

Metropolitan Transit Authority of Harris County

Fiscal Years 2012-2015
Performance Audit

Task 3: Transit Operations

January 2017



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Section 1. Introduction

1.1 Transit Performance Audit Background

Section 451.454 of the Texas Transportation Code mandates quadrennial performance audits of Texas transit agencies for municipalities with a population of more than 1.9 million. The purpose of the performance audit is to provide evaluative information necessary for state and local officials to perform oversight functions and to provide useful information to the transit agency for improving efficiency and effectiveness of its operations.

The Metropolitan Transit Authority of Harris County (METRO) meets this requirement and therefore retained Milligan & Company, LLC to perform the audit. Milligan & Company, LLC, in association with Contract Service Innovations, LLC, worked closely with METRO's staff to conduct the Fiscal Years (FY) 2012 to 2015 performance audit. This audit included FY 2012 data, which was previously reviewed as part of the FY 2009 – FY 2012 quadrennial audit. Some of the performance statistics reported in FY 2012 have been adjusted for this report.

The performance audit assessed METRO's:

- Compliance with applicable state law from Chapter 451 of the Texas Transportation Code (Task 1).
- Collection and compilation of base statistics and measurement of specified state-mandated performance indicators (Task 2).
- Performance in one of three areas (i.e. administration and management, transit operations, or system maintenance). Each functional area must be addressed once every three audit cycles (Task 3). The focus of the functional review for this audit is on transit operations.

This report presents the results of the transit operations review between October 1, 2011 and September 30, 2015 for FY 2012, FY 2013, FY 2014, and FY 2015. It is an assessment of transit operations, focusing on METRO's transportation functions and activities that are responsible for service delivery.

The detailed review of METRO's bus and rail transportation functions complies with state performance auditing requirements, which stipulate that each of the three functional areas must be reviewed once in every three audit cycles. The previous performance audit provided a review of two of METRO's administrative functions: finance and human resources.

While the scope of the audit is consistent with state requirements, METRO's management recognizes that an accurate understanding of transit performance trends cannot be obtained by reviewing transportation functions in isolation, and that the performance of the maintenance function must be considered along with transportation to obtain a complete and balanced view of METRO's transit services.

The results of the required performance indicator assessment and legislative compliance review have been provided in separate reports:

- Legislative Compliance review (final report dated January 2017)
- Performance Indicators results (final report dated January 2017)

To provide context for the transit operations review, a section of this report discusses the results of the trend analysis of system-wide performance indicators.

1.2 Transit Performance Audit Overview

The performance audit is intended to provide a balanced and objective assessment of METRO's performance. This functional review provides a discussion of performance trends, accomplishments and challenges over the audit period, reviews and evaluates aspects of the activities that are key to the delivery of METRO's services, and suggests opportunities for METRO to improve its operating efficiency, effectiveness and/or productivity.

To provide a balanced perspective on METRO's overall performance, significant accomplishments and positive performance trends are discussed as well as opportunities for improvement. The audit is a look back over the past four years, from October 2011 through September 2015. Since current trends, objectives, and programs are more relevant as METRO moves forward, an effort has also been made to recognize and include the plans and activities that are currently underway at METRO and to articulate their implications for METRO's future.

1.2.1 METRO's Audit Period Accomplishments will Enhance Service

- Bus and rail announcements in English and Spanish
- Texas Medical Center Transit Center is well designed and functional with excellent connectivity from bus to rail
- Major bus realignment to improve service
- Houston Livestock and Rodeo successfully carried over 26,000 people daily
- Mobile ticketing
- Rail Purple and Green Lines successfully opened
- Red Line successful extension to the Northline Transit Center/Houston Community College
- Free transfers in any direction allowed within a three-hour window

1.2.2 Challenges were Evident in Performance Trends

Using state-mandated key performance indicators, METRO's performance generally demonstrates declining performance trends over the FY 2012 – FY 2015 audit period.

- Sales and use tax receipts which measure revenues received increased by 22.1 percent
- The four cost effectiveness/efficiency measures reflect increased costs.
 - Operating cost per passenger increased 10.7 percent
 - Operating cost per revenue hour increased 11.7 percent
 - Operating cost per revenue mile increased 11.4 percent
 - Fare recovery ratio fell 14.4 percent
- Service quality is good, however, two of the four service productivity/quality measures showed decline.
 - Average vehicle occupancy increased 1.4 percent
 - On-time performance decreased an average 7.8 percent
 - Accidents per 100,000 total miles decreased an average 5.1 percent
 - Miles between mechanical road calls decreased an average 23.0 percent (Bus: +9.4 percent, Rail: -32.4 percent)

As discussed in the *Performance Indicators* report, the results reported here are not comparable to the information provided in monthly reports to METRO's Board during the audit period. There is no requirement for METRO to use the state definitions for its internal reports; it is more important for METRO to provide information that is meaningful to its stakeholders.

1.2.3 METRO's Management Recognizes the Need to Increase Ridership

Over the audit period, METRO implemented several enhancements to its transit system, including expanded rail service, extended bus service, and an extensive marketing program. These enhancements were implemented to address the relocation of major trip generators in the service area and to meet the needs of METRO's patrons as the population center of the region has shifted to the southwest.

METRO expanded its Red Line and opened the new Green and Purple Lines increasing its total rail miles to approximately 22. METRO also realigned its bus network by eliminating unnecessary bus routes in favor of extended service to areas with population growth and on the weekend. With these changes, METRO projected increased ridership. Through its outreach efforts, such as special school programs and special fare free days, METRO strived to meet its ridership projections. However, there is a challenge of low ridership in downtown Houston. This challenge is amplified by businesses, such as Shell Oil Company, moving its offices west of downtown in 2017, although it will still be within the METRO service area. To offset this loss, METRO should create new marketing incentives and use employees that live downtown to inspire their fellow residents to ride METRO. Benefits of this initiative include providing METRO with one-on-one interaction with commuters, in addition to unfettered feedback to enhance the public transit experience.

