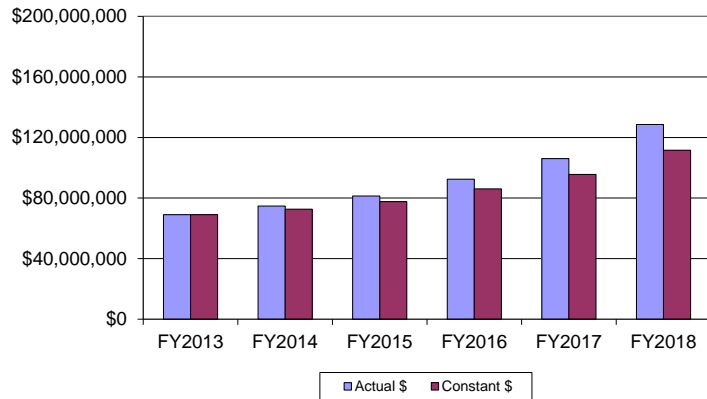


Exhibit 5.3: Operating Cost per Passenger – Light Rail



Operating Cost



Unlinked Passengers

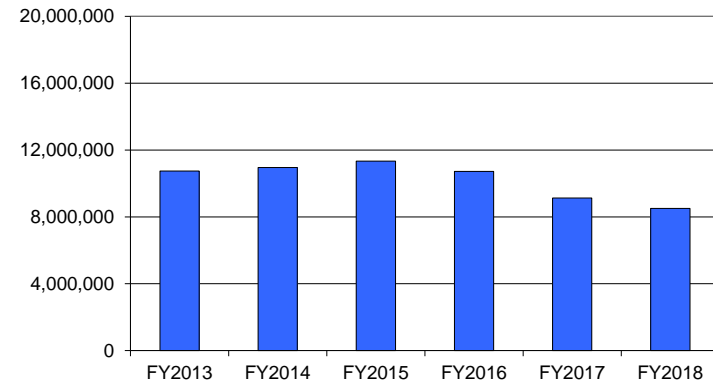
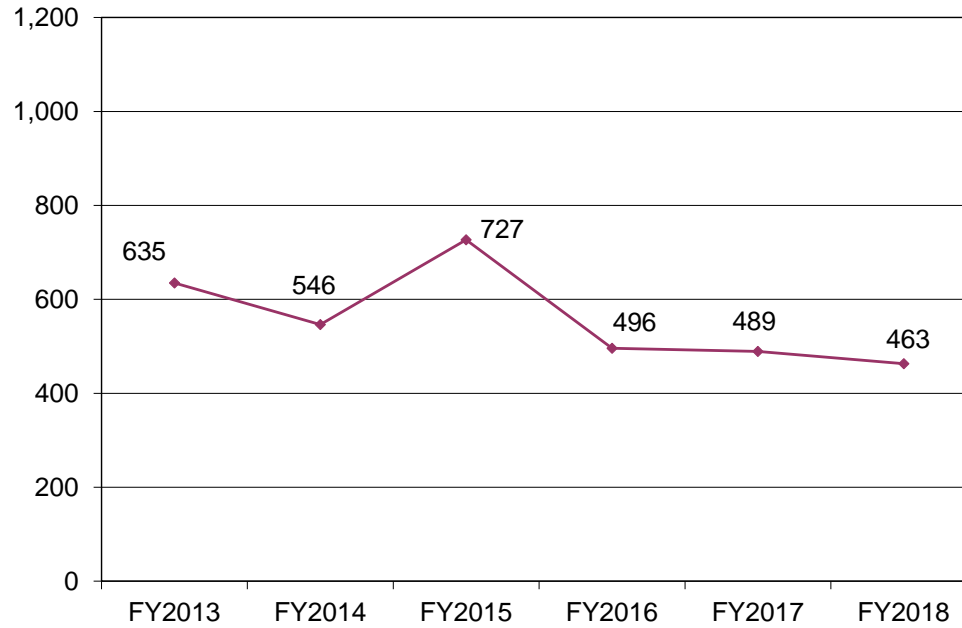
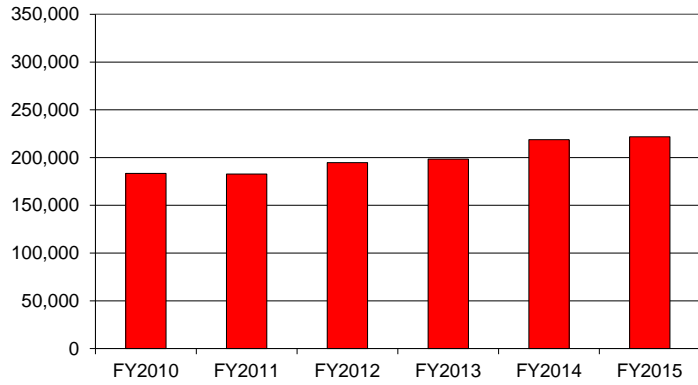


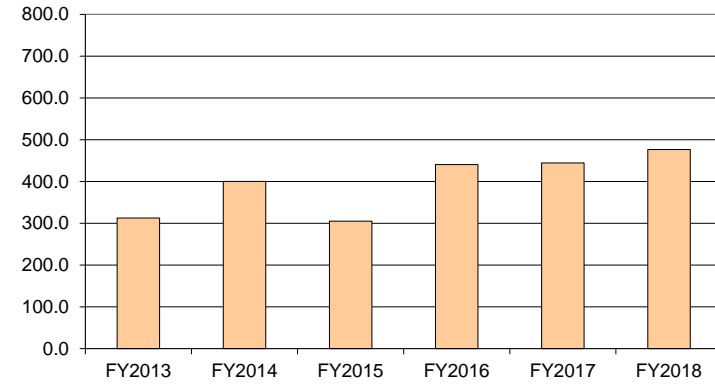
Exhibit 5.4: Car Service Hours per FTE – Light Rail



Car Service Hours



Full-time Equivalent



Light Rail Component Costs

The year-to-year changes in selected operating cost categories over the current audit period are presented in Exhibit 5.5, 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 5.6.

- There were consistent annual increases in every cost category across the board between FY2013 and FY2018, resulting in an overall average increase in operating costs of 13.3 percent per year.
- The cost increases generally were highest in the current audit period (FY2016 – FY2018), with the largest annual increase occurring in 2018. The increase in costs is attributed to the mid-life maintenance overhaul of the light rail fleet.
- Labor and fringe costs rose an annual average of 12.5 percent and 5.9 percent, respectively. Labor and fringe benefits costs combined contributed between 65 and 70 percent of total hourly costs in all six years.
- Service costs increased an average of 18.4 percent per year, while costs for materials/supplies increased an average of 34 percent.
- The services and materials/supplies categories each increased their share of total costs during the six-year period, with services increasing from about 11 percent to 14 percent, and materials/supplies increasing from about seven percent to 16 percent of total costs.
- Costs for utilities rose an annual average of 7.2 percent; casualty/liability 36.8 percent and miscellaneous costs 11.4 percent during the six-year period.
- These last cost component categories contributed less than 10 percent of total operating costs.

* * * * *

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

- There were consistent, significant increases in total costs over the audit period, with an average annual increase of 13.3 percent.
- Costs increased in every cost category, with average double digit cost increases in five of the seven cost categories each year. Cost increases were highest during the current audit period (FY2016 through FY2018).
- The increase in costs is attributed to the mid-life maintenance overhaul of the light rail fleet, a project which VTA chose to complete in-house, rather than outsource, due to projected cost savings.
- The labor and fringe benefits costs contributed between 65 and 70 percent of total hourly costs.
- The share of total operating cost for services and materials/supplies increased their share of total costs during the period to about 14 percent and 16 percent, respectively. The remaining cost component categories contributed less than 10 percent in total.

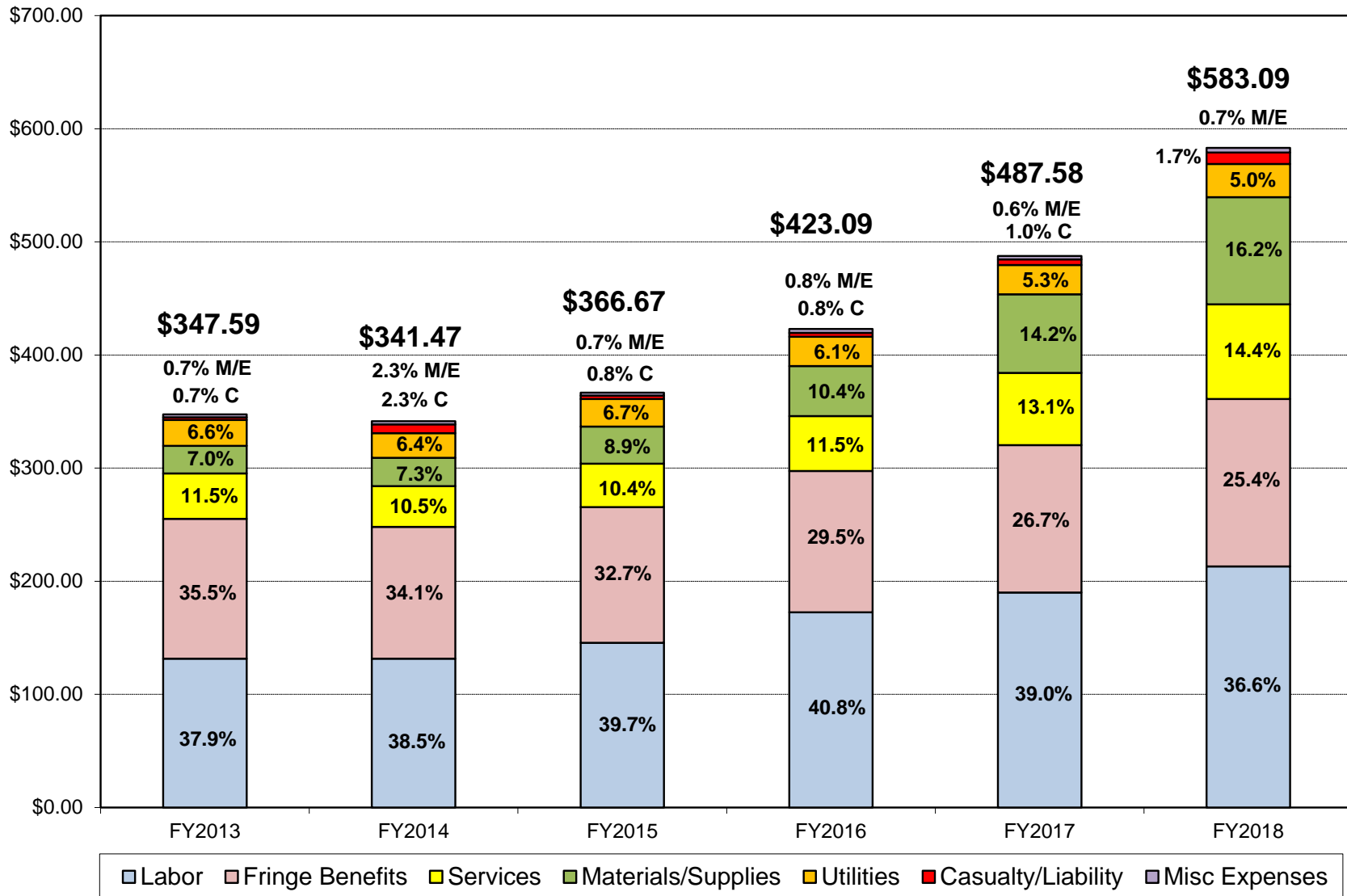
Exhibit 5.5: TDA Component Costs Trends –Light Rail

	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Av. Ann. Chg.
COST CATEGORIES							
Labor (Salaries/Wages)	\$26,128,050	\$28,772,719	\$32,308,087	\$37,707,384	\$41,336,414	\$47,033,857	--
<i>Annual Change</i>	--	10.1%	12.3%	16.7%	9.6%	13.8%	12.5%
Fringe Benefits	\$24,501,433	\$25,480,852	\$26,604,515	\$27,283,043	\$28,308,216	\$32,618,085	--
<i>Annual Change</i>	--	4.0%	4.4%	2.6%	3.8%	15.2%	5.9%
Services	\$7,949,940	\$7,868,738	\$8,479,402	\$10,586,729	\$13,909,844	\$18,489,550	--
<i>Annual Change</i>	--	-1.0%	7.8%	24.9%	31.4%	32.9%	18.4%
Materials/Supplies	\$4,839,918	\$5,476,442	\$7,261,664	\$9,654,669	\$15,088,938	\$20,878,306	--
<i>Annual Change</i>	--	13.2%	32.6%	33.0%	56.3%	38.4%	34.0%
Utilities	\$4,571,833	\$4,769,535	\$5,433,912	\$5,667,631	\$5,638,331	\$6,481,382	--
<i>Annual Change</i>	--	4.3%	13.9%	4.3%	-0.5%	15.0%	7.2%
Casualty/Liability	\$466,562	\$1,733,698	\$681,276	\$774,174	\$1,088,222	\$2,238,102	--
<i>Annual Change</i>	--	271.6%	-60.7%	13.6%	40.6%	105.7%	36.8%
Misc. Expenses (a)	\$514,519	\$592,046	\$548,030	\$754,837	\$647,245	\$882,921	--
<i>Annual Change</i>	--	15.1%	-7.4%	37.7%	-14.3%	36.4%	11.4%
Total	\$68,972,255	\$74,694,030	\$81,316,886	\$92,428,467	\$106,017,210	\$128,622,203	--
<i>Annual Change</i>	--	8.3%	8.9%	13.7%	14.7%	21.3%	13.3%
OPERATING STATISTICS							
Car Service Hours	198,429	218,744	221,769	218,459	217,434	220,589	--
<i>Annual Change</i>	--	10.2%	1.4%	-1.5%	-0.5%	1.5%	2.1%

(a) Includes fuels/lubricants, tires/tubes, taxes, and miscellaneous expenses

Source: FY2013 -FY2015, prior audit; FY2016 through FY2018 NTD Reports

Exhibit 5.6: Distribution of Component Costs – Light Rail
Operating Cost per Vessel Service Hour



Rail Shuttle Performance Trends

This section provides an overview of the performance of VTA's rail shuttle service over the six year analysis period. The trends in the TDA indicators and input data are presented in Exhibit 6. The six-year trends are illustrated in Exhibits 6.1 through 6.3.

- Operating Cost per Vehicle Service Hour (Exhibit 6.1)
 - VTA's shuttle bus cost per hour increased from \$80.13 in FY2013 to \$100.89 in FY2018.
 - The largest annual increase (23.6 percent) occurred in FY2014, when operating costs increased by about 12 percent as service hours decreased about nine percent. The decrease in service levels was caused by the discontinuation of the IBM shuttle service after FY2013.
 - Overall, the cost per hour increased an average of 4.7 percent per year over the six years.
 - In constant FY2013 dollars, there was an average annual increase of 1.8 percent over the same period.
- Passengers per Vehicle Service Hour (Exhibit 6.2)
 - Passengers per vehicle service hour increased over the review period, from 18 passengers per hour in FY2013 to 24.2 passengers per hour in FY2018.
 - This trend was driven by increasing ridership over the period, while service levels decreased slightly.
 - Overall there was an average annual increase of 6.1 percent in passenger productivity.
- Passengers per Vehicle Service Mile (Exhibit 6.2)
 - Performance in passengers per vehicle service mile mirrored that of passengers per hour as passengers per mile increased from 1.56 in

FY2013 to 2.25 passengers per mile in FY2018. Vehicle service miles decreased at a slightly higher rate than service hours.

- Overall, there was an average annual increase in this indicator of 7.6 percent.

- Operating Cost per Passenger (Exhibit 6.3)

- Cost effectiveness improved by 1.3 percent per year on average through the review period, from \$4.46 per passenger in FY2013 to \$4.17 in FY2018.
- Passenger levels increased by almost 5 percent per year over the period, while operating costs increased only 3.1 percent per year.
- With the impact of inflation removed from the cost side (normalization), the result is an average annual decrease in cost per passenger of 4.1 percent over the six years.

* * * * *

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

- Cost efficiency declined overall, with an average annual increase in the operating cost per hour of 4.7 percent (1.8 percent in inflation adjusted dollars). Steady annual increases in operating costs and lower service levels influenced this indicator.
- The operating cost per passenger averaged an annual decrease of 1.3 percent, or 4.1 percent in normalized FY2013 dollars. Passenger levels increased by almost 5 percent per year over the period, while operating costs increased only 3.1 percent per year.
- Passenger productivity improved, with passengers per hour increasing about six percent and passengers per mile increasing over seven percent per year on average.

Exhibit 6: TDA Indicator Performance – Rail Shuttle

	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Av. Ann. Chg.
Performance Indicators							
Op. Cost per Vehicle Svc. Hour (Actual \$)	\$80.13	\$99.06	\$103.32	\$105.84	\$98.65	\$100.89	- -
<i>Annual Change</i>	- -	23.6%	4.3%	2.4%	-6.8%	2.3%	4.7%
Op. Cost per Vehicle Svc. Hour (Constant \$)	\$80.13	\$96.30	\$98.58	\$98.56	\$88.97	\$87.51	- -
<i>Annual Change</i>	- -	20.2%	2.4%	0.0%	-9.7%	-1.6%	1.8%
Passengers per Vehicle Service Hour	18.0	22.2	24.1	24.3	23.1	24.2	- -
<i>Annual Change</i>	- -	23.7%	8.3%	1.1%	-4.9%	4.6%	6.1%
Passengers per Vehicle Service Mile	1.56	2.01	2.17	2.21	2.15	2.25	- -
<i>Annual Change</i>	- -	28.4%	8.2%	2.0%	-3.0%	4.9%	7.6%
Op. Cost per Passenger (Actual \$)	\$4.46	\$4.46	\$4.29	\$4.35	\$4.26	\$4.17	- -
<i>Annual Change</i>	- -	-0.1%	-3.7%	1.3%	-2.0%	-2.2%	-1.3%
Op. Cost per Passenger (Constant \$)	\$4.46	\$4.33	\$4.10	\$4.05	\$3.84	\$3.62	- -
<i>Annual Change</i>	- -	-2.9%	-5.5%	-1.2%	-5.1%	-5.9%	-4.1%
Vehicle Service Hours per FTE	(a)	(a)	(a)	(a)	(a)	(a)	- -
<i>Annual Change</i>	- -	- -	- -	- -	- -	- -	- -
Input Data							
Operating Cost (Actual \$)	\$1,522,314	\$1,706,945	\$1,789,984	\$1,863,467	\$1,734,698	\$1,771,267	- -
<i>Annual Change</i>	- -	12.1%	4.9%	4.1%	-6.9%	2.1%	3.1%
Operating Cost (Constant \$)	\$1,522,314	\$1,659,424	\$1,707,883	\$1,735,210	\$1,564,413	\$1,536,334	- -
<i>Annual Change</i>	- -	9.0%	2.9%	1.6%	-9.8%	-1.8%	0.2%
Vehicle Service Hours	18,997	17,232	17,325	17,606	17,584	17,556	- -
<i>Annual Change</i>	- -	-9.3%	0.5%	1.6%	-0.1%	-0.2%	-1.6%
Vehicle Service Miles	218,317	190,884	192,100	193,614	189,481	188,493	- -
<i>Annual Change</i>	- -	-12.6%	0.6%	0.8%	-2.1%	-0.5%	-2.9%
Unlinked Passengers	341,369	383,118	417,040	428,666	407,032	424,941	- -
<i>Annual Change</i>	- -	12.2%	8.9%	2.8%	-5.0%	4.4%	4.5%
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%

(a) Not applicable as VTA Rail Shuttle service is provided by a private contractor

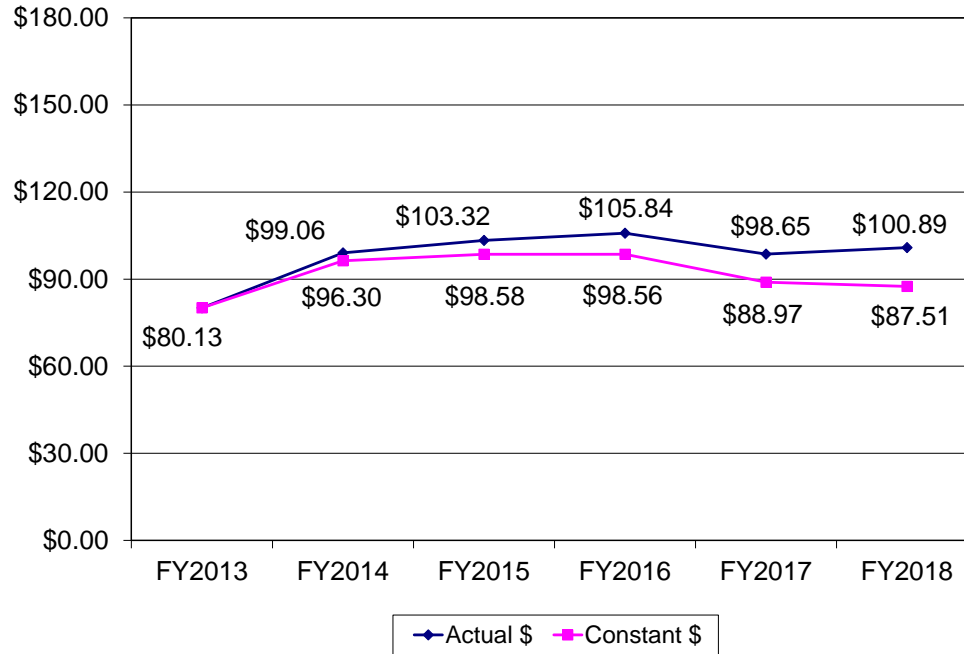
Sources:

FY2013 through FY2015 - Prior Performance Audit Report

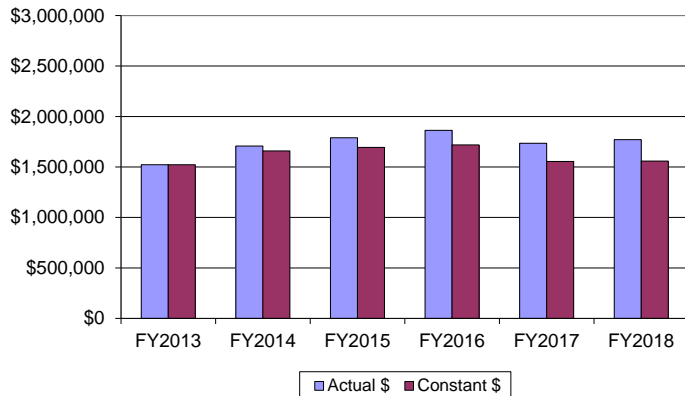
FY2016 through FY2018 - NTD Reports (2018 data is preliminary)

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

Exhibit 6.1: Operating Cost per Vehicle Service Hour – Rail Shuttle



Operating Cost



Vehicle Service Hours

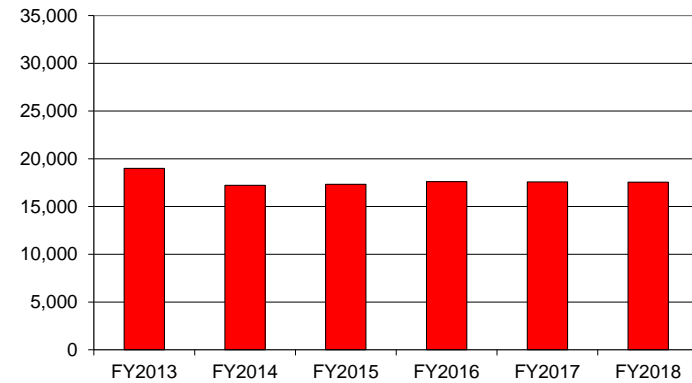
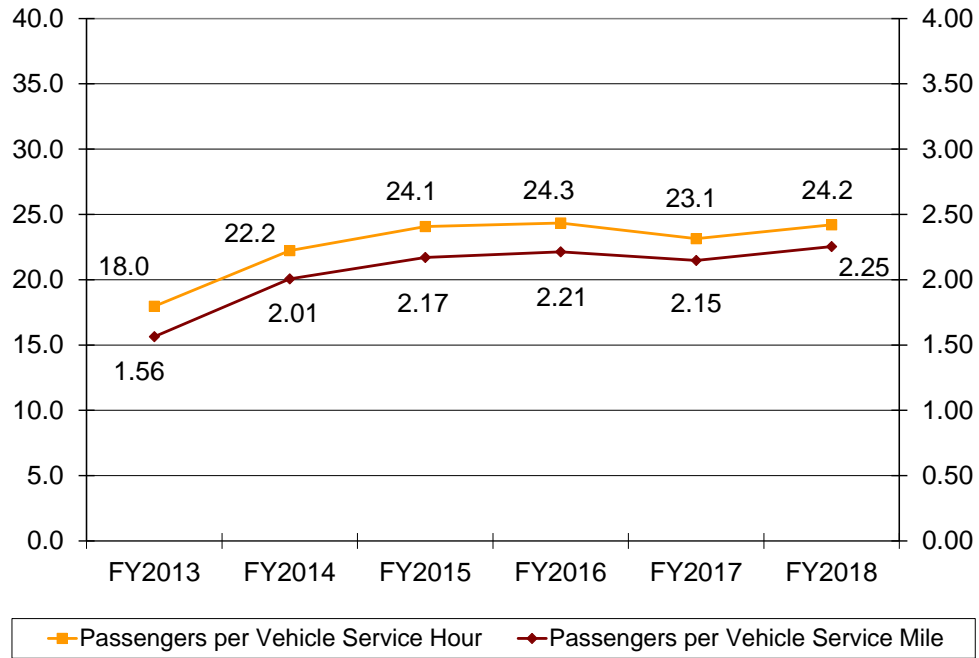
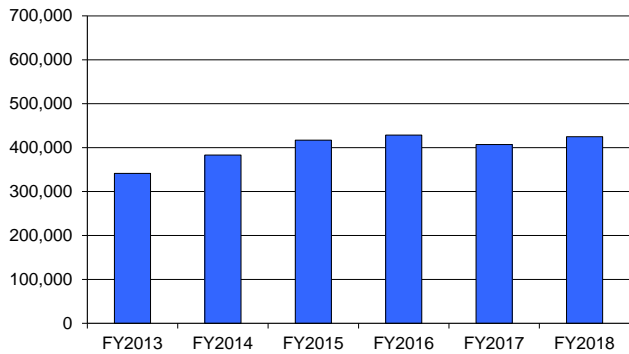


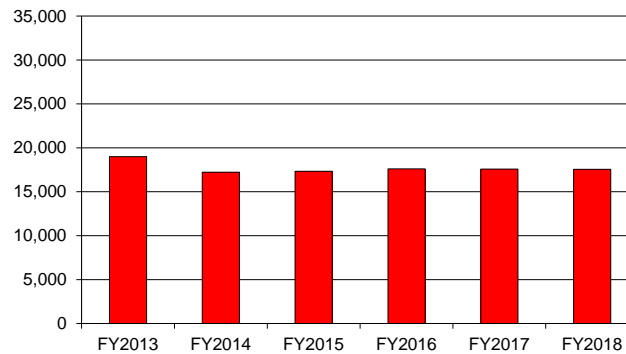
Exhibit 6.2: Passengers per Hour and per Mile – Rail Shuttle



Unlinked Passengers



Vehicle Service Hours



Vehicle Service Miles

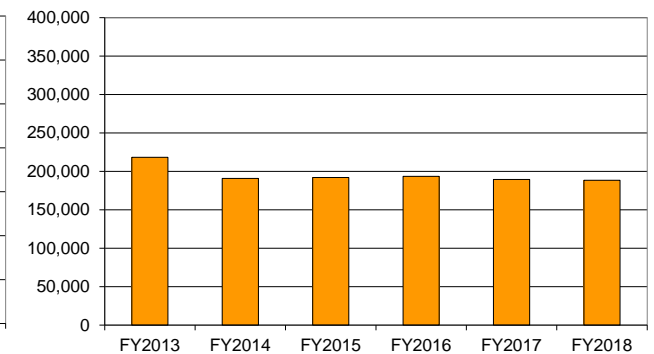
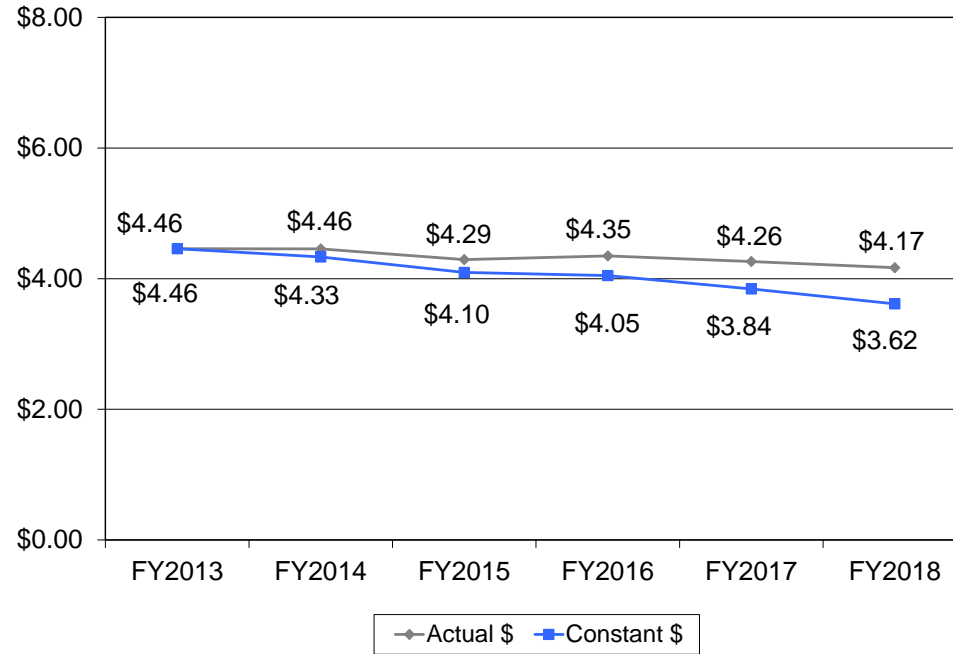
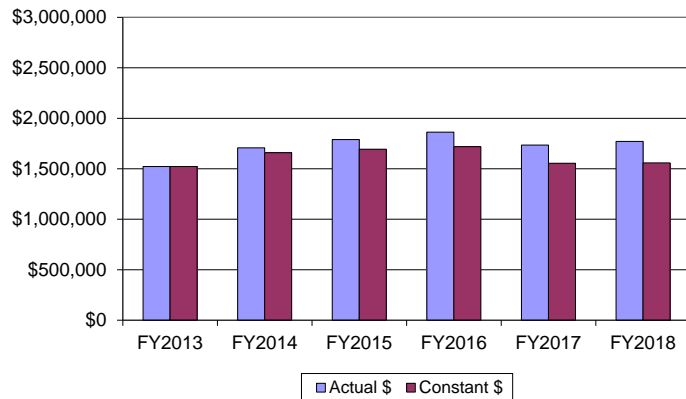


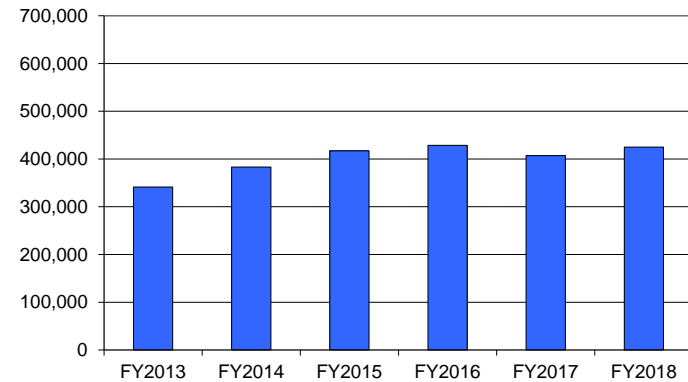
Exhibit 6.3: Operating Cost per Passenger – Rail Shuttle



Operating Cost



Unlinked Passengers



Rail Shuttle Component Costs

Year-to-year changes in selected operating cost categories over the past six years are presented in Exhibit 6.4, along with the concurrent changes in vehicle service hours and the portion of the cost per vehicle service hour that can be attributed to each included cost component. Exhibit 6.5 illustrates the portion of the cost per bus service hour that can be attributed to each included cost component.

- Total annual costs increased by 3.1 percent on average between FY2013 and FY2018. The increase in total costs was driven by a similar increase (2.6 percent) in purchased transportation costs, which is the largest component cost category.
- Purchased transportation costs were the source of just under 90 percent of all costs throughout the six-year period.
- Labor and fringe benefit costs comprise about eight percent of total costs and increased an average of 7.8 percent and two percent annually during the audit period.
- Costs in all other categories increased as well, but the remaining cost categories comprise only between 10 to 12 percent of the total hourly costs.

* * * * *

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

- Purchased transportation costs, the largest component cost category at almost 90 percent of total costs, increased by 2.6 percent per year on average, similar to the overall 3.1 percent annual increase in operating costs.
- Costs in all other categories also increased between two and 22 percent per year, but those cost categories comprise only 10 to 12 percent of the total hourly costs.