METRO should continue to evaluate service changes until ridership goals are achieved and the service meets the needs of the public.

1.2.4 METRO's Management is Taking Steps to Increase Service and Control Costs

Over the audit period METRO's system-wide operating costs increased 17.8 percent. The largest increase was for METRORail service at approximately 192.6 percent. The large, but expected increase in rail operating cost, can be directly attributed to increased rail service with the expansion of the Red Line and the addition of the Purple and Green Lines.

Bus operating costs grew relatively more slowly at 10.6 percent as an indication of the success gleaned from the redesigned system.

METROLift operating costs grew 43.9 percent due to the service population increase. As a result, operating cost per passenger increased by a margin of 26.5 percent. Consequently, METRO increased METROLift fares in FY 2016 from a base fare of \$1.15 to \$1.25 to address the increase in operating costs.

In addition to the increase in the METROLift fare, METRO would be served well to redesign its fare structure to increase fare recovery ratios and average fares. METRO's \$1.25 base fare is comparatively low for a transit agency of METRO's caliber, although in line with other agencies authorized under Texas Transportation Code 451. Consequently, METRO's fare recovery ratio declined to 13.7 at the end of the audit period. While in line with other transit agencies created under Texas Transportation Code 451, in other parts of the country, rates of 25 or more are common among similarly situated transit systems.

1.3 METRO's Transportation Functions

METRO operates fixed-route bus, light rail (METRORail), and paratransit (METROLift) services over a 1,303-square mile service area that includes the City of Houston, 14 other municipalities, portions of unincorporated Harris County, and small portions of surrounding counties. METRO's bus routes are operated using a 100-percent accessible fleet of over 1,427 buses. METRO bus services currently provide about 84 million boardings per year.

METRO inaugurated its light rail service in January 2004. It is a double tracked system that operates primarily at street grade in a semi-exclusive right of way serving 24 stations for approximately 22 miles.

METROLift provides service to persons with disabilities who are unable to board and/or navigate METRO's accessible fixed-route bus and rail services. METROLift customers are pre-qualified for service based on parameters established by the Americans with Disabilities Act (ADA) of 1990. Services are scheduled in response to specific customer requests. METROLift services use 156 METRO-owned vans operated by First Transit. Minivan service is provided by the third-party contractor Greater Houston Transportation Company (Yellow Cab), which operates 272 dedicated wheelchair accessible minivans leased by drivers from Yellow Cab. The most significant addition to this service is the Taxicab backup service that allows for same day transportation.

For this review, interviews were conducted with the staff who are knowledgeable of METRO's fixed-route bus, rail, and paratransit transportation functions. Key staff include:

Chief Executive Officer	Director of Health, Pension, and Wellness
Deputy Chief Executive Officer	Director of Safety
Superintendent of Rail Transportation	Director of Right of Way
Executive Vice President, Operations, Public Safety, and Customer Service	Executive Vice President, Planning, Engineering, and Construction
Director of Service Planning, Scheduling, and Evaluation	Lead Management Analyst of Revenue/Fare Policy
Chief Financial Officer	Director of Labor Relations
General Manager of First Transit - Northwest	Director of Staffing and Diversity
Chief Operating Officer	METROLift Services Operations Supervisor
Vice President of Human Resources	Chief of Signals and Communication
Director of Grant Programs	Executive Vice President of Administration
Senior Director of Contracted Paratransit, and Vanpool	Senior Director of Bus Maintenance
Director of Drug and Alcohol Programs	Senior Director of Transportation
Director of Paratransit (METROLift) Services	Chief Safety Officer
Superintendent of Transportation - Kashmere	Superintendent Bus Maintenance - Kashmere

The performance audit also included extensive reviews of documents and data pertaining to transit operations, such as:

- Safety Program Plan for Metropolitan Transit Authority of Harris County (Bus & Rail)
- Capital and Operating Budgets, FY 2012 – FY 2015
- Monthly Board Business Reports, FY 2012 – FY 2015
- Operations and Transportation Goals and Objectives, FY 2012 – FY 2015
- METROLift Goals and Objectives, FY 2012 – FY 2015
- METROLift Service Contracts
- Operator Time Keeping System, History Operator Utilization Reports, FY 2012 – FY 2015
- Monthly Summary of Complaints/Commendations/Comments, FY 2012 – FY 2015
- Databases related to accidents, disciplinary actions, scheduling information, complaints, grievances, manpower, and incentive payments for the review period
- METRO's labor agreement with the Transport Workers Union
- Performance Management, Appraisal and Compensation Policies and Procedures – System

Additional key documents reviewed included:

- METRORail Performance Statistics
- Rail Operations Organization Charts
- FY 2012 – FY 2015 Rail Objectives and Accomplishments
- FY 2012 – FY 2015 Rail On-Time Performance
- Rail Operations Complaint Statistics
- Accident Reporting Forms
- Construction Safety Program Guide
- METRORail Standard Operating Procedures

The consultant visited two of METRO's bus operating facilities (Kashmere and Northwest), the Rail Operations Center, Transit Police Operations, Houston TranStar Transportation and Emergency Management Center, and METROLift operations at the Frist Transit Operating Facility. The consultant also rode the bus and light rail systems.