Exhibit 6.4: TDA Component Costs Trends – Rail Shuttle

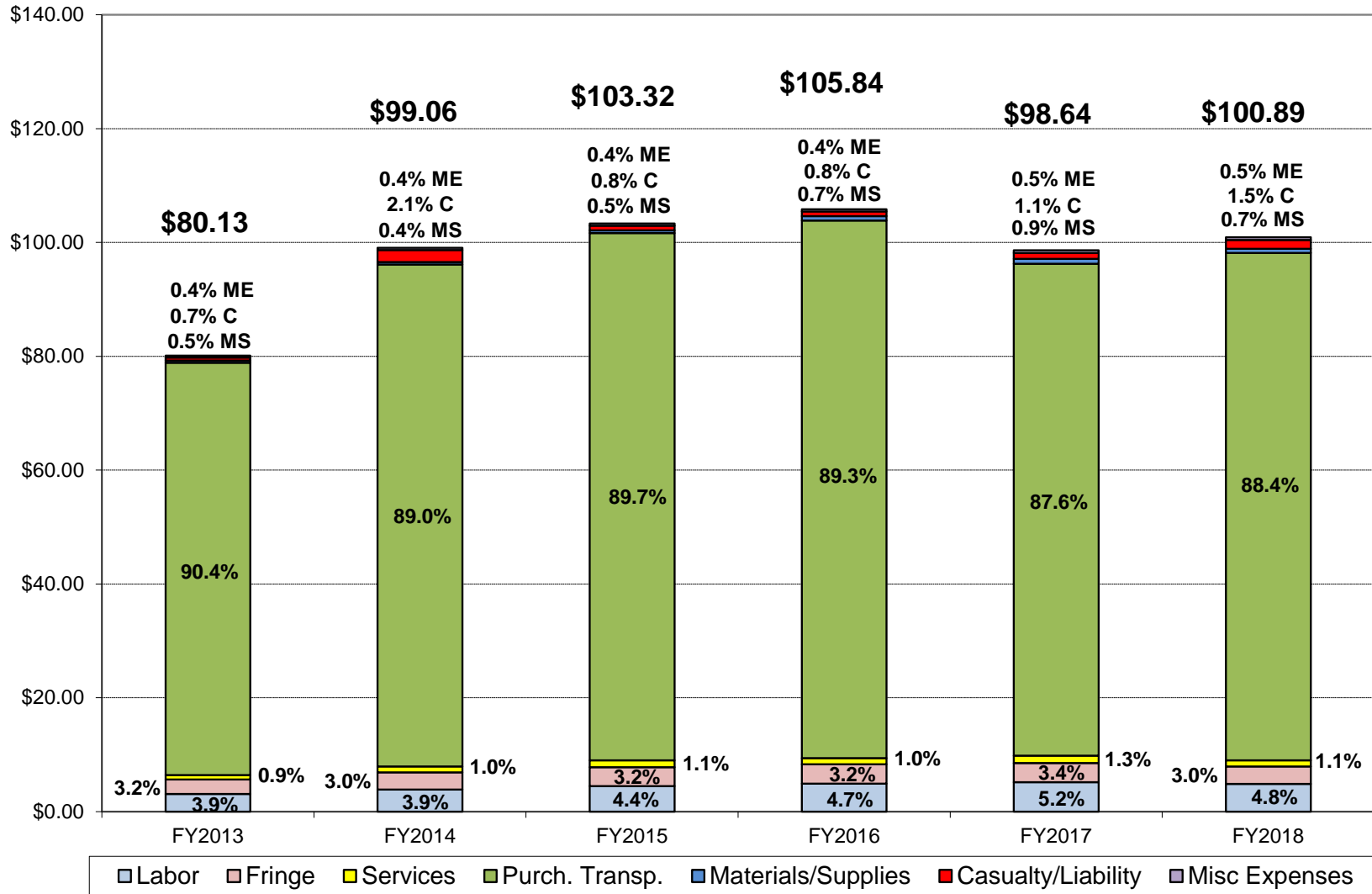
	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Av. Ann. Chg.
COST CATEGORIES							
Labor (Salaries/Wages)	\$58,676	\$67,120	\$78,063	\$86,684	\$91,010	\$85,302	--
<i>Annual Change</i>	--	14.4%	16.3%	11.0%	5.0%	-6.3%	7.8%
Fringe Benefits	\$48,918	\$52,020	\$57,484	\$59,830	\$59,066	\$53,945	--
<i>Annual Change</i>	--	6.3%	10.5%	4.1%	-1.3%	-8.7%	2.0%
Services	\$14,186	\$17,382	\$20,387	\$18,966	\$23,207	\$18,815	--
<i>Annual Change</i>	--	22.5%	17.3%	-7.0%	22.4%	-18.9%	5.8%
Materials/Supplies	\$7,630	\$7,344	\$8,547	\$13,193	\$15,390	\$12,868	--
<i>Annual Change</i>	--	-3.7%	16.4%	54.4%	16.7%	-16.4%	11.0%
Purchased Transportation	\$1,376,264	\$1,519,909	\$1,604,975	\$1,663,154	\$1,519,036	\$1,564,931	--
<i>Annual Change</i>	--	10.4%	5.6%	3.6%	-8.7%	3.0%	2.6%
Casualty/Liability	\$10,103	\$36,531	\$13,970	\$14,411	\$18,213	\$27,214	--
<i>Annual Change</i>	--	261.6%	-61.8%	3.2%	26.4%	49.4%	21.9%
Misc. Expenses (a)	\$6,537	\$6,639	\$6,558	\$7,229	\$8,506	\$8,192	--
<i>Annual Change</i>	--	1.6%	-1.2%	10.2%	17.7%	-3.7%	4.6%
Total	\$1,522,314	\$1,706,945	\$1,789,984	\$1,863,467	\$1,734,428	\$1,771,267	--
<i>Annual Change</i>	--	12.1%	4.9%	4.1%	-6.9%	2.1%	3.1%
OPERATING STATISTICS							
Vehicle Service Hours	18,997	17,232	17,325	17,606	17,584	17,556	--
<i>Annual Change</i>	--	-9.3%	0.5%	1.6%	-0.1%	-0.2%	-1.6%

(a) Includes utilities and misc. expenses

Source: FY2013 -FY2015, prior audit; FY2016 through FY2018 NTD Reports

Exhibit 6.5: Distribution of Component Costs – Rail Shuttle

Operating Cost per Vessel Service Hour



Paratransit Performance Trends

This section provides an overview of the performance of VTA's paratransit service over the six year analysis period. The trends in the TDA indicators and input data are presented in Exhibit 7. The six-year trends are illustrated in Exhibits 7.1 through 7.3. As was noted in the Review of TDA Data Collection and Reporting Methods Section of this report, there were some reporting anomalies concerning vehicle service hours and miles during the current audit period. Those anomalies were attributed to a combination of decreasing ridership, inconsistencies in data collection and reporting by the prior paratransit contractor, and incomplete data resulting from the emergency changeover from the prior contractor to the current paratransit contractor in FY2017.

- Operating Cost per Vehicle Service Hour (Exhibit 7.1)
 - VTA's paratransit cost per hour decreased from \$76.35 in FY2013 to \$65.71 in FY2018.
 - Cost per hour fluctuated over the review period, with increases in FY2015, FY2016 and FY2017, and decreases in FY2014 and FY2018.
 - Overall, the cost per hour decreased an average of three percent per year over the six years.
 - In constant FY2013 dollars, there was an average annual decrease of 5.7 percent over the six years.
- Passengers per Vehicle Service Hour (Exhibit 7.2)
 - Passengers per vehicle service hour decreased over the review period. VTA carried 2.5 passengers per hour in FY2013, but only 1.6 passengers per hour by FY2018.
 - Service hours increased modestly by a 2.5 percent annual average over the period. At the same time, ridership was lower in every year of the audit period, averaging a 6.2 percent annual decrease in unlinked

passengers. This resulted in an average annual decrease of 8.5 percent in passengers per hour.

- Passengers per Vehicle Service Mile (Exhibit 7.2)
 - Performance in passengers per vehicle service mile declined, as passengers per mile decreased from 0.12 in the first three years of the period, to 0.10 in FY2018.
 - The annual decrease in service miles over the period was smaller than the rate of decrease in unlinked passengers. The net effect of these changes was an average annual decrease in this indicator of 4.8 percent.

- Operating Cost per Passenger (Exhibit 7.3)
 - Paratransit cost effectiveness also declined by 6.1 percent per year on average, from \$29.96 per passenger in FY2013 to \$40.23 in FY2018.
 - Operating costs decreased by 0.6 percent per year over the period, while passenger levels decreased by 6.2 percent per year.
 - With the impact of inflation removed, the result was an average annual increase in cost per passenger of 3.1 percent over the six years.

* * * * *

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

- Cost efficiency improved overall, with an average annual decrease in the operating cost per hour of three percent (5.7 percent in inflation adjusted dollars).

- The operating cost per passenger averaged an annual increase of 6.1 percent, or 3.1 percent when normalized in FY2013 dollars. On average, operating costs decreased by 0.6 percent per year over the period, while ridership decreased by 6.2 percent per year.

- Passenger productivity was down, with passengers per hour decreasing an average 8.5 percent annually and passengers per mile decreasing 4.8 percent per year on average.
- As noted previously in this report, there were some reporting anomalies concerning paratransit vehicle service hours and miles during the current audit period. Those anomalies were attributed to a combination of decreasing ridership, inconsistencies in data collection and reporting by the prior paratransit contractor, and incomplete data resulting from the emergency changeover from the prior contractor to the current paratransit contractor in FY2017.

Exhibit 7: TDA Indicator Performance – Paratransit

	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Av. Ann. Chg.
Performance Indicators							
Op. Cost per Vehicle Svc. Hour (Actual \$)	\$76.35	\$70.06	\$74.72	\$68.20	\$78.94	\$65.71	- -
<i>Annual Change</i>	- -	-8.2%	6.6%	-8.7%	15.7%	-16.8%	-3.0%
Op. Cost per Vehicle Svc. Hour (Constant \$)	\$76.35	\$68.11	\$71.30	\$63.51	\$71.19	\$57.00	- -
<i>Annual Change</i>	- -	-10.8%	4.7%	-10.9%	12.1%	-19.9%	-5.7%
Passengers per Vehicle Service Hour	2.5	2.6	2.6	1.9	1.7	1.6	- -
<i>Annual Change</i>	- -	0.1%	0.2%	-24.4%	-13.4%	-2.4%	-8.5%
Passengers per Vehicle Service Mile	0.12	0.12	0.12	0.13	0.11	0.10	- -
<i>Annual Change</i>	- -	-3.9%	3.2%	9.1%	-20.1%	-9.4%	-4.8%
Op. Cost per Passenger (Actual \$)	\$29.96	\$27.47	\$29.23	\$35.28	\$47.15	\$40.23	- -
<i>Annual Change</i>	- -	-8.3%	6.4%	20.7%	33.6%	-14.7%	6.1%
Op. Cost per Passenger (Constant \$)	\$29.96	\$26.70	\$27.89	\$32.85	\$42.52	\$34.89	- -
<i>Annual Change</i>	- -	-10.9%	4.4%	17.8%	29.4%	-17.9%	3.1%
Vehicle Service Hours per FTE	(a)	(a)	(a)	(a)	(a)	(a)	- -
<i>Annual Change</i>	- -	- -	- -	- -	- -	- -	- -
Input Data							
Operating Cost (Actual \$)	\$21,954,919	\$19,987,296	\$20,975,163	\$22,992,692	\$25,530,098	\$21,348,910	- -
<i>Annual Change</i>	- -	-9.0%	4.9%	9.6%	11.0%	-16.4%	-0.6%
Operating Cost (Constant \$)	\$21,954,919	\$19,430,853	\$20,013,093	\$21,410,175	\$23,023,960	\$18,517,286	- -
<i>Annual Change</i>	- -	-11.5%	3.0%	7.0%	7.5%	-19.6%	-3.3%
Vehicle Service Hours	287,569	285,273	280,707	337,134	323,425	324,888	- -
<i>Annual Change</i>	- -	-0.8%	-1.6%	20.1%	-4.1%	0.5%	2.5%
Vehicle Service Miles	5,995,466	6,196,213	5,922,864	4,929,806	5,126,725	5,544,166	- -
<i>Annual Change</i>	- -	3.3%	-4.4%	-16.8%	4.0%	8.1%	-1.6%
Unlinked Passengers	732,793	727,688	717,675	651,679	541,444	530,726	- -
<i>Annual Change</i>	- -	-0.7%	-1.4%	-9.2%	-16.9%	-2.0%	-6.2%
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%

(a) Not applicable as VTA Paratransit service is provided by a private contractor

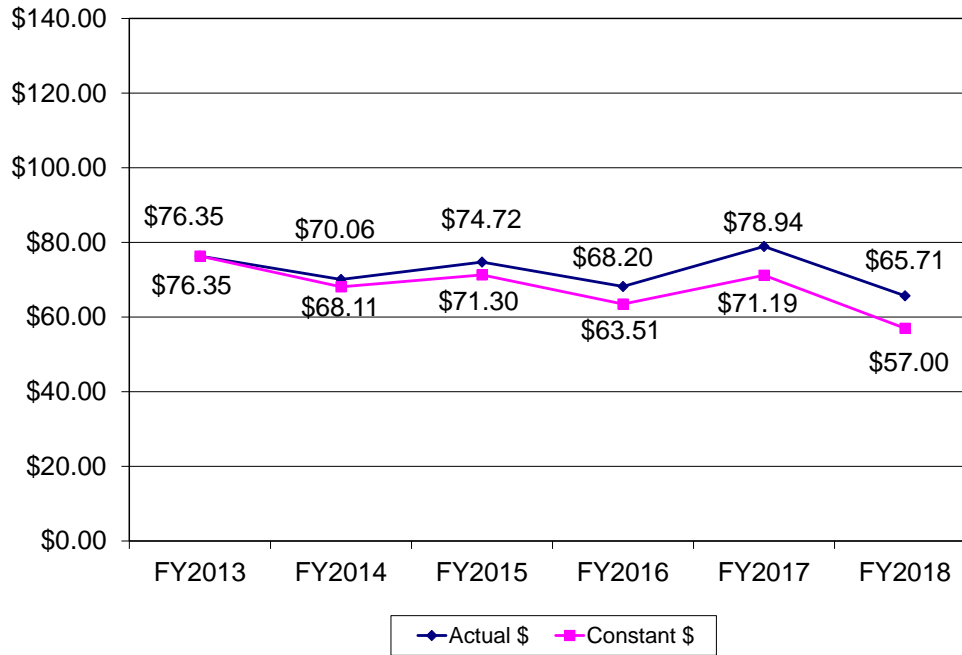
Sources:

FY2013 through FY2015 - Prior Performance Audit Report

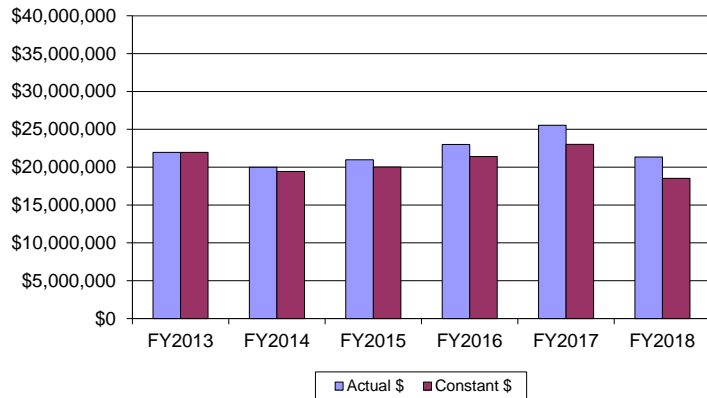
FY2016 through FY2018 - NTD Reports (2018 data is preliminary)