1.4 Organization of the Report

The remaining sections of this report provide the results of the transit operations review:

- **Section 2: Transit Performance Overview** – provides context for the transit operations review. This section provides a background for transit in the service area and is a discussion of METRO's performance results and trends for key performance indicators during the audit period.
- **Section 3: Bus Operations** – discusses METRO's systems and procedures for delivering bus services, including the organizational structure and results of METRO's operations planning such as scheduling, manpower planning, dispatching, and operator performance, as well as customer feedback on service delivery and service quality.
- **Section 4: Rail Operations** – describes METRO's organizational structure and aspects of rail operations planning, including performance.
- **Section 5: Paratransit Operations** – discusses METRO's service for the disabled. METROLift is a complementary paratransit service designed to meet the requirements of ADA. METROLift provides curb-to-curb, or door-to-door service upon request for people with disabilities who cannot use the fixed-route system.
- **Section 6: Recommendations** – discusses and recommends opportunities for improving the efficiency, effectiveness and productivity of METRO's service delivery functions.
- **Section 7: Summary** – provides a synopsis of the consultant's observations of METRO's system and the recommendations.
- **Appendix A** – provides the annual data used in calculating the performance indicators as well as the annual performance measures.
- **Appendix B** – provides the performance indicators by mode, including two additional service effectiveness indicators (passengers per revenue hour and passengers per revenue mile) that are frequently reported as a basis for evaluating performance in the transit industry.

Section 2. Transit Performance Overview

2.1 Background

According to a study conducted by Woods and Poole Economics Inc. of the City of Houston, the City is the fastest growing metropolitan area in the United States. The area was the fastest growing metropolitan area numerically during 2013 – 2014, with 156,371 people added during the period. From 2000 to 2030, the Houston metropolitan area is projected to rank fifth in the nation in population growth as evidenced by the following statistics.

- As of 2011, Greater Houston includes four of the ten wealthiest communities in Texas: Hunters Creek Village, Bunker Hill Village, West University Place, and Piney Point Village.
- Among the ten most populous areas in the United States, Houston ranked first in Texas and third in the United States in the “Best Places for Business Careers.”
- The University of Houston school system’s annual impact on the Houston area economy equates to \$1.1 billion in new funds each year, and generates 24,000 local jobs.
- Greater Houston is known for its ethnic diversity and strong international community. It is on the list of 65 most important world cities – it is number 35. It is a magnet for diversity and business.
- Multiple universities are located within the Houston metropolitan area. Among them, the University of Houston is a nationally recognized Tier One research university; it has nearly 40,000 students on a 667-acre campus in southeast Houston. METRO’s service area includes the historically black college, Texas Southern University.

2.2 System-wide and Modal Performance Trends

System-wide and modal performance trends were reviewed to assess the effectiveness and efficiency of METRO’s transit operations. The discussion provided here is a high-level overview that has been used as a starting point for the functional review of transit operations. Operating efficiency, effectiveness, and productivity trends, along with the practices, procedures, and activities behind them, are discussed at a more detailed level in the bus, rail, and paratransit operations sections of this report.

System-wide and modal performance indicators have been validated as a basis for determining performance trends. Using state-mandated key performance indicators, METRO’s performance generally demonstrates some declining performance trends during the FY 2012 – FY 2015 audit period.

The measure of regional subsidization of METRO transit service which equates to sales and use tax receipts per passenger increased by 14.7 percent.

The four cost effectiveness/efficiency measures reflected increased costs over the FY 2012 – FY 2015 audit period.

- Cost effectiveness/efficiency, measured as:
 - Operating cost per passenger: +10.7 percent
 - Operating cost per revenue hour: +11.7 percent
 - Operating cost per revenue mile: +11.4 percent
 - Fare recovery ratio: -14.4 percent

Trends in service quality showed small improvements in customer satisfaction, and room for service improvement.

- Service quality, measured as:
 - Average vehicle occupancy: +1.4 percent
 - On-time performance
 - Bus: -2.7 percent
 - Rail: -12.8 percent
 - Accidents per 100,000 miles
 - Bus: -2.7 percent
 - Rail: -7.4 percent
 - Miles between mechanical road calls
 - Bus: +9.4 percent
 - Rail: -32.4 percent

Each of these indicators is discussed further in this section. Cost-based indicators have been calculated for METRO services system-wide as well as separately for bus, light rail, and paratransit services.

Performance indicators were calculated based on verified data, in compliance with state definitions, and generally demonstrated declining performance during the audit period. The performance statistics used to calculate the performance indicators are provided in the appendices to this report.

2.2.1 Total Operating Costs and Cost Efficiency Indicators

Both total operating costs and operating costs adjusted for the levels of service delivered and consumed increased over the audit period, from FY 2012 to FY 2015.

- Total operating costs include those costs of delivering transit service over which METRO's control is limited (e.g. fuel, insurance, mandated benefits and programs).
- Operating costs adjusted for service include operating cost per revenue hour and per revenue mile. Both of these costs increased 11.7 and 11.4 percent, respectively, with the largest increase between FY 2014 to FY 2015. The increases in these indicators reflect the growth in operating costs, which exceeded the growth in service levels. During the audit period:
 - Bus revenue hours grew 184,249 hours from FY 2012 to FY 2015, while bus revenue miles increased 1,081,075.
 - METRORail service added 67,118 hours and 727,747 revenue miles.
 - METROLift service has grown by 190,552 hours and 1,920,316 revenue miles.

2.2.2 Revenue-Based Performance Indicators Demonstrated Mixed Trends

Among METRO's key performance indicators are two that measure revenue trends: sales and use tax receipts per passenger trip and the fare recovery ratio.