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

Exhibit 7.1: Operating Cost per Vehicle Service Hour – Paratransit



Operating Cost



Vehicle Service Hours

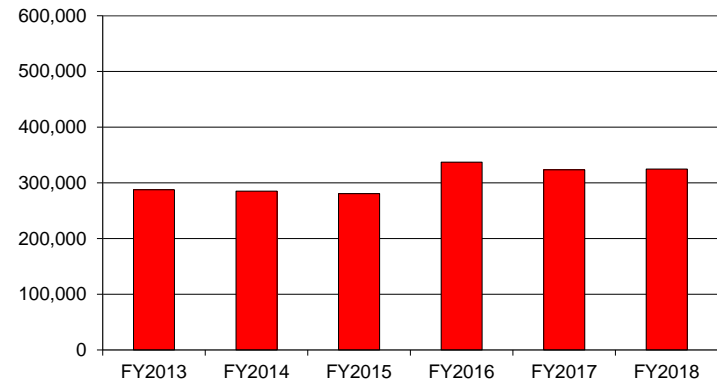
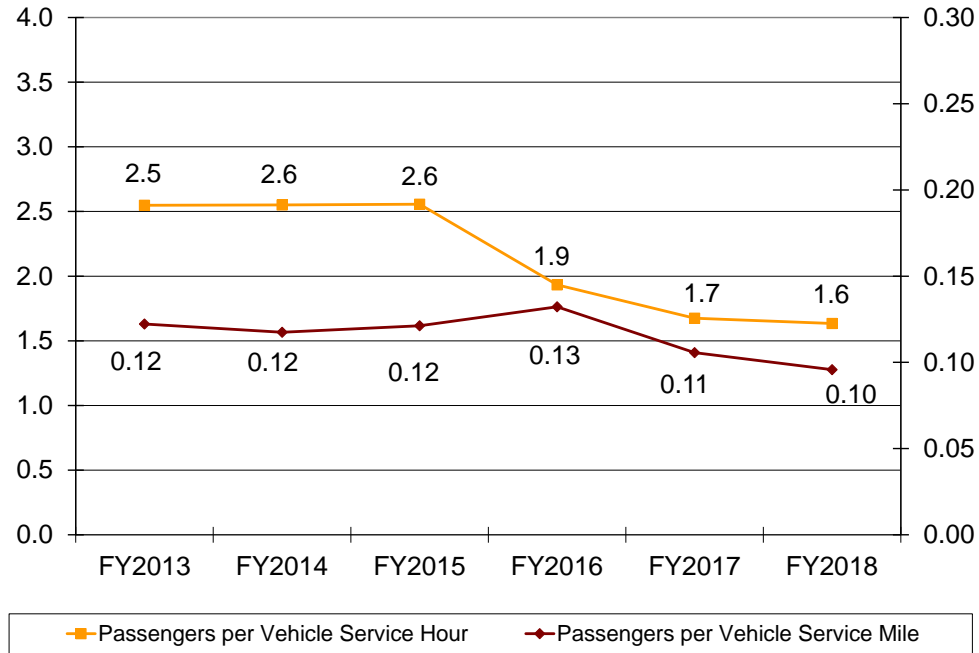
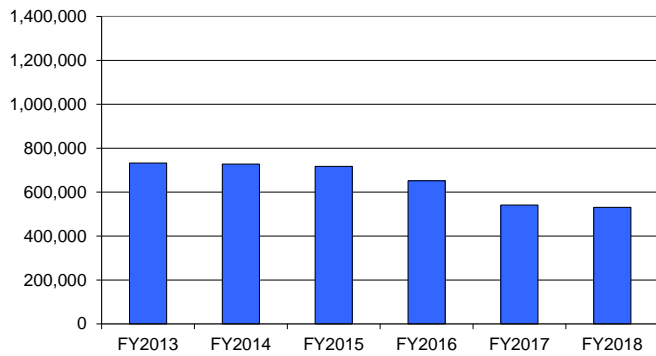


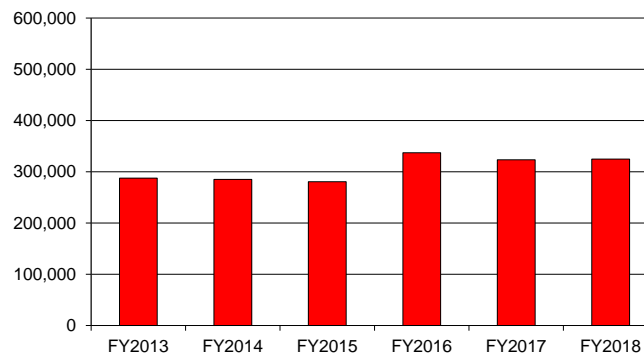
Exhibit 7.2: Passengers per Hour and per Mile – Paratransit



Unlinked Passengers



Vehicle Service Hours



Vehicle Service Miles

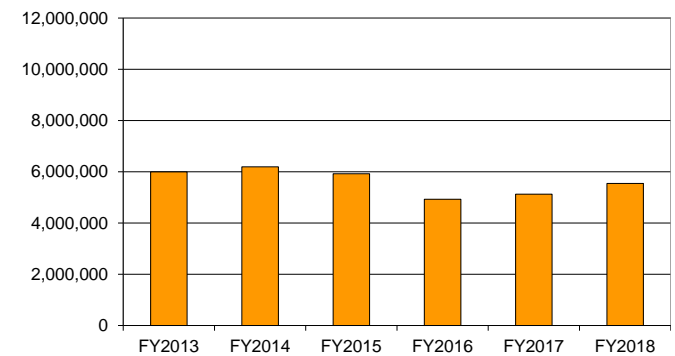
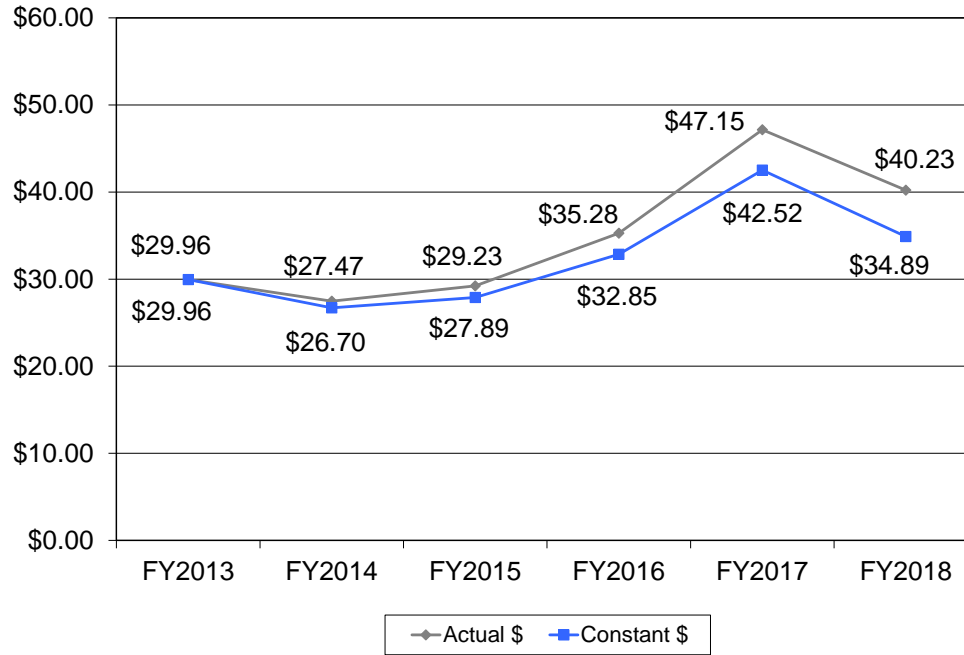
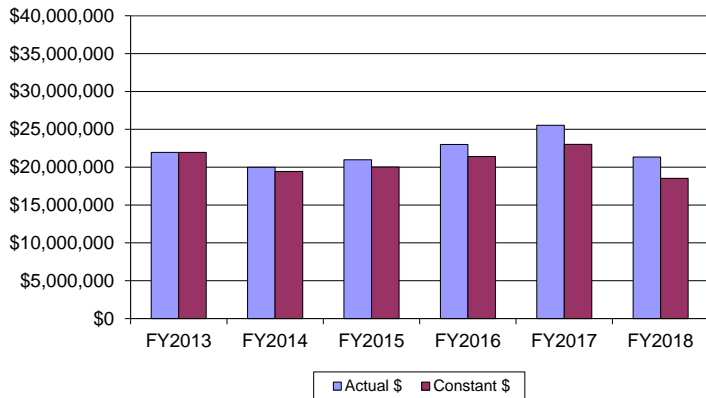


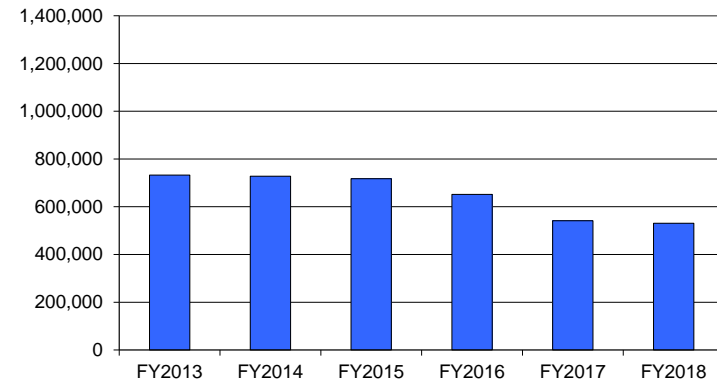
Exhibit 7.3: Operating Cost per Passenger – Paratransit



Operating Cost



Unlinked Passengers



Paratransit Component Costs

Year-to-year changes in selected operating cost categories over the past six years are presented in Exhibit 7.4, along with the concurrent changes in vehicle service hours and the portion of the cost per vehicle service hour that can be attributed to each included cost component. Exhibit 7.5 illustrates the portion of the cost per vehicle service hour that can be attributed to each included cost component.

- Total annual costs decreased by 0.6 percent on average between FY2013 and FY2018. The decrease was driven by relatively unchanged (0.4 percent annual increase) purchased transportation costs over the six-years, mostly due to a 17 percent decrease in in FY2018 offsetting increases in earlier years.
- Purchased transportation costs accounted for between 95 and 99 percent of total operating costs between FY2013 and FY2018. Purchased transportation costs rose in each year of the period, but a 17 percent decrease in in FY2018 kept the overall rise to a minimum level.
- In-house labor costs decreased an average of 17.1 percent annually and fringe benefit costs increased a modest 2.1 percent annually.
- VTA's adoption of a new Indirect Cost Allocation Plan (ICAP) in the last audit period caused a large decrease in labor and fringe costs in the first three years of the period, followed by dramatic cost increases in the current audit period.

* * * * *

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

- Purchased transportation costs, by far the largest component cost category, remained relatively unchanged overall, increasing by 0.4 percent per year on average.

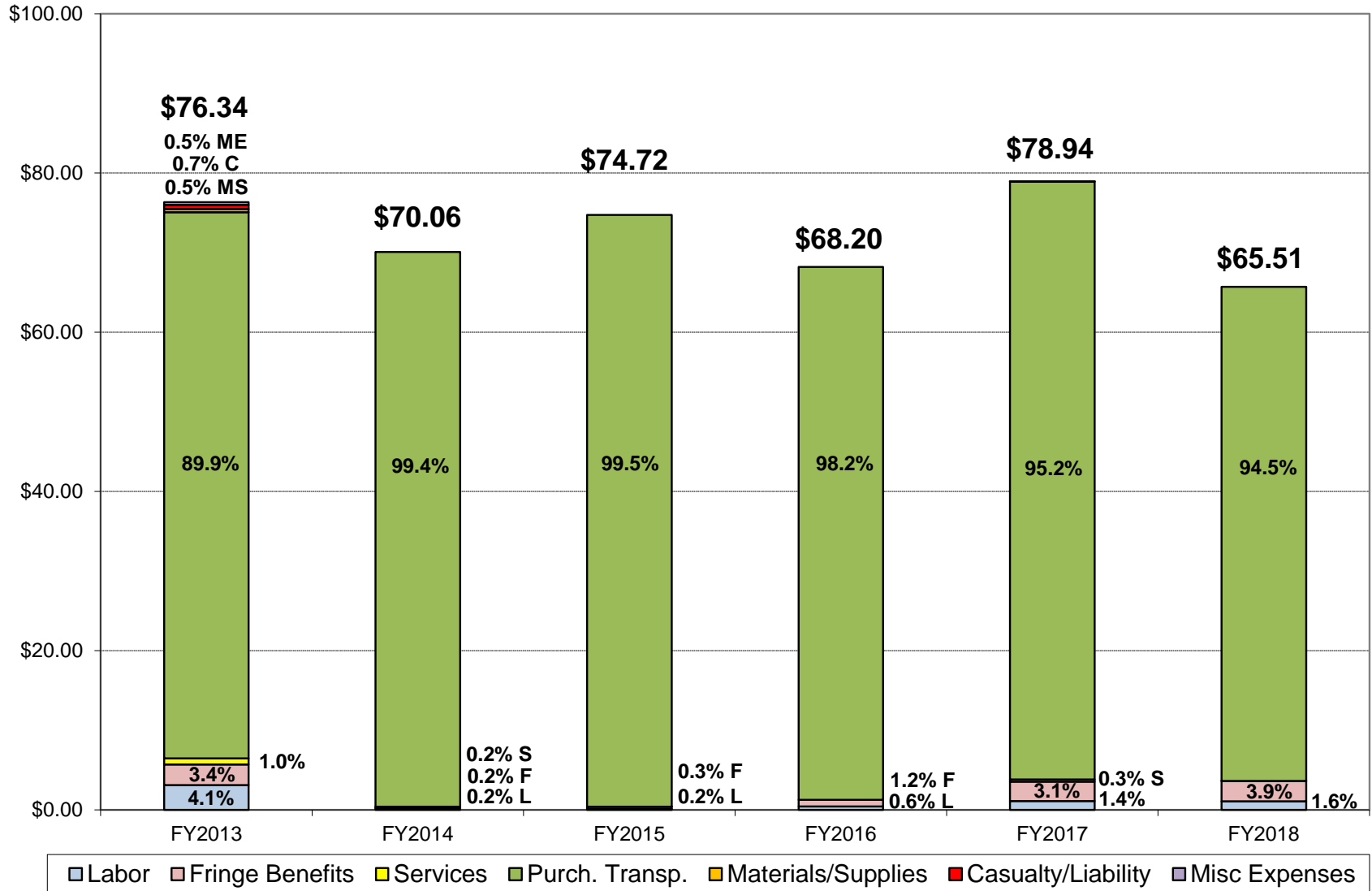
- Significant overall cost reductions occurred in other categories, with labor costs decreasing about 17 percent and services decreasing almost 60 percent per year on average.
- Other categories such as materials/supplies, casualty/liability and miscellaneous cost categories dropped to zero by FY2018, due to VTA establishing a new Indirect Cost Allocation Plan (ICAP), during the prior TDA audit period, that reallocated paratransit costs to other modes.

Exhibit 7.4: TDA Component Costs Trends – Paratransit

	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Av. Ann. Chg.
COST CATEGORIES							
Labor (Salaries/Wages)	\$894,056	\$42,170	\$38,757	\$144,968	\$362,280	\$349,401	--
Annual Change	--	-95.3%	-8.1%	274.0%	149.9%	-3.6%	-17.1%
Fringe Benefits	\$745,442	\$41,780	\$69,975	\$276,257	\$784,876	\$828,781	--
Annual Change	--	-94.4%	67.5%	294.8%	184.1%	5.6%	2.1%
Services	\$217,616	\$33,184	\$19	\$0	\$84,294	\$2,388	--
Annual Change	--	-84.8%	-99.9%	-100.0%	--	-97.2%	-59.4%
Purchased Transportation	\$19,730,291	\$19,870,162	\$20,866,412	\$22,571,467	\$24,292,917	\$20,168,340	--
Annual Change	--	0.7%	5.0%	8.2%	7.6%	-17.0%	0.4%
Materials/Supplies	\$115,469	\$0	\$0	\$0	\$4,684	\$0	--
Annual Change	--	-100.0%	--	--	--	-100.0%	-100.0%
Casualty/Liability	\$152,893	\$0	\$0	\$0	\$0	\$0	--
Annual Change	--	-100.0%	--	--	--	--	-100.0%
Misc. Expenses	\$99,152	\$0	\$0	\$0	\$647	\$0	--
Annual Change	--	-100.0%	--	--	--	-100.0%	-100.0%
Total	\$21,954,919	\$19,987,296	\$20,975,163	\$22,992,692	\$25,529,698	\$21,348,910	--
Annual Change	--	-9.0%	4.9%	9.6%	11.0%	-16.4%	-0.6%
OPERATING STATISTICS							
Vehicle Service Hours	287,589	285,273	280,707	337,134	323,425	324,888	--
Annual Change	--	-0.8%	-1.6%	20.1%	-4.1%	0.5%	2.5%

Source: FY2013 - FY2015, prior audit; FY2016 through FY2018 – NTD Reports

Exhibit 7.5: Distribution of Component Costs – Paratransit
Operating Cost per Vehicle Service Hour



IV. COMPLIANCE WITH PUC REQUIREMENTS

An assessment of VTA'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 VTA's TDA-STA claim application.

The results from this review are detailed by individual requirement in Exhibit 8. VTA is in compliance with the 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, part-time staffing, reduced fares, welfare to work coordination, revenue sharing, and evaluating passenger needs.

Exhibit 8: 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: <ul style="list-style-type: none"> • Cerone: 01/08/2016, 01/05/2017, 03/01/2018 • Chaboya: 10/31/16, 11/09/2017, 02/07/2019 • North: 09/02/2016, 11/02/2017, 01/31/2019
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	<ul style="list-style-type: none"> • No provision for excess staffing in Agreement with ATU Local 265; 9/24/15. • No provision for excess staffing in agreement for Paratransit Service with Outreach and Escort, Inc. 07/01/13. • No provision for excess staffing in contracts between VTA and MV Public Transportation, Inc. 11/03/16 and 07/05/17.
PUC99314.5 (e)(1)(2)	<u>Part Time Drivers</u> - Operators receiving STA funds are not precluded by contract from employing part-time drivers or from contracting with common carriers	In Compliance	<ul style="list-style-type: none"> • Part time employee provisions included in Section 18 of the Agreement with ATU Local 265; 9/24/15. • Contract for paratransit services with MV Public Transportation, Inc., 07/05/17.

Code Reference	Operator Compliance Requirements	Compliance Finding	Verification Information
PUC99155	<p><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.</p>	In Compliance	<p>Fare information in public information material:</p> <ul style="list-style-type: none"> Valley Transportation Authority web site: http://www.vta.org/getting-around/fares
PUC99155.1 (a)(1)(2)	<p><u>Welfare to Work Coordination</u> - Operators must 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</p>	In Compliance	<p>Coordination efforts include:</p> <ul style="list-style-type: none"> VTA has agreements with Santa Clara County for the Transit Assistance Program (TAP), and Universal Pass for Life Improvement from Transportation (UPLIFT) VTA is a stakeholder in the MTC Coordinated Public Transit-Human Services Transportation Plan, directed by MTC as the RTAP and MPO for the Bay Area.

Code Reference	Operator Compliance Requirements	Compliance Finding	Verification Information
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	Valid revenue sharing/transfer agreements with: <ul style="list-style-type: none"> • Clipper Agreement (AC Transit, GGBHTD, BART, SFMTA, SamTrans, Caltrain, CCCTA, FAST, Petaluma, ECCTA, LAVTA, MCTD, NCTPA, SolTrans, SCT, SMART, Vacaville, WCCTA, WETA, Santa Rosa, Union City) • RTC Agreement (AC Transit, GGBHTD, BART, SFMTA, SamTrans, Caltrain, CCCTA, Petaluma, ECCTA, LAVTA, SolTrans, SCT, STA, Santa Rosa) • BART • Capital Corridor Joint Powers Authority (CCJPA) • Monterey-Salinas Transit • Santa Cruz MTD • WETA • San Joaquin Regional Rail Commission

Code Reference	Operator Compliance Requirements	Compliance Finding	Verification Information
PUC99246(d)	<p><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</p>	<p>In Compliance</p>	<p>The following mechanisms are utilized to evaluate passenger needs:</p> <ul style="list-style-type: none"> • VTA Short Range Transit Plans (FY2014- 2023) (FY2018-2027 Draft) • VTA Transit Service Plan (FY2018-19) • VTA Transit Sustainability Policy and Service Design Guidelines (2018 Update) • VTA Express Bus Performance Report (2018) • VTA Fast Transit Program (2018)

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V. PRIOR AUDIT RECOMMENDATIONS

VTA'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 VTA's responses to the recommendations made in the prior performance audit, and whether VTA made reasonable progress toward their implementation. There were three recommendations made in VTA's prior audit. A summary of the recommendations and the actions taken by VTA in response is presented in Exhibit 9. 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.

VTA has implemented corrective actions for all three recommendations from the prior audit.

- In response to the first recommendation for VTA to improve on-time performance, VTA implemented improvements to driver training and instruction programs for bus operators. For light rail, VTA completed several construction projects that hindered schedule adherence, and focused on signal priority for light rail. The results of VTA's efforts included a 0.7 percent overall improvement in bus on-time performance and a 9.3 percent improvement for light rail during the current audit period.
- The second recommendation was to address the negative performance trends in service reliability for both bus and light rail service. VTA is adhering to a consistent preventive maintenance schedule for bus operations, and has been placing more new buses into service, and retiring older buses. VTA added light rail maintenance employees to assist in completing required maintenance on its vehicles, and has completed a required mid-life overhaul maintenance for the majority of its light rail fleet. The result of VTA's efforts has been an almost 20 percent improvement in mean distance between major failures, and a 16 percent improvement in mean distance between all mechanical failures for bus service, and the mean distance between mechanical failures for light rail improved by 1.2 percent overall during the current audit period.
- In response to the third recommendation to address the increase in lost days due to industrial accidents for the light rail service, VTA expanded its employee Health and Wellness Program, expanded the employee safety program to conduct regular safety inspections and monthly safety meetings, and added safety to the supervisor training program. VTA also is tracking long-term disability claims and is providing additional resources to re-integrate employees back into the work force. VTA's efforts have resulted in a 66 percent reduction in lost days due to industrial injuries and accidents for light rail during the current audit period.

Exhibit 9: Status of Prior Audit Recommendations

Recommendation	Actions Taken	Evaluation
<p>1. Continue to monitor efforts to improve on-time performance of the fixed-route bus and light rail service and examine other potential causes of decreased performance.</p>	<p>VTA implemented bus supervisor employee development and best practices, and driver training and instruction programs. For light rail, the completion of several construction projects eliminated “slow zones” that hindered schedule adherence, and focused on signal priority for light rail in several VTA service area cities.</p>	<p>Implemented</p>
<p>2. Develop a plan for addressing the negative performance trend in service reliability of the fixed-route bus and light rail service.</p>	<p>VTA committed itself to adhering to a consistent preventive maintenance schedule for bus operations during the current audit period. VTA also has been placing more new buses into service, and retiring older buses. The result of VTA’s efforts has been an almost 20 percent improvement in mean distance between major failures, and a 16 percent improvement in mean distance between all mechanical failures during the current audit period.</p> <p>For light rail, VTA added light rail maintenance employees to assist in completing required maintenance on its vehicles. VTA also began and has completed the required mid-life overhaul maintenance for the majority of its light rail fleet.</p>	<p>Implemented</p>
<p>3. Address the significant increase in lost days due to industrial accidents for the light rail service.</p>	<p>VTA has expanded its employee Health and Wellness Program, expanded the employee safety program to conduct regular safety inspections and monthly safety meetings, and added safety to the supervisor training program. VTA also is tracking long-term disability claims and is providing additional resources to re-integrate employees back into the work force.</p>	<p>Implemented</p>

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VI. FUNCTIONAL PERFORMANCE

To further assess VTA'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 VTA or for which input data were maintained by VTA 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 the indicators performance systemwide or by mode, each followed by an exhibit illustrating the indicators by function as applicable.

Systemwide

For the purposes of this review, VTA's functional indicators relating to Management, Administration and Marketing have been included generally on a systemwide basis. Audit period performance is discussed below and presented in Exhibit 10.

- Administrative costs averaged between 12 and 13.6 percent of total operating costs, ranging between about \$23 and \$29 per vehicle service hour. The overall three – year trend for administrative cost per hour was up 13.3 percent.
- The portion of administrative costs attributed to marketing activities ranged between about three and four percent for the audit period. Marketing cost per passenger trip ranged from three to six cents each year.
- The systemwide farebox recovery ratio decreased from about 11 percent to about nine percent during the audit period.

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

- Administrative costs ranged between about 12 and 14 percent of total operating costs, averaging between \$23 and \$29 per vehicle service hour.
- Marketing costs averaged between three and four percent of total administrative costs, while the marketing cost per passenger trip ranged from three to six cents each year.
- Systemwide farebox recovery ratio decreased from 11 to nine percent during the audit period.

Exhibit 10: Functional Performance Trends – Systemwide (All Modes)

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
MANAGEMENT, ADMINISTRATION & MARKETING			
Administrative Cost/Total Operating Cost	12.0%	13.7%	13.6%
<i>Annual Percent Change</i>	--	14.7%	-1.2%
<i>Three Year Percent Change</i>	--	--	13.3%
Administrative Cost/Vehicle Service Hour	\$22.57	\$27.44	\$28.92
<i>Annual Percent Change</i>	--	21.6%	5.4%
<i>Three Year Percent Change</i>	--	--	28.2%
Marketing Cost/Total Administrative Cost	2.8%	3.6%	4.0%
<i>Annual Percent Change</i>	--	29.5%	9.3%
<i>Three Year Percent Change</i>	--	--	41.5%
Marketing Cost/Unlinked Passenger Trip	\$0.03	\$0.05	\$0.06
<i>Annual Percent Change</i>	--	77.1%	21.0%
<i>Three Year Percent Change</i>	--	--	114.4%
Farebox Recovery Ratio (Farebox Rev./Oper. Cost)	11.2%	9.3%	8.9%
<i>Annual Percent Change</i>	--	-17.1%	-4.2%
<i>Three Year Percent Change</i>	--	--	-20.7%

Bus Service

VTA's bus service functional area trends represent areas of cost efficiency, safety, productivity and service reliability. Audit period performance is discussed below and presented in Exhibit 11.

- Service Planning
 - Total operating costs per passenger mile increased from \$1.28 in FY2016 to \$1.89 in FY2018 due to increased costs and decreased passenger miles in every year.
 - About 84 percent of all vehicle miles traveled were in service, as were about 92 percent of all vehicle hours in all three years.
 - The bus farebox revenue ratio decreased about 12 percent overall from 11.6 percent in FY2016 to 10.2 percent in FY2018.

- Operations
 - Vehicle operations cost as a percentage of total operating cost averaged between about 60 and 62 percent in each year. The percentage increased a total of 2.2 percent during the audit period.
 - Vehicle operations costs per service hour increased slightly, from \$97.41 in FY2016 to \$104.79 in FY2018.
 - Operator scheduled absences remained steady around seven percent over the audit period, while unscheduled absences ticked up slightly from 7.7 percent in FY2016 to 8.1 percent in FY2018, an increase of about five percent.
 - Schedule adherence remained around 86 percent in in each year of the audit period.
 - The incidence of passenger complaints per 100,000 trips decreased about ten percent from 22.4 complaints in FY2016 to 20 complaints in FY2018.

- There were a small number of commendations each year, and the percentage of missed trips was consistently less than one-half of one percent in each year of the audit period.
- Maintenance
 - Total maintenance costs as a percentage of total operating costs remained steady between 27 and 28 percent over the audit period.
 - Vehicle maintenance costs per service mile increased slightly over the audit period from \$3.73 to \$3.94, just over five percent.
 - Mechanic pay hours decreased slightly over the period from about 35 percent of vehicle service hours to 33 percent.
 - Maintenance employee scheduled absences remained steady at about 7.5 percent each year, but unscheduled absences increased from 6.2 percent to 7.3 percent during the audit period.
 - The vehicle spare ratio decreased from about 21 percent in FY2016 to 19 percent in FY2018.
 - The mean distance between major failures improved overall from about 10,000 miles to almost 12,000 miles between accidents. Distance between all failures increased from about 8,500 miles in FY2016 to almost 10,000 miles in FY2018. This was an overall increase of about 20 and 16 percent, respectively.
- Safety
 - The rate of preventable accidents per 100,000 vehicle miles was very low, less than one per year, down about 35 percent overall during the audit period.
 - Casualty and liability costs per service hour and mile spiked over 80 percent each from FY2016 to FY2018, with casualty/liability cost per hour increasing from \$1.36 to \$2.56, and casualty/liability cost per mile increasing from \$0.13 to \$0.24.

- The number of lost days due to industrial accidents increased almost 30 percent during the audit period, from 3,695 in FY2016 to 4,783 in FY2018.

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

- Service Planning results were mixed overall, as total operating cost per passenger mile increased by 48 percent, reflecting increased costs and lower passenger miles. Vehicle miles and hours in service remained steady at about 84 and 92 percent, respectively, but bus fare recovery ratio decreased 12 percent.
- In Operations, vehicle operations cost increased slightly as a percentage of total operating cost, while vehicle operations cost per service hour increased about 7.5 percent from \$97.41 to \$104.79. Operator scheduled absences remained steady, while unscheduled absences increased about five percent. Schedule adherence remained steady at about 86 percent, while there was an almost 11 percent decrease in passenger complaints per 100,000 boardings. There were very small numbers of passenger commendations and missed trips in all three years.
- Maintenance results found total maintenance costs holding steady at around 27 percent of total operating cost. Vehicle maintenance costs per mile increased just over five percent, while the ratio of mechanic pay hours to vehicle service hours decreased five percent. Scheduled employee absences increased four percent during the audit period, while unscheduled absences increased about 18 percent. Spare ratio decreased from 22 to just under 19 percent. Service reliability improved with mean distance between failures increasing more than 15 percent for both major and total failures during the audit period.
- Safety results demonstrated miles between preventable accidents decreasing slightly overall. A significant increase occurred in casualty and liability costs per service mile and hour during the period, and lost days due to industrial accidents increased almost 30 percent.

Exhibit 11: Functional Performance Trends – Bus Service

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
SERVICE PLANNING			
Total Operating Cost/Passenger Mile	\$1.28	\$1.65	\$1.89
<i>Annual Percent Change</i>	--	29.4%	14.4%
<i>Three Year Percent Change</i>	--	--	48.1%
Vehicle Service Miles/Total Miles	83.6%	83.5%	83.6%
<i>Annual Percent Change</i>	--	-0.1%	0.1%
<i>Three Year Percent Change</i>	--	--	0.0%
Vehicle Service Hours/Total Hours	91.8%	91.7%	91.8%
<i>Annual Percent Change</i>	--	-0.2%	0.2%
<i>Three Year Percent Change</i>	--	--	0.0%
Farebox Recovery Ratio (Farebox Rev./Oper. Cost)	11.6%	10.7%	10.2%
<i>Annual Percent Change</i>	--	-7.8%	-4.5%
<i>Three Year Percent Change</i>	--	--	-12.0%
OPERATIONS			
Vehicle Operations Cost/Total Operating Cost	60.2%	59.7%	61.5%
<i>Annual Percent Change</i>	--	-0.8%	3.0%
<i>Three Year Percent Change</i>	--	--	2.2%
Vehicle Operations Cost/Vehicle Service Hour	\$100.42	\$100.62	\$107.29
<i>Annual Percent Change</i>	--	0.2%	6.6%
<i>Three Year Percent Change</i>	--	--	6.8%
Operator Sched. Absences/Total Hours Worked	7.0%	7.0%	6.8%
<i>Annual Percent Change</i>	--	-0.3%	-2.1%
<i>Three Year Percent Change</i>	--	--	-2.4%
Operator Unsched. Absences/Total Hours Worked	7.7%	7.6%	8.1%
<i>Annual Percent Change</i>	--	-1.5%	6.5%
<i>Three Year Percent Change</i>	--	--	4.9%
Trips On-Time/Total Trips	85.8%	86.3%	86.4%
<i>Annual Percent Change</i>	--	0.6%	0.1%
<i>Three Year Percent Change</i>	--	--	0.7%
Complaints/100,000 Unlinked Passenger Trips	22.4	23.9	20.0
<i>Annual Percent Change</i>	--	6.6%	-16.4%
<i>Three Year Percent Change</i>	--	--	-10.8%
Commendations/100,000 Unlinked Passenger Trips	0.00	0.22	0.21
<i>Annual Percent Change</i>	--	7102.1%	-6.0%
<i>Three Year Percent Change</i>	--	--	6672.3%
Missed Trips/Total Trips	0.4%	0.4%	0.3%
<i>Annual Percent Change</i>	--	-7.3%	-10.5%
<i>Three Year Percent Change</i>	--	--	-17.1%

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
MAINTENANCE			
Vehicle + Non-Veh. Maint. Cost/Total Operating Cost	27.5%	27.5%	26.5%
<i>Annual Percent Change</i>	--	-0.1%	-3.5%
<i>Three Year Percent Change</i>	--	--	-3.5%
Vehicle Maintenance Cost/Vehicle Service Mile	\$3.73	\$3.82	\$3.94
<i>Annual Percent Change</i>	--	2.2%	3.4%
<i>Three Year Percent Change</i>	--	--	5.6%
Maintenance Pay Hours/Vehicle Service Hours	34.7%	34.7%	32.9%
<i>Annual Percent Change</i>	--	0.0%	-5.1%
<i>Three Year Percent Change</i>	--	--	-5.1%
Maintenance Employee Scheduled Absences	7.3%	7.0%	7.6%
<i>Annual Percent Change</i>	--	-3.8%	8.1%
<i>Three Year Percent Change</i>	--	--	4.1%
Maintenance Employee Unscheduled Absences	6.2%	7.0%	7.3%
<i>Annual Percent Change</i>	--	13.4%	3.9%
<i>Three Year Percent Change</i>	--	--	17.8%
Spare Vehicles/Total Vehicles	21.4%	15.4%	18.6%
<i>Annual Percent Change</i>	--	-28.0%	20.8%
<i>Three Year Percent Change</i>	--	--	-13.1%
Mean Distance between Major Failures (Miles)	9,782	10,538	11,727
<i>Annual Percent Change</i>	--	7.7%	11.3%
<i>Three Year Percent Change</i>	--	--	19.9%
Mean Distance between All Failures (Miles)	8,446	8,729	9,793
<i>Annual Percent Change</i>	--	3.3%	12.2%
<i>Three Year Percent Change</i>	--	--	15.9%
SAFETY			
Preventable Accidents/100,000 Vehicle Miles	0.03	0.01	0.02
<i>Annual Percent Change</i>	--	-67.1%	98.0%
<i>Three Year Percent Change</i>	--	--	-34.9%
Casualty & Liability Cost/Vehicle Service Hour	\$1.36	\$1.72	\$2.56
<i>Annual Percent Change</i>	--	26.0%	48.6%
<i>Three Year Percent Change</i>	--	--	87.2%
Casualty & Liability Cost/Vehicle Service Mile	\$0.13	\$0.17	\$0.24
<i>Annual Percent Change</i>	--	25.4%	47.6%
<i>Three Year Percent Change</i>	--	--	85.1%
Lost Days Due to Industrial Accidents	3,695	4,689	4,793
<i>Annual Percent Change</i>	--	26.9%	2.2%
<i>Three Year Percent Change</i>	--	--	29.7%

Light Rail Service

VTA's light rail service 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 \$1.69 in FY2016 to \$2.74 in FY2018, about a 62 percent increase. This reflects consistently rising costs with declining passenger miles in each year.
 - About 92 percent of all vehicle miles and vehicle hours traveled were in service in all three years.
 - The light rail farebox recovery ratio decreased almost 39 percent overall from 10.2 percent in FY2016 to 6.2 percent in FY2018.