- Sales and use tax receipts per passenger trip, a measure of METRO's regional subsidization, increased 14.7 percent over the audit period, from \$7.27 to \$8.34. The growth in this indicator is attributable to a significant increase in tax receipts.
- METRO's fare structure is complex and deeply discounted. The \$1.25 base fare is low compared to peer transit systems. The fare recovery ratio, which measures the share of operating cost that is recovered from passenger fare payments, decreased 14.4 percent, from 16.0 in FY 2012 to 13.7 in FY 2015. While in line with other transit agencies created under Texas Transportation Code 451, similar systems of METRO's caliber around the country average fare recovery rates of 25 or more. Often, agencies with higher fare recovery ratios are subject to state or local mandates or internal standards that require higher recovery rates. Nevertheless, compared to the industry, METRO's current rate is low.

2.2.3 Service Quality

There are four state-mandated performance indicators that pertain to service quality:

- Average vehicle occupancy
- On-time performance

- Accidents per 100,000 vehicle miles (directly operated services only)
- Miles between mechanical road calls (directly operated services only)

Two of the four measures of service quality improved over the audit period, average vehicle occupancy and accidents per 100,000 vehicle mile.

- Average vehicle occupancy, an indicator of customer satisfaction with service quality, increased slightly by 1.4 percent as passenger miles increased significantly. Passenger miles, which measure the length of passenger trips, also correlate with trends in passenger boardings. These results show the work METRO is doing to attract new riders.
- Accidents per 100,000 total miles is an indicator of system safety. The accident rate fell an average of 5.1 percent between FY 2012 and FY 2015. This trend reflects METRO's focus on improving safety, the effectiveness of the programs that have been implemented since FY 2012, along with METRO's commitment to system maintenance.

The remaining two measures of service quality declined over the audit period.

- On-time performance impacts the riders' willingness to rely on METRO services. Bus on-time performance decreased slightly, from 73.3 percent to 71.3 percent. Rail on-time performance decreased from 97.3 percent in FY 2012 to 84.8 percent in FY 2015. The 12.8 percent decline in rail on-time performance can be directly attributed to a mechanical failure of the axle counter signal interface system. METRO is working to replace the signal interface system which will improve service quality for this mode.
- Mileage intervals between bus mechanical road calls increased from 9,006 miles in FY 2012 to 9,855 miles in FY 2015. This indicator showed great improvement in FY 2014, reaching a high of 10,261 miles. Since that time, performance has fallen 4.0 percent to 9,855. Results like these reiterate the importance METRO places on its maintenance practices, fleet composition, spare ratios, and reporting consistency. Rail mileage between mechanical road calls has decreased from 24,744 in FY 2012 to 16,724 miles in FY 2015. This decrease is due in part to a failure of the axle counter signal interface system mentioned above.

Section 3. Bus Operations

3.1 Bus Service

METRO operates bus service within the City of Houston and fourteen other municipalities and carries over 86 million passengers a year. Service is operated from five bus operating facilities (BOFs) that are owned and operated by METRO (Polk, West, Kashmere, Hiram Clark, Fallbrook) and 29 Park and Ride facilities. There are 75 local and 32 commuter routes serving 20 transit centers. METRO offers a 50 percent discount on bus and rail service to seniors, students, and the disabled.

The most significant change in bus service during the audit period was the implementation of the New Bus Network. The New Bus Network was a significant realignment of the local bus system. After three years of planning, countless meetings, public hearings and help from consultants, METRO launched its New Bus Network in August 2015. The New Bus Network changed every route in its system overnight as discussed below.

In its self-assessment, METRO determined that a major reason for a decline in bus boarding's was that people were moving away from the city. In the 1970s, the city was more centralized with a downtown employment center surrounded by dense residential neighborhoods. Today, residences and jobs were moving away from the central business district. The old network was designed to take people downtown, but today people are traveling from everywhere to everywhere. To begin assessing the direction of change for the bus service, METRO held a six-month conversation with the leaders of all affected communities, elected officials, and businesses to determine what service was needed. The results of these conversations and ultimate changes were a new system designed to take people from their origin to their destination quickly and reliably.

The network is headlined by 22 routes (up from 11 on weekdays and one on Sunday) that run every 15 minutes or better, seven days a week. This service forms a grid across the busiest parts of the city so that most common trips can be made without connections and short wait times. The frequent network is supported by a few dozen routes that operate every 30 minutes or better and are monitored for future upgrades to frequent service when ridership increases. The remaining service is operated hourly to low-ridership areas. The service now matches the destinations of patrons, so there are more options for getting to work, school, and recreational activities. With the New Bus Network, METRO increased service in FY 2016.

3.2 Consultant Assessment

The consultants spent five weeks riding the system in most areas of service. The team rode buses and trains in downtown areas, to park and ride lots, and outside of the city. The sampling of trips included eight routes taken at various times (see Chart below). Buses appeared to be clean, comfortable, timely and efficient. Announcements were in English and Spanish. Drivers answered questions from patrons and were knowledgeable about routes and locations in and around Houston. Bus stops had signage (some were not updated with new signs) and a small percentage was not clean.

Bus service connected well with other routes at transit centers and at train stations, meaning that the wait time for a passenger between transfers was minimal, averaging five minutes from disembarking one route to boarding the other; many of the connecting buses were waiting for passengers at the transfer center. Bus service in total was generally on-time, with all of the morning routes traveling on schedule. On two occasions afternoon buses were late. One particular afternoon trip to the airport from downtown Houston (Route 102) spanned ninety minutes, approximately 30 minutes more than the expected one hour. There was significant traffic congestion due to highway construction. The other afternoon trip to Willowbend (Route 10) was 10 minutes late due to downtown traffic congestion during rush hour.