- Operations
 - Vehicle operations cost as a percentage of total operating cost decreased about 15 percent during the audit period, from 38 percent to 32 percent.
 - Vehicle operations costs per car service hour increased each year, from \$218.06 in FY2016 to \$259.39 in FY2018. Overall costs per hour increased almost 62 percent.
 - Operator scheduled absences remained steady at about seven percent throughout the period, but unscheduled absences increased slightly from eight to 8.6 percent.
 - Schedule adherence improved from 77.5 percent to 84.7 percent during the audit period.
 - The incidence of passenger complaints per 100,000 boardings decreased from 16.8 to 14 between FY2016 and FY2018.

- As with bus service, the number of passenger commendations and percentage of missed trips completed was consistently very small throughout the audit period.
- Maintenance
 - Total maintenance costs as a percentage of total operating costs increased about five percent from 50.6 to 53.2 percent over the audit period.
 - Vehicle maintenance costs per car service mile increased significantly over the audit period from \$7.94 to \$12.36, a 56 percent rise, reflecting increasing maintenance costs and declining service miles each year.
 - Mechanic pay hours increased about two percent over the period from about 111 percent of car service hours to 114 percent.
 - Maintenance employee scheduled absences remained unchanged during the audit period, while unscheduled absences decreased slightly from 4.9 to 4.5 percent during the three years.
 - The vehicle spare ratio decreased from 40 percent in the first two years to about 38 percent in the last year.
 - VTA reports all light rail mechanical failures in NTD as major failures. The mean distance between failures increased slightly, by 1.2 percent overall. Distance between failures increased from 39,465 to 39,922 over the audit period.
- Safety
 - Preventable accidents per 100,000 car miles was unchanged at 0.03 in each year.
 - Casualty and liability cost per vehicle service hour and mile was similar to the bus service results, with substantial increases over the audit period. Casualty/liability cost per service hour increased from \$3.54 in FY2016 to \$10.15 in FY2018 (186 percent), while cost per service mile increased from \$0.22 to \$0.68 (202 percent) at the same time.

- The number of lost days due to industrial accidents decreased 66 percent during the audit period, from 1,702 in FY2016 to 578 in FY2015.

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

- Service Planning results revealed both vehicle miles and hours in service of about 92 percent of total hours. There was a 62 percent increase in the cost per passenger mile, reflecting a trend of increasing costs and decreasing ridership. Farebox recovery ratio decreased from ten percent to six percent.
- Operations results included a decrease in vehicle operations cost as a percentage of total operating cost, but a 19 percent increase in vehicle operations costs per service hour. Operator scheduled absences were almost unchanged, but unscheduled absences increased just over seven percent overall. Schedule adherence improved 9.3 percent over the audit period from 77.5 to 84.7 percent. Passenger complaints decreased 17 percent during the period from 16.8 to 14 per 100,000 boardings. There were very few passenger commendations and missed trips during the audit period.
- In Maintenance, total maintenance costs rose five percent as a percentage of total operating cost. Vehicle maintenance costs per service mile increased 56 percent, reflecting increased costs and reduced service levels. The ratio of mechanic pay hours to car service hours increased two percent. Employee scheduled absences were almost unchanged while unscheduled absences decreased almost nine percent over the audit period. The vehicle spare ratio decreased about five percent and the mechanical failure rate improved by 1.2 percent overall.
- For Safety, preventable accidents per 100,000 remained unchanged during the audit period. Casualty and liability costs per service hour and service mile increased significantly, by about 186 percent and 203 percent overall, respectively. Lost days due to industrial accidents decreased by 66 percent

during the audit period, the result of VTA implementing a recommendation from the prior audit.

Exhibit 12: Functional Performance Trends – Light Rail Service

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
SERVICE PLANNING			
Total Operating Cost/Passenger Mile	\$1.69	\$2.21	\$2.74
<i>Annual Percent Change</i>	--	30.8%	23.8%
<i>Three Year Percent Change</i>	--	--	61.9%
Car Service Miles/Total Miles	92.6%	92.4%	92.3%
<i>Annual Percent Change</i>	--	-0.1%	-0.2%
<i>Three Year Percent Change</i>	--	--	-0.3%
Car Service Hours/Total Hours	92.0%	92.3%	92.4%
<i>Annual Percent Change</i>	--	0.3%	0.2%
<i>Three Year Percent Change</i>	--	--	0.5%
Farebox Recovery Ratio (Farebox Rev./Oper. Cost)	10.2%	7.6%	6.2%
<i>Annual Percent Change</i>	--	-25.3%	-17.9%
<i>Three Year Percent Change</i>	--	--	-38.7%
OPERATIONS			
Vehicle Operations Cost/Total Operating Cost	38.0%	35.2%	32.2%
<i>Annual Percent Change</i>	--	-7.4%	-8.3%
<i>Three Year Percent Change</i>	--	--	-15.1%
Vehicle Operations Cost/Car Service Hour	\$231.97	\$248.58	\$270.94
<i>Annual Percent Change</i>	--	7.2%	9.0%
<i>Three Year Percent Change</i>	--	--	16.8%
Operator Sched. Absences/Total Hours Worked	7.0%	7.1%	7.1%
<i>Annual Percent Change</i>	--	1.1%	-0.1%
<i>Three Year Percent Change</i>	--	--	1.0%
Operator Unsched. Absences/Total Hours Worked	8.0%	8.4%	8.6%
<i>Annual Percent Change</i>	--	4.8%	2.3%
<i>Three Year Percent Change</i>	--	--	7.3%
Trips On-Time/Total Trips	77.5%	84.3%	84.7%
<i>Annual Percent Change</i>	--	8.8%	0.5%
<i>Three Year Percent Change</i>	--	--	9.3%
Complaints/100,000 Unlinked Passenger Trips	16.8	14.7	14.0
<i>Annual Percent Change</i>	--	-12.6%	-5.1%
<i>Three Year Percent Change</i>	--	--	-17.0%
Commendations/100,000 Unlinked Passenger Trips	0.3	0.4	0.4
<i>Annual Percent Change</i>	--	13.9%	-2.4%
<i>Three Year Percent Change</i>	--	--	11.2%
Missed Trips/Total Trips	0.03%	0.04%	0.32%
<i>Annual Percent Change</i>	--	31.4%	706.7%
<i>Three Year Percent Change</i>	--	--	960.2%

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
MAINTENANCE			
Vehicle + Non-Veh. Maint. Cost/Total Operating Cost	50.6%	53.0%	53.2%
<i>Annual Percent Change</i>	--	4.8%	0.3%
<i>Three Year Percent Change</i>	--	--	5.1%
Vehicle Maintenance Cost/Car Service Mile	\$7.94	\$10.13	\$12.39
<i>Annual Percent Change</i>	--	27.5%	22.4%
<i>Three Year Percent Change</i>	--	--	56.0%
Maintenance Pay Hours/Car Service Hours	111.3%	114.6%	113.6%
<i>Annual Percent Change</i>	--	2.9%	-0.9%
<i>Three Year Percent Change</i>	--	--	2.0%
Maintenance Employee Scheduled Absences	6.3%	6.0%	6.3%
<i>Annual Percent Change</i>	--	-5.5%	5.4%
<i>Three Year Percent Change</i>	--	--	-0.4%
Maintenance Employee Unscheduled Absences	4.9%	5.5%	4.5%
<i>Annual Percent Change</i>	--	10.2%	-17.3%
<i>Three Year Percent Change</i>	--	--	-8.8%
Spare Cars/Total Cars	40.4%	40.4%	38.4%
<i>Annual Percent Change</i>	--	0.0%	-5.0%
<i>Three Year Percent Change</i>	--	--	-5.0%
Mean Distance between Major Failures (Miles)	39,465	43,137	39,922
<i>Annual Percent Change</i>	--	9.3%	-7.5%
<i>Three Year Percent Change</i>	--	--	1.2%
Mean Distance between All Failures (Miles)	39,465	43,137	39,922
<i>Annual Percent Change</i>	--	9.3%	-7.5%
<i>Three Year Percent Change</i>	--	--	1.2%
SAFETY			
Preventable Accidents/100,000 Car Miles	0.03	0.03	0.03
<i>Annual Percent Change</i>	--	3.5%	0.9%
<i>Three Year Percent Change</i>	--	--	4.3%
Casualty & Liability Cost/Car Service Hour	\$3.54	\$5.00	\$10.15
<i>Annual Percent Change</i>	--	41.2%	102.7%
<i>Three Year Percent Change</i>	--	--	186.3%
Casualty & Liability Cost/Car Service Mile	\$0.22	\$0.32	\$0.68
<i>Annual Percent Change</i>	--	45.6%	107.8%
<i>Three Year Percent Change</i>	--	--	202.7%
Lost Days Due to Industrial Accidents	1,702	1,542	578
<i>Annual Percent Change</i>	--	-9.4%	-62.5%
<i>Three Year Percent Change</i>	--	--	-66.0%

Rail Shuttle Service

VTA's rail shuttle service functional area trends represent mostly similar areas to the bus service. Audit period performance is discussed below and presented in Exhibit 13.

- Service Planning
 - VTA's rail shuttle operating cost per passenger mile decreased almost five percent from \$1.19 in FY2016 to \$1.13 in FY2018.
 - Vehicle service miles of total miles traveled decreased from 82.4 percent to 81.8 percent, while vehicle service hours of total hours was almost unchanged at about 91 percent during the audit period.
 - As the rail shuttle are a fare free service, the farebox recovery ratio is not applicable for this section of the audit.

- Operations
 - Vehicle operations costs as a percentage of total costs increased from 49.5 percent in FY2016 to 54.4 percent in FY2018, an almost ten percent increase.
 - Vehicle operation cost per service hour increased about five percent overall, from \$52.39 to \$54.85 during the audit period.
 - The number of complaints per 10,000 passenger trips was less than one for all three years. There was one commendation reported in FY2016, and none reported for the last two years.
 - Data for on-time percentage and missed trips was unavailable. As the shuttle service is linked to the ACE commuter rail system, the rail schedule has significant influence on the commuter shuttle schedule in terms of delays, missed trips, etc. The contractor is solely responsible for shuttle operations and does not track this data.

- Maintenance
 - Total maintenance costs as a percentage of total operating costs decreased from 29.7 percent to 25 percent during the audit period.
 - Vehicle maintenance costs per service mile decreased just over five percent, from \$2.13 in FY2016 to \$2.01 in FY2018.
 - The vehicle spare ratio dipped slightly from 8.3 percent to 7.7 percent over the three-year period.
 - Service reliability improved, with the mean distance between major failures increasing almost 100 percent, and distance between all failures increasing almost 300 percent during the audit period. In real numbers, there were no major failures reported for both FY2017 and FY2018

- Safety
 - VTA did not report any preventable accidents during the current audit period.

* * * * *

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

- Service Planning results showed minor reductions in performance in vehicle miles and hours in service. Total operating cost per passenger mile decreased about five percent overall.
- Operations exhibited about a ten percent increase in vehicle operations costs as a percentage of total operating cost. Vehicle operations cost per service hour increased about five percent. There were very few complaints and commendations per 10,000 passengers throughout the audit period. Data for on-time performance and missed trips was unavailable. The shuttle contractor is responsible for shuttle operations and does not track that data, as it is heavily influenced by the ACE commuter rail service schedules and performance.

- Maintenance results revealed vehicle maintenance costs decreased as a percentage of total costs, as did maintenance cost per vehicle service mile. The spare ratio was mostly stable, remaining at less than nine percent throughout the period. There was significant improvement in mechanical failure rates.
- VTA did not report any preventable accidents during the current audit period.

Exhibit 13: Functional Performance Trends – Rail Shuttle

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
SERVICE PLANNING			
Total Operating Cost/Passenger Mile	\$1.19	\$1.16	\$1.13
<i>Annual Percent Change</i>	--	-2.8%	-2.2%
<i>Three Year Percent Change</i>	--	--	-4.9%
Farebox Recovery Ratio (Farebox Rev./Oper. Cost)	(a)	(a)	(a)
<i>Annual Percent Change</i>	--	--	--
<i>Three Year Percent Change</i>	--	--	--
Vehicle Service Miles/Total Miles	82.4%	82.3%	81.8%
<i>Annual Percent Change</i>	--	-0.1%	-0.6%
<i>Three Year Percent Change</i>	--	--	-0.7%
Vehicle Service Hours/Total Hours	91.3%	91.3%	91.2%
<i>Annual Percent Change</i>	--	0.1%	-0.2%
<i>Three Year Percent Change</i>	--	--	-0.1%
OPERATIONS			
Vehicle Operations Cost/Total Operating Cost	49.5%	47.6%	54.4%
<i>Annual Percent Change</i>	--	-3.8%	14.2%
<i>Three Year Percent Change</i>	--	--	9.8%
Vehicle Operations Cost/Vehicle Service Hour	\$52.39	\$46.97	\$54.85
<i>Annual Percent Change</i>	--	-10.3%	16.8%
<i>Three Year Percent Change</i>	--	--	4.7%
On-Time Percentage	(b)	(b)	(b)
<i>Annual Percent Change</i>	--	--	--
<i>Three Year Percent Change</i>	--	--	--
Complaints/10,000 Unlinked Passenger Trips	0.26	0.27	0.14
<i>Annual Percent Change</i>	--	5.3%	-47.8%
<i>Three Year Percent Change</i>	--	--	-45.0%
Commendations/10,000 Unlinked Passenger Trips	0.02	0.00	0.00
<i>Annual Percent Change</i>	--	-100.0%	--
<i>Three Year Percent Change</i>	--	--	-100.0%
Missed Trips/Total Trips	(b)	(b)	(b)
<i>Annual Percent Change</i>	--	--	--
<i>Three Year Percent Change</i>	--	--	--

(a) Not applicable

(b) Not available

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
MAINTENANCE			
Vehicle + Non-Veh. Maint. Cost/Total Operating Cost	29.7%	34.1%	25.0%
<i>Annual Percent Change</i>	--	14.8%	-26.5%
<i>Three Year Percent Change</i>	--	--	-15.7%
Vehicle Maintenance Cost/Vehicle Service Mile	\$2.13	\$2.04	\$2.01
<i>Annual Percent Change</i>	--	-4.4%	-1.2%
<i>Three Year Percent Change</i>	--	--	-5.6%
Spare Vehicles/Total Vehicles	8.3%	8.3%	7.7%
<i>Annual Percent Change</i>	--	0.0%	-7.7%
<i>Three Year Percent Change</i>	--	--	-7.7%
Mean Distance between Major Failures (Miles)	117,488	230,183	230,465
<i>Annual Percent Change</i>	--	95.9%	0.1%
<i>Three Year Percent Change</i>	--	--	96.2%
Mean Distance between All Failures (Miles)	58,744	115,092	230,465
<i>Annual Percent Change</i>	--	95.9%	100.2%
<i>Three Year Percent Change</i>	--	--	292.3%
SAFETY			
Preventable Accidents/100,000 Vehicle Miles	(a)	(a)	(a)
<i>Annual Percent Change</i>	--	--	--
<i>Three Year Percent Change</i>	--	--	--

(a) No preventable accidents reported during audit period

Paratransit

VTA's paratransit functional area trends represent mostly similar areas to the bus service. Audit period performance is discussed below and presented in Exhibit 14.

- Service Planning
 - VTA's paratransit operating cost per passenger mile decreased just over three percent from \$3.49 in FY2016 to \$3.37 in FY2018.
 - Vehicle service miles of total miles traveled decreased from 89 percent to 87 percent and vehicle services hours decreased from 90 percent to 81 percent during the audit period.
 - The paratransit farebox recovery ratio also decreased from 12 percent to just under ten percent.

- Operations
 - Vehicle operations cost as a percentage of total operating cost decreased 28.2 percent overall from about 88 percent in FY2016 to 63 percent in FY2018.
 - Operating costs per vehicle service hour declined about the same percentage from \$59.93 to \$41.45, an almost 31 percent decrease.
 - Schedule adherence dipped slightly from about 91 percent to 88 percent, but the incidence of complaints per 10,000 passengers increased significantly throughout the audit period, from 6.8 in FY2016 to 24.7 in FY2018.
 - The number of missed trips was less than one percent of total trips reported for the period, and no ADA trip denials were reported for each year.
 - VTA did not report data for total trip cancellations during the current audit period.

- Late trip cancellations and passenger no-shows as a percentage of total ADA trips both increased significantly by over 600 percent and 400 percent, respectively. Late cancellations and no-shows each comprised about two and three percent of the total trips provided by FY2018.
- Maintenance
 - Total maintenance costs as a percentage of total operating cost increased from four percent to ten percent during the audit period, while Vehicle maintenance costs per service mile doubled from \$0.17 to \$0.34.
 - The change in paratransit contractors in FY2017 likely had an impact on maintenance costs during the current audit period.
 - The vehicle spare ratio increased significantly from 1.3 percent to 33.5 percent over the three-year period, again, likely influenced by the change in contractors in FY2017.
 - The mean distance between major failures increased significantly, more than 130 percent over the audit period. The trend when looking at distance between all failures also improved, increasing over 38 percent during the audit period.
- Safety
 - Data for preventable accidents was unavailable during the current audit period. As the paratransit service is contracted, the contractor is liable for all accidents, and therefore, accident data is not tracked.

* * * * *

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

- Service Planning results were mixed, with total operating cost per passenger mile decreasing slightly during the audit period, performance in vehicle miles and hours in service declining by about three and ten percent,

respectively, and farebox recovery ratio decreasing from 12 percent to 9.6 percent.

- Operations results included about a 28 percent decrease in vehicle operations cost as a percentage of total costs, and the cost per service hour decreasing by almost 31 percent. Schedule adherence dipped slightly from about 91 percent to 88 percent, but complaints per 10,000 passengers more than tripled from 6.8 to 24.7 per year. There were no ADA trip denials reported and less than one percent of missed trips per total trips were reported during the audit period. Late trip cancellations and passenger no-shows as a percentage of total ADA trips both increased significantly over the audit period, from less than one percent in FY2016 to 1.7 and three percent respectively. VTA did not report data for total trip cancellations per total number of ADA trips provided during the audit period.
- Maintenance results showed vehicle maintenance costs increasing over the audit period, with maintenance costs rising from four percent to 10.2 percent of total operating costs, and vehicle maintenance cost per service mile doubling from \$0.17 to \$0.34. The spare ratio increased significantly from 1.3 to 33.5 percent, and there as significant improvement in mechanical failure rates. The increase in maintenance costs and vehicle spare ratio were likely influenced by the emergency change in paratransit contractors in FY2017.
- VTA does not track preventable accident data, as the paratransit contractor is liable for all accidents that occur in the paratransit service.

Exhibit 14: Functional Performance Trends – Paratransit

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
SERVICE PLANNING			
Total Operating Cost/Passenger Mile	\$3.49	\$4.56	\$3.37
<i>Annual Percent Change</i>	--	30.9%	-26.2%
<i>Three Year Percent Change</i>	--	--	-3.4%
Vehicle Service Miles/Total Miles	89.3%	101.3%	86.9%
<i>Annual Percent Change</i>	--	13.4%	-14.2%
<i>Three Year Percent Change</i>	--	--	-2.7%
Vehicle Service Hours/Total Hours	90.4%	97.1%	81.3%
<i>Annual Percent Change</i>	--	7.4%	-16.3%
<i>Three Year Percent Change</i>	--	--	-10.1%
Farebox Revenue/Operating Cost	12.0%	7.1%	9.6%
<i>Annual Percent Change</i>	--	-41.2%	35.3%
<i>Three Year Percent Change</i>	--	--	-20.4%
OPERATIONS			
Vehicle Operations Cost/Total Operating Cost	87.9%	63.5%	63.1%
<i>Annual Percent Change</i>	--	-27.8%	-0.6%
<i>Three Year Percent Change</i>	--	--	-28.2%
Vehicle Operations Cost/Vehicle Service Hour	\$59.93	\$50.09	\$41.45
<i>Annual Percent Change</i>	--	-16.4%	-17.2%
<i>Three Year Percent Change</i>	--	--	-30.8%
On-Time Performance	90.9%	91.9%	87.7%
<i>Annual Percent Change</i>	--	1.1%	-4.6%
<i>Three Year Percent Change</i>	--	--	-3.5%
Complaints/10,000 Unlinked Passenger Trips	6.8	18.4	24.7
<i>Annual Percent Change</i>	--	172.5%	34.4%
<i>Three Year Percent Change</i>	--	--	266.1%
Missed Trips/Total Trips	0.0%	0.1%	0.1%
<i>Annual Percent Change</i>	--	--	162.3%
<i>Three Year Percent Change</i>	--	--	--
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	(a)	(a)	(a)
<i>Annual Percent Change</i>	--	--	--
<i>Three Year Percent Change</i>	--	--	--
Late Trip Cancellations/Total ADA Trips	0.2%	0.7%	1.7%
<i>Annual Percent Change</i>	--	195.2%	153.4%
<i>Three Year Percent Change</i>	--	--	648.0%
No-Shows/Total ADA Trips	0.5%	2.0%	3.0%
<i>Annual Percent Change</i>	--	272.9%	51.4%
<i>Three Year Percent Change</i>	--	--	464.6%

(a) Not Available

FUNCTION/Indicator	Actual Performance		
	FY2016	FY2017	FY2018
MAINTENANCE			
Vehicle + Non-Veh. Maint. Cost/Total Operating Cost	4.0%	5.9%	10.2%
<i>Annual Percent Change</i>	--	46.9%	71.7%
<i>Three Year Percent Change</i>	--	--	152.2%
Vehicle Maintenance Cost/Vehicle Service Mile	\$0.17	\$0.26	\$0.34
<i>Annual Percent Change</i>	--	55.6%	30.0%
<i>Three Year Percent Change</i>	--	--	102.3%
Spare Vehicles/Total Vehicles	1.3%	30.6%	33.5%
<i>Annual Percent Change</i>	--	2215.8%	9.3%
<i>Three Year Percent Change</i>	--	--	2431.3%
Mean Dist. betw. Major Failures (Miles)	2,761,106	2,531,063	6,382,567
<i>Annual Percent Change</i>	--	-8.3%	152.2%
<i>Three Year Percent Change</i>	--	--	131.2%
Mean Dist. betw. All Failures (Miles)	230,092	194,697	319,128
<i>Annual Percent Change</i>	--	-15.4%	63.9%
<i>Three Year Percent Change</i>	--	--	38.7%
SAFETY			
Preventable Accidents/100,000 Vehicle Miles	(a)	(a)	(a)
<i>Annual Percent Change</i>	--	--	--
<i>Three Year Percent Change</i>	--	--	--

(a) Not recorded - contractor owns all vehicles and is liable for any accidents

VII. CONCLUSIONS AND RECOMMENDATIONS

This report has presented the findings of the performance audit of VTA's transit service performance during the three-year period of FY2016 through FY2018 (July 1, 2015 through June 30, 2018). It has focused on TDA compliance issues including trends in TDA-mandated performance indicators and compliance with selected sections of the state Public Utilities Code (PUC). It also provided the findings from an overview of VTA'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 – VTA is in compliance with the definition and methodology for collection and reporting of TDA statistics, although data reporting anomalies were noted during the audit review.
 - Some data reporting anomalies were found in the light rail and paratransit services. In the light rail service, employee full-time equivalents (FTEs) exhibited a significant increase between FY2015 and FY2016, with no corresponding increase in service hours or miles. At the same time, operating costs increased substantially. This was attributed to the mid-life overhaul of the light rail fleet, which VTA completed with in-house labor after determining it was the most cost-effective way to complete the project.
 - There were paratransit service reporting anomalies for vehicle service hours (VSH) and vehicle service miles (VSM) in each year of the current audit period. This was attributed to a combination of decreasing ridership, the prior paratransit contractor self-reporting paratransit data and not tracking ridership, service hours and miles

consistent with the current reporting methodology, and the transition to a new paratransit contractor.

- While VTA was able to provide the majority of the data requested for this audit, the accuracy of some of the data reported may be questionable or is missing. This resulted from VTA’s terminating its contract with the prior paratransit service provider, Outreach & Escort, Inc. (O&E), in November 2016. VTA then entered into an emergency procurement with MV Public Transportation, Inc. (MVT) for temporary provision of paratransit services. MVT later was awarded the current paratransit contract. The transition from O&E to MVT disrupted the data collection process for paratransit service, and VTA implemented a new data reporting methodology with the transition to the new contractor. Data tracking and reporting has improved and become more consistent with the transition to the new paratransit contractor.

- TDA Performance Trends

VTA’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 current audit period.

Bus Service – 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 0.5 percent, decreasing 2.4 percent in inflation adjusted dollars. Cost per hour decreased in two of the six years examined.
- The cost per passenger increased on average by 5.9 percent per year, which amounted to an average annual increase of 2.9 percent in constant FY2013 dollars.
- Passenger productivity decreased due to overall lower ridership, with passengers per vehicle service hour decreasing 5.1 percent and passengers per vehicle service mile decreasing 4.5 percent per year overall.

- Employee productivity was down slightly, decreasing an average one percent per year.

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

- Labor and benefit costs represented the largest portion of the total costs, representing about 80 percent in all six years. Labor costs increased an average of approximately five percent annually, while fringe benefit costs remained almost unchanged.
- There were modest changes in most component cost categories, with average annual increases of five percent or less in five of the seven cost categories examined.
- Services, fuel, and materials/supplies contributed about 15 percent of total costs, while the remaining categories contributed two percent or less to total costs over the six year period.

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

- Cost efficiency declined, with an average annual increase in the operating cost per hour of 10.9 percent (7.8 percent in inflation adjusted dollars). Annual operating costs rose by an average of 13.3 percent annually, with a much smaller average annual increase in service delivery.
- The operating cost per passenger averaged an annual increase of 18.7 percent, which amounted to a 15.4 percent increase when normalized in FY2013 dollars.
- Passenger productivity worsened, with passengers per hour decreasing 6.6 percent per year on average and passengers per mile decreasing 5.2 percent annually on average over the six-year period.
- Employee productivity increased overall during the period, mainly due to steady increases in FTEs during the current audit period.

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

- There were consistent, significant increases in total costs over the audit period, with an average annual increase of 13.3 percent.
- Costs increased in every cost category, with average double digit cost increases in five of the seven cost categories each year. Cost increases were highest during the current audit period (FY2016 through FY2018).
- The increase in costs is attributed to the mid-life maintenance overhaul of the light rail fleet, a project which VTA chose to complete in-house, rather than outsource, due to projected cost savings.
- The labor and fringe benefits costs contributed between 65 and 70 percent of total hourly costs.
- The share of total operating cost for services and materials/supplies increased their share of total costs during the period to about 14 percent and 16 percent, respectively. The remaining cost component categories contributed less than 10 percent in total.

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

- Cost efficiency declined overall, with an average annual increase in the operating cost per hour of 4.7 percent (1.8 percent in inflation adjusted dollars). Steady annual increases in operating costs and lower service levels influenced this indicator.
- The operating cost per passenger averaged an annual decrease of 1.3 percent, or 4.1 percent in normalized FY2013 dollars. Passenger levels increased by almost 5 percent per year over the period, while operating costs increased only 3.1 percent per year.

- Passenger productivity improved, with passengers per hour increasing about six percent and passengers per mile increasing over seven percent per year on average.

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

- Purchased transportation costs, the largest component cost category at almost 90 percent of total costs, increased by 2.6 percent per year on average, similar to the overall 3.1 percent annual increase in operating costs.
- Costs in all other categories also increased between two and 22 percent per year, but those cost categories comprise only 10 to 12 percent of the total hourly costs.

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

- Cost efficiency improved overall, with an average annual decrease in the operating cost per hour of three percent (5.7 percent in inflation adjusted dollars).
- The operating cost per passenger averaged an annual increase of 6.1 percent, or 3.1 percent when normalized in FY2013 dollars. On average, operating costs decreased by 0.6 percent per year over the period, while ridership decreased by 6.2 percent per year.
- Passenger productivity was down, with passengers per hour decreasing an average 8.5 percent annually and passengers per mile decreasing 4.8 percent per year on average.
- As noted previously in this report, there were some reporting anomalies concerning paratransit vehicle service hours and miles during the current audit period. Those anomalies were attributed to a combination of decreasing ridership, inconsistencies in data collection and reporting by the prior paratransit contractor, and incomplete data resulting from the emergency changeover from the prior contractor to the current paratransit contractor in FY2017.

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

- Purchased transportation costs, by far the largest component cost category, remained relatively unchanged overall, increasing by 0.4 percent per year on average.
 - Significant cost reductions occurred in other categories as well, with labor costs decreasing about 17 percent and services decreasing almost 60 percent per year on average.
 - Other categories such as materials/supplies, casualty/liability and miscellaneous cost categories dropped to zero by FY2018, due to VTA establishing a new Indirect Cost Allocation Plan (ICAP), during the prior TDA audit period, that reallocated paratransit costs to other modes.
- PUC Compliance – VTA is in compliance with the sections of the state PUC that were reviewed as part of this performance audit. These sections included CHP terminal safety inspections, requirements concerning labor contracts, part-time staffing, reduced fares, welfare to work coordination, revenue sharing, and evaluating passenger needs.
 - Status of Prior Audit Recommendations – There were three recommendations made in VTA’s prior performance audit. VTA has implemented corrective actions for all three recommendations from the prior audit.
 - In response to the first recommendation for VTA to improve on-time performance, VTA implemented improvements to driver training and instruction programs for bus operators. For light rail, VTA completed several construction projects that hindered schedule adherence, and focused on signal priority for light rail. The results of VTA’s efforts included a 0.7 percent overall improvement in bus on-time performance and a 9.3 percent improvement for light rail during the current audit period.

- The second recommendation was to address the negative performance trends in service reliability for both bus and light rail service. VTA is adhering to a consistent preventive maintenance schedule for bus operations, and has been placing more new buses into service, and retiring older buses. VTA added light rail maintenance employees to assist in completing required maintenance on its vehicles, and has completed a required mid-life overhaul maintenance for the majority of its light rail fleet. The result of VTA’s efforts has been an almost 20 percent improvement in mean distance between major failures, and a 16 percent improvement in mean distance between all mechanical failures for bus service, and the mean distance between mechanical failures for light rail improved by 1.2 percent overall during the current audit period.
- In response to the third recommendation to address the increase in lost days due to industrial accidents for the light rail service, VTA expanded its employee Health and Wellness Program, expanded the employee safety program to conduct regular safety inspections and monthly safety meetings, and added safety to the supervisor training program. VTA also is tracking long-term disability claims and is providing additional resources to re-integrate employees back into the work force. VTA’s efforts have resulted in a 66 percent reduction in lost days due to industrial injuries and accidents for light rail during the current audit period.

- Functional Performance Indicator Trends

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

Systemwide – The following is a brief summary of the systemwide functional trend highlights between FY2013 and FY2015:

- Administrative costs ranged between about 12 and 14 percent of total operating costs, averaging between \$23 and \$29 per vehicle service hour.

- Marketing costs averaged between three and four percent of total administrative costs, while the marketing cost per passenger trip ranged from three to six cents each year.
- Systemwide farebox recovery ratio decreased from 11 to nine percent during the audit period.

Bus Service – The following is a brief summary of the bus service functional trend highlights between FY2013 and FY2015:

- Service Planning results were mixed overall, as total operating cost per passenger mile increased by 48 percent, reflecting increased costs and lower passenger miles. Vehicle miles and hours in service remained steady at about 84 and 92 percent, respectively, but bus fare recovery ratio decreased 12 percent.
- In Operations, vehicle operations cost increased slightly as a percentage of total operating cost, while vehicle operations cost per service hour increased about 7.5 percent from \$97.41 to \$104.79. Operator scheduled absences remained steady, while unscheduled absences increased about five percent. Schedule adherence remained steady at about 86 percent, while there was an almost 11 percent decrease in passenger complaints per 100,000 boardings. There were very small numbers of passenger commendations and missed trips in all three years.
- Maintenance results found total maintenance costs holding steady at around 27 percent of total operating cost. Vehicle maintenance costs per mile increased just over five percent, while the ratio of mechanic pay hours to vehicle service hours decreased five percent. Scheduled employee absences increased four percent during the audit period, while unscheduled absences increased about 18 percent. Spare ratio decreased from 22 to just under 19 percent. Service reliability improved with mean distance between failures increasing more than 15 percent for both major and total failures during the audit period.
- Safety results demonstrated miles between preventable accidents decreasing slightly overall. A significant increase occurred in casualty and liability costs per service mile and hour during the

period, and lost days due to industrial accidents increased almost 30 percent.