Chart 1 – Sample Bus Trips

Route No.	Destination
Morning Trips	
10	Willowbend
14	Hiram Clarke
49	Chimney Rock/S. Post Oak
50	Broadway
Afternoon Trips	
10	Willowbend - LATE
14	Hiram Clarke
30	Clinton/Ella
49	Chimney Rock/S. Post Oak
102	Bush IAH Express - LATE
Night Trips	
14	Hiram Clarke
32	Renwick/San Felipe
96	Veterans Memorial

During the five-week period, members of the consultant team met with approximately 50 stakeholders. Many were delighted with the New Bus Network. They communicated that the new system was convenient and comfortable. They expressed satisfaction with the additional service on weekends. Though the overall feedback was positive, there was one encounter on the Route 14 bus, where a patron complained about missing the old Route 98. The reason was that Route 98, which ran every 15 minutes, provided transportation to work, but now it only runs every 60 minutes. As a result, the patron now takes the Route 14 to work, but must walk an extra three blocks. When asked if the ridership on the bus was satisfactory, the patron stated that it is low, but that the new service meets their needs.

Bus operating cost per passenger increased by 9.3 percent during the audit period. Operating cost per revenue hour grew 3.4 percent and operating cost per revenue mile increased 7.7 percent. On-time performance decreased 2.7 percent. These measures reflect that service is less efficient. The New Bus Network was launched near the end of the audit period; therefore, its benefits are not reflected in the current performance measures.

Section 4. Rail Operations

4.1 Rail Service

METRO's 13-mile Red Line opened in 2004 and now carries over 45,000 passengers a year. The Red Line was expanded in December 2013, offering fast and convenient rail service from the Northline Transit Center/Houston Community College to Fannin South. Featured stops include downtown, the Museum District, the Texas Medical Center and NRG Stadium. The Red Line provides six-minute headways between 3:35 am to 7:47 pm during the week, 12-minute headways between 7:47 pm and 9:00 pm, and 18-minute headways from 9:00 pm to 11:24 pm. Weekend service is provided with 12-minute headways from 4:29 am to 8:42 pm and 18-minute headways from 8:42 pm to 12:00 am.

METRO opened the 3.3-mile Green Line extension during the audit period in 2015. The Green Line has nine stations and travels along Harrisburg Street from Magnolia Park Transit Center through the historic East End to a variety of downtown entertainment and business destinations. The portion of track closest to downtown is shared with the Purple Line and travels to the University of Houston's central campus and the Palm Center. The Green Line will go to the Magnolia Park Transit Center when the Harrisburg Bridge is completed.

METRO also opened the 6.6-mile Purple Line during the audit period in 2015. The Purple Line has 10 stations and travels downtown southeast along Capitol and Rusk to the Palm Center. It runs through one of Houston's oldest African American communities and connects to Texas Southern University and the University of Houston. The last section of the trackway is shared with the Green Line, which enables riders to transfer downtown. Riders can also transfer to the Red Line at Central Station Main.

4.2 Consultant Assessment

The consultants rode the rail system almost every day for five weeks. Each line was traveled from end to end. Service is frequent; therefore, there is no need for a schedule. There were crowded conditions on the train itself at the Medical Center area; one car was almost full to capacity approximately 200 patrons. In addition, there were many cars crossing the rail lines into and out of the hospital parking garages. One car stalled on the tracks in front of a train. The car delayed the train for approximately three minutes.

The stations were clean, well-lit, and contained signs in both English and Spanish. Announcements on the train were clear and in English and Spanish. There were customers having difficulty buying a metro card; but were aided by METRO employees. Other amenities include features for the visually impaired. Such patrons can use them on the rail cars to know when they are approaching the exit and to identify their destination. Both the rail car and platform design enhances METRO's accessibility and customer service.

The consultant team spoke with many rail patrons. The consensus received from patrons was that they were generally satisfied with the rail system and it is comfortable, clean, convenient and on-time. The only negative feedback received was in regards to the number of homeless on and around the system. METRO is aware that the homeless population on trains and at stations in downtown Houston presents a challenge. The homeless can be found on the streets leading up to stations and often on trains as they are generally transit dependent and can receive fare payment from social service agencies. The consultant team observed that the Red Line's Wheeler Street Station is inundated with the homeless population. To address this issue, METRO has deployed its police department and other METRO personnel to manage the situation. Nevertheless, patrons still express concern about being approached by panhandlers as they use the system.

During the audit period, METRO continued its expansion plans for rail service. With the implementation and/or expansion of any transit service, there will be increased operating costs. As operating cost is used as the basis (numerator) for calculating performance indicators used in measuring the effectiveness in service, there will be a direct correlation with service efficiency, if the denominator does not keep pace. In the case over the audit period, rail operating costs grew at 192.6 percent. This level of growth does not correlate with the growth in efficiency measurements such as: passenger trips, revenue hours, revenue miles, and fare revenue. As a result, many of the performance indicators showed declines in service efficiency from FY 2012 to FY 2015. The cost per passenger increased by 116.6 percent, the cost per revenue hour increased by 44.2 percent, the cost per revenue mile increased by 50.4 percent, and fare recovery ratio decreased by 58.5 percent. Following the trend of declining service efficiency, service quality also declined, but not at the same rate. Only two of the four performance indicators saw the barometer moving downward: rail on-time performance declined by 12.8 percent and rail miles between mechanical road calls declined by 32.4 percent.

The assessment of METRO's service efficiency and quality presents opportunities for improvement. Overall, METRO's rail service meets the needs of its patrons – a goal many systems strive to attain. METRO is working to implement strategies that can take advantage of the service area, through initiatives to increase visibility, address safety issues and increase on-time performance. Section 6 of this report presents recommendations to METRO to assist in these efforts.

Section 5. Paratransit Operations

5.1 Paratransit Service

METROLift is the complementary paratransit service. METROLift provides curb-to-curb and door to door service for people with disabilities. There are four modes of METROLift service: van, minivan, taxi cab backup and taxi cab service.

- Van service is provided by a third-party contractor, First Transit. First Transit operates 156 vans which are provided by METRO. First Transit provides drivers, training and maintenance for the program.
- Minivan service is provided by the Greater Houston Transportation Company (Yellow Cab), which operates 272 dedicated wheelchair accessible minivans. The vans are provided by Yellow Cab. In addition to the vehicles, Yellow Cab provides drivers, training, maintenance, radios and Trapeze (dispatching software) mobile data terminals.
- Taxicab backup service is also provided by Yellow Cab. All the cabs used in the service are wheelchair accessible. The Yellow Cab drivers in the program all have ADA passenger training. Taxicab backup service is provided for trips that METROLift cannot accommodate.
- METROLift Taxi service is taxi cab service for METROLift patrons who would like same-day service, same-day trip changes, and/or last minute changes that cannot be met by METROLift van, minivan, or taxicab backup service. To book a trip, patrons call Yellow Cab for service. The patron pays Yellow Cab \$1.00 and METRO pays Yellow Cab \$8.00 for a total trip cost of \$9.00. The patron then pays any cost over the \$9.00 fare.

5.2 Consultant Assessment

Due to the uniqueness of this service, the consultant team was unable to use the service and can therefore make no assessment on a firsthand basis. However, when compared with systems like the METROLift service, it is considered very capable because of the convenience of the same day service. Most other transit systems do not offer same day.

Though the assessment of paratransit service is limited to interpretation of the performance indicators and interviews of METROLift staff, the trends observed appear to be in line with METRO projections. Service is growing faster than expected as demand increases. METROLift operating costs increased 43.9 percent contributing to the operating cost per passenger increase over the audit period of 26.5 percent. Operating cost per revenue hour increased 19.1 percent and operating cost per revenue mile increased by 28.4 percent. As with bus and rail service, these measures indicate that the efficiency and effectiveness of the service is declining. METRO has already begun addressing these trends by increasing fares in FY 2016 from \$1.15 to \$1.25. The expected effect on this particular initiative is to increase paratransit revenue and reduce operational cost indicators. METRO is expected to continue to monitor paratransit cost and demand to ensure that costs keep pace with budget goals.

Section 6. Recommendations

Findings documented in previous sections of the operations review indicate areas of positive performance as well as opportunities for improved effectiveness, efficiency and productivity. This section includes detailed recommendations to capitalize on these improvement opportunities. Rather than viewing the recommendations as negative, they should be balanced against METRO's positive performance results during the audit review period, as noted throughout this report.

Recommendations offered for METRO's consideration address opportunities to improve performance trends. Recommendations concerning compliance with state legislative requirements are provided in a separate report summarizing the results of the compliance assessment. Additional recommendations are also included in the report on METRO's performance indicator trends.

Audit recommendations are the results of findings in four key areas. While there is overlap among the recommendations such that a recommendation in one area may also be relevant to another area, they are broadly categorized as follows:

- Performance measures
 - Recommendation 1: Augment the results of the review of METRO's transportation operations with an evaluation of METRO's goals and objectives
 - Recommendation 2: Improve fare recovery rate
 - Recommendation 3: Improve rail on-time performance
 - Recommendation 4: Increase the number of High Occupancy Vehicle (HOV) lanes
- Ridership
 - Recommendation 5: Evaluate ridership trends and identify opportunities to target new transit markets
 - Recommendation 6: Enhance ridership with an updated marketing campaign, aligning to population targets
 - Recommendation 7: Take advantage of the opportunities presented by the upcoming Super Bowl
- Transit Image
 - Recommendation 8: Formalize a plan to show the benefits of public transit
 - Recommendation 9: Work with the city and social service organizations to reduce the impact of vagrancy, loitering, and panhandling on and around METRO transit facilities

- Safety-related
 - Recommendation 10: Make the area around the downtown rail line a transit-only corridor.

For each of the above recommendations, the context, specific implementation steps, and expected results are provided in the remainder of this section.

6.1 Recommendation 1: Augment the Results of the Review of METRO's Transportation Operations with an Evaluation of METRO's Goals and Objectives

Issue and Opportunity. METRO's management recognizes that an audit of METRO's transportation functions can only partially explain the audit period performance trends. Operating efficiency, effectiveness, productivity and service quality indicators reflect the result of decisions made in other operational areas, as well as in transportation.

To fully analyze performance results and to provide an accurate picture of operations, a transit agency would augment a performance audit such as this, with practical evaluations. For example, evaluation of a service availability measurement like on-time performance may include an evaluation of pull outs, vehicle and operator availability, and other factors beyond METRO's control such as road conditions, etc.

Recommended Action. METRO should undertake a review of the rail and bus service internal goals and objectives to determine if there are opportunities to improve efficiency, effectiveness, productivity and service quality.

Expected Result. A comprehensive evaluation of goals and objectives could lead to broader improved performance measures.

6.2 Recommendation 2: Improve Fare Recovery Ratio

Issue and Opportunity. METRO's fare recovery ratio is 13.7; it fell 14.4 percent during the audit period from FY 2012 to FY 2015. Fare recovery is a standard measure of the portion of the trip cost paid by the passenger.

Recommended Action. Review the cost structure and discounts for METRO service. Increase ridership to fill empty seats on buses and trains on existing service.