Light Rail – The following is a brief summary of the light rail functional trend highlights between FY2013 and FY2015:

- Service Planning results revealed both vehicle miles and hours in service of about 92 percent of total hours. There was a 62 percent increase in the cost per passenger mile, reflecting a trend of increasing costs and decreasing ridership. Farebox recovery ratio decreased from ten percent to six percent.
- Operations results included a decrease in vehicle operations cost as a percentage of total operating cost, but a 19 percent increase in vehicle operations costs per service hour. Operator scheduled absences were almost unchanged, but unscheduled absences increased just over seven percent overall. Schedule adherence improved 9.3 percent over the audit period from 77.5 to 84.7 percent. Passenger complaints decreased 17 percent during the period from 16.8 to 14 per 100,000 boardings. There were very few passenger commendations and missed trips during the audit period.
- In Maintenance, total maintenance costs rose five percent as a percentage of total operating cost. Vehicle maintenance costs per service mile increased 56 percent, reflecting increased costs and reduced service levels. The ratio of mechanic pay hours to car service hours increased two percent. Employee scheduled absences were almost unchanged while unscheduled absences decreased almost nine percent over the audit period. The vehicle spare ratio decreased about five percent and the mechanical failure rate improved by 1.2 percent overall.
- For Safety, preventable accidents per 100,000 remained unchanged during the audit period. Casualty and liability costs per service hour and service mile increased significantly, by about 186 percent and 203 percent overall, respectively. Lost days due to industrial accidents decreased by 66 percent during the audit period, the result of VTA implementing a recommendation from the prior audit.

Rail Shuttle – The following is a brief summary of the rail shuttle functional trend highlights between FY2016 and FY2018:

- Service Planning results showed minor reductions in performance in vehicle miles and hours in service. Total operating cost per passenger mile decreased about five percent overall.
- Operations exhibited about a ten percent increase in vehicle operations costs as a percentage of total operating cost. Vehicle operations cost per service hour increased about five percent. There were very few complaints and commendations per 10,000 passengers throughout the audit period. Data for on-time performance and missed trips was unavailable. The shuttle contractor is responsible for shuttle operations and does not track that data, as it is heavily influenced by the ACE commuter rail service schedules and performance.
- Maintenance results revealed vehicle maintenance costs decreased as a percentage of total costs, as did maintenance cost per vehicle service mile. The spare ratio was mostly stable, remaining at less than nine percent throughout the period. There was significant improvement in mechanical failure rates.
- VTA did not report any preventable accidents during the current audit period.

Paratransit – The following is a brief summary of the paratransit functional trend highlights between FY2013 and FY2015:

- Service Planning results were mixed, with total operating cost per passenger mile decreasing slightly during the audit period, performance in vehicle miles and hours in service declining by about three and ten percent, respectively, and farebox recovery ratio decreasing from 12 percent to 9.6 percent as well.
- Operations results included about a 28 percent decrease in vehicle operations cost as a percentage of total costs, and the cost per service hour decreasing by almost 31 percent. Schedule adherence dipped slightly from about 91 percent to 88 percent, but complaints per 10,000 passengers more than tripled from 6.8 to 24.7 per year. There

were no ADA trip denials reported and less than one percent of missed trips per total trips were reported during the audit period. Late trip cancellations and passenger no-shows as a percentage of total ADA trips both significantly over the audit period, from less than one percent in FY2016 to 1.7 and three percent respectively. VTA did not report data for total trip cancellations per total number of ADA trips provided during the audit period.

- Maintenance results showed vehicle maintenance costs increasing over the audit period, with maintenance costs rising from four percent to 10.2 percent of total operating costs, and vehicle maintenance cost per service mile doubling from \$0.17 to \$0.34. The spare ratio increased significantly from 1.3 to 33.5 percent, and there was significant improvement in mechanical failure rates. The increase in maintenance costs and vehicle spare ratio were likely influenced by the emergency change in paratransit contractors in FY2017.
- VTA does not track preventable accident data, as the paratransit contractor is liable for all accidents that occur in the paratransit service.

Recommendations

1. ADDRESS THE SIGNIFICANT INCREASE IN CASUALTY/LIABILITY COSTS FOR THE FIXED-ROUTE BUS AND LIGHT RAIL SERVICE.

[Reference Sections: III. TDA Performance Indicators and Trends; VI. Functional Performance Indicator Trends]

The review of fixed-route bus and light rail component costs found significant increases in casualty/liability expenses for both divisions. Casualty/liability costs for bus increased an annual average of 20.5 percent, while light rail casualty/liability costs increased an average of 36.8 percent annually during the six-year period. The cost increases caused significant increases in the cost per service hour and service mile for both bus and light rail service.

VTA should investigate the reasons for the increase in casualty/liability costs for the bus and light rail divisions and develop strategies to reduce the causes for the increased costs.

2. EXAMINE THE INCREASE IN LOST DAYS DUE TO INDUSTRIAL ACCIDENTS FOR THE FIXED-ROUTE BUS SERVICE.

[Reference Section: VI. Functional Performance Indicator Trends]

The number of days reported lost due to industrial accidents for the fixed-route service has increased from 3,695 days in FY 2016 to 4,793 days in FY2018, an increase of almost 30 percent over the audit period.

VTA should investigate the reasons for the increase in lost days due to industrial accidents and develop a plan to reduce that number in the bus division, similar to the light rail division's efforts during the current audit period.

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

Functional Performance Inputs - Systemwide (All Modes)

Data Item	FY2016	FY2017	FY2018	Source
Total Operating Costs	\$359,998,459	\$381,758,989	\$410,229,473	NTD F-40
Administrative Costs	\$43,104,190	\$52,429,252	\$55,663,146	NTD F-40
Vehicle Service Hours	1,909,966	1,910,753	1,924,590	NTD S-10 (all modes)
Marketing Costs	\$1,205,800	\$1,899,858	\$2,203,712	VTA's SAP Controlling Reports - cost center 15050--Marketing
Unlinked Passenger Trips	43,996,916	39,137,607	37,510,168	NTD S-10 (all modes)
Farebox Revenue (All Modes)	\$40,429,880	\$35,524,503	\$36,554,309	NTD F-10

Functional Performance Inputs – Bus Service

Data Item	FY2016	FY2017	FY2018	Source
Vehicle Service Miles	15,518,418	15,712,632	15,889,222	NTD S-10 MB
Total Vehicle Miles	18,556,393	18,810,946	18,997,876	NTD S-10 MB
Vehicle Service Hours	1,336,767	1,352,310	1,361,557	NTD S-10 MB
Total Vehicle Hours	1,455,561	1,474,841	1,482,444	NTD S-10 MB
Unlinked Passenger Trips	32,195,504	29,057,047	28,048,405	NTD S-10 MB
Farebox Revenue	\$28,254,567	\$26,665,427	\$26,479,369	NTD F-10
Total Operating Costs	\$242,711,833	\$248,477,183	\$258,487,093	NTD F-30 MB
Passenger Miles	190,320,900	150,613,834	136,901,868	NTD S-10 MB
Vehicle Operations Costs	\$146,072,271	\$148,404,965	\$159,054,870	NTD F-30 MB
Total Operator Time (Days or Hours)	2,527,189	2,545,505	2,571,624	Emp. Utilz Report
Operator Scheduled Absences (Days or Hours)	177,364	178,174	176,141	Emp. Utilz Report
Operator Unscheduled Absences (Days or Hours)	194,901	193,357	208,127	Emp. Utilz Report
Trips On-Time	85.8%	86.3%	86.4%	FY2018 Annual Transit Ops. Performance Report
Total Trips	1,149,017	1,455,576	1,168,465	Route Summaries (FX)
Complaints	7,217	6,946	5,608	Salesforce
Commendations	1	65	59	Salesforce
Missed Trips	4,711	5,531	3,973	Estimated based on percent service lost
Maintenance Pay Hours	519,622	524,051	499,178	Emp. Utilz Report
Total Maintenance Employee Time (Days or Hours)	653,090	659,060	656,145	Emp. Utilz Report
Maint. Employee Sched. Absences (Days or Hours)	47,777	46,400	49,959	Emp. Utilz Report
Maint. Employee Unsched. Absences (Days or Hours)	40,438	46,284	47,870	Emp. Utilz Report
Vehicle Maintenance Costs	\$57,960,331	\$59,961,810	\$62,679,089	NTD F-30 MB
Non-Vehicle Maintenance Costs	\$8,807,077	\$8,348,595	\$5,922,674	NTD F-30 MB
Spare Vehicles (Total less Maximum Service)	107	71	88	NTD S-10 MB
Total Vehicles	499	460	472	NTD S-10 MB
Revenue Vehicle Mechanical System Failures - Total	2,197	2,155	1,940	NTD R-20
Revenue Vehicle Mechanical System Failures - Major	1,897	1,785	1,620	NTD R-20
Preventable Accidents	6	2	4	NTD S&S 40- MB
Casualty/Liability Costs	\$2,046,488	\$2,598,999	\$3,878,156	NTD F-30 MB
Lost Days - Industrial Accidents	3,695	4,689	4,793	Party Claims Administrator's (TriStar's) Risk Management Information System

Functional Performance Inputs – Light Rail

Data Item	FY2016	FY2017	FY2018	Source
Car Service Miles	3,470,427	3,349,372	3,314,903	NTD S-10 LR
Total Car Miles	3,749,154	3,623,530	3,592,975	NTD S-10 LR
Car Service Hours	218,459	217,434	220,589	NTD S-10 LR
Total Car Hours	237,563	235,695	238,705	NTD S-10 LR
Unlinked Passenger Trips	10,721,047	9,132,084	8,507,096	NTD S-10 LR
Farebox Revenue	\$9,408,722	\$8,062,916	\$8,031,206	NTD F-10 LR
Total Operating Costs	\$92,428,467	\$106,017,010	\$128,622,203	NTD F-30 LR
Passenger Miles	54,654,921	47,937,329	46,981,059	NTD S-10 LR
Vehicle Operations Costs	\$35,095,067	\$37,272,722	\$41,461,397	NTD F-30 LR
Total Operator Time (Days or Hours)	295,131	276,079	313,215	Emp. Utilization Report
Operator Scheduled Absences (Days or Hours)	20,804	19,683	22,299	Emp. Utilization Report
Operator Unscheduled Absences (Days or Hours)	23,568	23,114	26,826	Emp. Utilization Report
Trips On-Time	77.5%	84.3%	84.7%	FY2018 Annual Transit Ops. Performance Report
Total Trips	139,055	138,562	141,777	Route Summaries (FX)
Complaints	1,806	1,345	1,189	Salesforce
Commendations	34	33	30	Salesforce
Missed Trips	42	55	454	Estimated based on percent service lost
Maintenance Pay Hours	243,209	249,164	250,511	Emp. Utilization Report
Total Maintenance Employee Time (Days or Hours)	341,257	349,502	337,311	Emp. Utilization Report
Maint. Employee Sched. Absences (Days or Hours)	21,589	20,889	21,253	Emp. Utilization Report
Maint. Employee Unsched. Absences (Days or Hours)	16,890	19,069	15,224	Emp. Utilization Report
Vehicle Maintenance Costs	\$27,569,981	\$33,919,976	\$41,087,099	NTD F-30 LR
Non-Vehicle Maintenance Costs	\$19,198,525	\$22,295,061	\$27,318,635	NTD F-30 LR
Spare Cars (Total less Maximum Service)	40	40	38	NTD S-10 LR
Total Cars	99	99	99	NTD S-10 LR
Revenue Vehicle Mechanical System Failures - Total	95	84	90	NTD R-20 LR
Revenue Vehicle Mechanical System Failures - Major	95	84	90	NTD R-20 LR
Preventable Accidents	1	1	1	NTD S&S 40 - LR
Casualty/Liability Costs	\$774,174	\$1,088,222	\$2,238,102	NTD F-30 LR
Lost Days - Industrial Accidents	1,702	1,542	578	Party Claims Administrator's (TriStar's) Risk Management Information System

Functional Performance Inputs – Rail Shuttle

Data Item	FY2016	FY2017	FY2018	Source
Vehicle Service Miles	193,614	189,481	188,493	NTD S-10 MB PT
Total Vehicle Miles	234,975	230,183	230,465	NTD S-10 MB PT
Vehicle Service Hours	17,606	17,584	17,556	NTD S-10 MB PT
Total Vehicle Hours	19,290	19,251	19,259	NTD S-10 MB PT
Unlinked Passenger Trips	428,666	407,032	424,941	NTD S-10 MB PT
Farebox Revenue	\$0	\$0	\$0	NTD F-10
Total Operating Costs	\$1,863,467	\$1,734,698	\$1,771,267	NTD B-30 (2016) & F-30 MB PT (FY17-18)
Passenger Miles	1,565,693	1,498,870	1,564,903	NTD S-10 MB PT
Vehicle Operations Costs	\$922,322	\$825,844	\$962,949	FY16 - MTC TDA App. Form F(a) MBPT; NTD F-30 MB PT
Complaints	11	11	6	Salesforce
Commendations	1	0	0	Salesforce
Vehicle Maintenance Costs	\$413,012	\$386,249	\$379,471	FY16 - MTC TDA App. Form F(a) MBPT; NTD F-30 MB PT
Non-Vehicle Maintenance Costs	\$140,150	\$204,744	\$63,824	FY16 - MTC TDA App. Form F(a) MBPT; NTD F-30 MB PT
Spare Vehicles (Total less Maximum Service)	1	1	1	NTD S-10 MB PT
Total Vehicles	12	12	13	NTD S-10 MB PT
Revenue Vehicle Mechanical System Failures - Total	4	2	1	NTD R-20
Revenue Vehicle Mechanical System Failures - Major	2	0	0	NTD R-20
Preventable Accidents	N/A	N/A	N/A	None reported during this audit period

Functional Performance Inputs – Paratransit

Data Item	FY2016	FY2017	FY2018	Source
Vehicle Service Miles	4,929,806	5,126,725	5,544,166	NTD S-10 DR
Total Vehicle Miles	5,522,211	5,062,126	6,382,567	NTD S-10 DR
Vehicle Service Hours	337,134	323,425	324,888	NTD S-10 DR
Total Vehicle Hours	372,801	332,967	399,666	NTD S-10 DR
Unlinked Passenger Trips	651,679	541,444	530,726	NTD S-10 DR
Farebox Revenue	\$2,766,591	\$1,806,160	\$2,043,734	NTD F-10
Total Operating Costs	\$22,992,692	\$25,530,098	\$21,348,910	NTD B-30 (2016) & F-30 DR/DT (FY17-18)
Passenger Miles	6,595,669	5,593,810	6,338,009	NTD S-10 DR
Vehicle Operations Costs	\$20,203,202	\$16,198,981	\$13,466,771	NTD B-30 (2016) & F-30 DR/DT (FY17-18)
Trips On-Time	90.9%	91.9%	87.7%	FY2018 Annual Transit Ops. Performance Report
Total Trips	651,679	570,662	530,726	Monthly Accessible Services Perf. Report (2016); FY18 Monthly Billing Summary (MV); FY17 TOPR; FY18 TOPR
Complaints	440	996	1,312	Monthly Accessible Services Perf. Report (2016); FY 17 is comprised of Outreach data Jul - Oct 2016 and FY 17 VTA Salesforce data; FY 18 VTA Salesforce data
Missed Trips	0	305	744	Monthly Accessible Services Perf. Report (2016); FY18 Monthly Billing Summary (MV); FY17 is an extrapolation comprised of Outreach for Jul - Oct 2016 and MV for Dec 2016 - Jun 2017 (Productivity Report)
Total ADA Trips	539,514	510,018	472,830	Perf. Report (2016); FY 17-18 Annual TOPR
ADA Trip Denials	0	0	0	Monthly Accessible Services Perf. Report (2016);
Trip Cancellations	N/A	N/A	N/A	Agency did not report on this data during reporting period.
Late Trip Cancellations	1,258	3,510	8,247	Monthly Accessible Services Perf. Report (2016); FY18 Monthly Billing Summary (MV)
No Shows	2,914	10,273	14,418	Monthly Accessible Services Perf. Report (2016); FY18 Monthly Billing Summary (MV); FY17 is an extrapolation comprised of Outreach for Jul - Oct 2016 and MV for Dec 2016 - Jun 2017 (Productivity Report).
Vehicle Maintenance Costs	\$827,921	\$1,339,790	\$1,883,260	NTD B-30 (2016) & F-30 DR/DT (FY17-18)
Non-Vehicle Maintenance Costs	\$98,615	\$171,000	\$286,287	NTD B-30 (2016) & F-30 DR/DT (FY17-18)
Spare Vehicles	3	86	93	NTD S-10 DR
Total Vehicles	227	281	278	NTD S-10 DR
Revenue Vehicle Mechanical System Failures - Total	24	26	20	NTD R-20
Revenue Vehicle Mechanical System Failures - Major	2	2	1	NTD R-20
Preventable Accidents	N/A	N/A	N/A	Agency did not report on this data during reporting period.