Expected Results. METRO's fare recovery ratio will more closely align with industry standards.

6.3 Recommendation 3: Improve Rail On-time Performance

Issue and Opportunity. METRO's rail on-time performance decreased by 12.8 percent from 97.3 percent in FY 2012 to 84.8 percent in FY 2015.

Recommended Action. Improve the reliability of train service by fixing the rail axle signal interface system.

Expected Result. Improved service reliability and increased on-time performance.

6.4 Recommendation 4: Increase the Number of HOV lanes

Issue and Opportunity. METRO has challenges with traffic congestion on major highways. HOV lanes provide efficiency by moving more people in fewer vehicles. HOV lanes also encourage ridesharing and transit use.

Recommended Action. METRO should increase the number of HOV lanes in and around Houston.

Expected Result. Increased on-time performance for bus service, greater service reliability and increased ridership from stakeholders who see buses moving while they are delayed in traffic congestion.

6.5 Recommendation 5: Evaluate Ridership Trends and Identify Opportunities to Target New Transit Markets

Issue and Opportunity. METRO's ridership downtown fell during the audit period because of the relocation of work centers and ridership population within the METRO service area. Nevertheless, the city remains one of the nation's fastest growing cities, and the Harris County region one of the fastest growing regions in the country. Work centers are now located north and west of downtown and the population center of the region has shifted to the southwest. Shell Oil Company will be moving its offices west of downtown, but still remains within the METRO service area. To address this shift, METRO has been improving service west and south of downtown with its New Bus Network. Consequently, rail cars and buses downtown operate with capacity. Attracting new ridership is one of METRO's primary goals. It is important for METRO to have a clear understanding of the causes of ridership loss and amenities needed to attract potential transit users.

Recommended Action. METRO staff should analyze and explain ridership patterns on a regular basis. This includes considering a full range of possible factors (including those that are out of METRO's control as well as those that METRO can control), such as the weather, service levels, congestion, convenience, land use patterns, etc., and the insights they can provide. METRO should also evaluate opportunities to target new transit markets, especially with plans to implement transit extensions and service improvements.

Expected Result. METRO will increase the potential ridership population and overall ridership downtown.

6.6 Recommendation 6: Enhance Ridership with an Updated Marketing Campaign, Aligning to Population Targets

Issue and Opportunity. The Greater Houston area is home to multiple universities. The university students, at well over 70,000 people, are prime candidates for downtown living post-graduation.

Recommended Action. METRO should target marketing to Millennials, which at approximately 75 million people worldwide, is the largest generation since the Baby Boomers. These are the new graduates from the universities. They are sophisticated, technology savvy and immune to most traditional marketing efforts.

METRO should analyze ridership trends to provide data and insights into the reasons for the recent downward trends in bus ridership and the other performance measures that are impacted by ridership, such as service consumption and fare recovery ratios. Trend data analysis will assist METRO in designing programs to attract ridership and meet targets related to ridership.

Expected Result. METRO will experience increases in the number of Millennials living downtown. Downtown Houston will become the desirable place to live, work and play equating to increased ridership.

6.7 Recommendation 7: Take Advantage of the Opportunities Presented by the Upcoming Super Bowl

Issues and Opportunity. On February 5, 2017, the 51st National Football League (NFL) Super Bowl will be hosted in Houston. The game will be played at NRG Stadium. Super Bowl LIVE is a festival associated with the Super Bowl that will run from January 28, until February 5, 2017. Super Bowl LIVE is a free event with food, music, entertainment, attractions and more to allow the entire city to experience the Super Bowl. More than one million people are expected to attend the event.

Recommended Action. METRO should use the platform of the Super Bowl to showcase its transit system. With over one million people attending the Super Bowl, METRO has a unique opportunity to reach potential riders from all over the world.

Expected Result. Increased ridership on METRO. Potential riders in and around Houston get to experience riding METRO firsthand, while enjoying the Super Bowl activities. METRO's name and reputation will be shared all over the world.

6.8 Recommendation 8: Formalize a Plan to Show the Benefits of Public Transit

Issue and Opportunity. In 2015 and per the American Public Transportation Association, METRO is one of the best transit systems in the United States. Public transit encourages healthy living, and helps save the environment as well as money.

Recommended Action. METRO should create a campaign that focuses on the benefits of transit use. There is unique opportunity to inspire the next generation of transit users.

Expected Result. Using public transit in Houston will be promoted as the only viable opportunity to promote longevity. People who use public transit will be seen as smart, healthy, efficient and invested in the environment. METRO will change the perception of using public transit.

6.9 Recommendation 9: Work with the City and Social Service Organizations to Reduce the Impact of Vagrancy, Loitering, and Panhandling on and around METRO Transit Facilities

Issue and Opportunity. In observations and interviews with riders, METRO's ridership on the rail is likely impacted by vagrancy, loitering, and panhandling on and around the transit system. METRO has launched initiatives to address this issue with its police department; however, a more holistic and cost effective approach could be to engage social service agencies to help address the underlying issues.

Recommended Action. Work with the city and social service agencies to address the negative impact this issue has on rail ridership.

Expected Result. METRO's ridership improves and the cost of policing the system reduces.

6.10 Recommendation 10: Make the Area around the Downtown Rail Line a Transit-only Corridor

Issue and Opportunity. The downtown rail line (Red Line) is the focal point of METRO's rail service. It is an efficient and reliable service operating with six-minute headways during the day. Making the rail line downtown a transit only corridor will increase safety and aid customer access to the rail line.

Recommended Action. Make the Red Line downtown corridor a transit only corridor and eliminate access by other motorized vehicles.

Expected Results. Improve rail safety by eliminating potential accidents that can occur when there are obstructions on or close to the rail right of way.

Section 7. Summary

METRO has an excellent transit system. It provides safe, efficient, reliable cost effective service to stakeholders in and around Houston and the 14 municipalities in the service area. It adjusts service to meet the needs of the community. The recommendations provided are intended to enhance the system. As one of the fastest growing cities in the United States, there is opportunity in Houston's downtown area for METRO to capitalize on that growth which can directly correlate to increased ridership. To do so, METRO needs to expand its marketing outreach and build relationships with Houston's many universities to ensure that the generations of students attending become transit patrons. In 2017, Houston will be hosting the Super Bowl. METRO needs to be a part of the discussion and ultimate solution regarding vagrancy, loitering, and panhandling on and around the transit system. METRO should work with social service agencies, churches and the city to address this issue. The ultimate outcome of any collaboration to address this challenge could stem the loss of ridership.

Appendix A: Operating Data by Performance Indicator

Information in the table below includes both operating statistics and performance measures used to calculate the nine state-mandated performance indicators. Each performance indicator has been calculated at the mode level for each of the three services that METRO operates (i.e., bus, light rail, paratransit), as well as at the system-wide level.

Performance Indicators per Transportation Code Sec 451.454 (c) (3) (A-G)					
KPI	Code Sec	FY2012	FY2013	FY2014	FY2015
Operating cost per passenger	451.454 (c) (3) (A)	5.11	5.02	5.20	5.66
Operating cost per revenue mile	451.454 (c) (3) (A)	7.30	7.23	7.35	8.13
Operating cost per revenue hour	451.454 (c) (3) (A)	108.34	109.83	110.72	121.06
Sales and use tax receipts per passenger	451.454 (c) (3) (B)	7.27	7.52	7.94	8.34
Fare recovery rate	451.454 (c) (3) (C)	16.0%	16.4%	15.7%	13.7%
Average vehicle occupancy	451.454 (c) (3) (D)	9.43	9.80	10.04	9.56
On-time performance Bus	451.454 (c) (3) (E)	73.3%	73.0%	71.6%	71.3%
On-time performance Rail	451.454 (c) (3) (E)	97.3%	97.7%	N/A*	84.8%
Number of Bus accidents per 100,000 miles	451.454 (c) (3) (F)	0.73	0.69	0.750	0.75
Number of Rail accidents per 100,000 miles	451.454 (c) (3) (F)	3.65	3.53	3.220	3.38
Number of miles between mechanical road calls	451.454 (c) (3) (G)	9,664	9,932	10,493	9,568
Additional Data					
		FY2012	FY2013	FY2014	FY2015
Operating Cost		414,014,072	423,778,259	443,667,743	487,907,171
Passenger Fare Revenue		66,371,822	69,308,172	69,664,941	66,959,131
Unlinked Passenger Trips		80,941,271	84,461,053	85,396,225	86,142,484
Revenue Vehicle Hours		3,821,567	3,858,491	4,006,936	4,030,235
Revenue Vehicle Miles		56,684,878	58,608,515	60,357,393	59,983,144
Total Vehicle Miles		64,319,413	66,929,707	68,595,384	71,938,298
Passenger Miles		534,369,113	574,228,412	606,140,282	573,489,760
Accidents**		175	180	155	163
Mechanical Roadcalls		4,323	4,198	3,890	4,116
For Calculations Only					
Sales Tax Receipts		588,278,273	635,541,981	677,912,303	718,386,911
NTD Passenger Miles					
		534,369,113	574,228,412	606,140,282	573,489,760
Rail - DO	LRDO	24,960,750	26,539,382	33,086,541	40,873,954
NonRail-CB-DO	CBDO	98,265,706	111,621,454	113,922,475	104,341,266
NonRail - CB - PT	CBPT	33,177,914	36,610,457	36,879,518	37,675,477
NonRail-DR-PT	DRPT	17,543,948	17,653,456	18,415,314	18,303,305
NonRail-DT-PT	DTPT	1,305,541	1,589,420	2,385,192	2,779,128
NonRail-MB-DO	MBDO	235,148,457	254,630,331	277,366,204	249,047,779
NonRail-MB-PT	MBPT	54,461,474	56,169,997	54,511,638	48,976,992
NonRail-VP-PT	VPPT	69,505,323	69,413,915	69,573,400	71,491,859
* N/A - Not Available; in FY2014 there is only OTP data available for two months due to problems with a contractor who was at the time responsible for collecting this data. This function was subsequently brought in-house.					
** NTD reportable accidents including rail and bus operated by METRO					

The operating expenses/revenues used to calculate the performance indicators by mode of transportation includes rail, bus, and paratransit as reported in the National Transit Database. HOV/HOT Lane and vanpool revenue and expenses have not been included in this worksheet.

Appendix B: Performance Data by Mode

The performance indicators included in this appendix are reported by mode of each of the three modes that METRO operates (i.e., bus, light rail, paratransit).

In addition to the nine state-mandated performance indicators, two additional performance indicators are included that are often reported as a basis for evaluating performance: passengers per revenue hour and passengers per revenue mile.

Fare Recovery Ratios

Fare Recovery Ratios	FY2012	FY2013	FY2014	FY2015
METROrail				
Fare Revenue	3,978,767	4,483,444	4,735,304	4,830,770
Operating Cost	17,365,999	18,385,544	37,852,111	50,817,373
Recovery Ratio	0.2291	0.2439	0.1251	0.0951
Bus				
Fare Revenue	60,302,288	63,001,223	62,950,672	60,221,925
Operating Cost	334,021,714	352,301,591	341,877,097	369,542,750
Recovery Ratio	0.1805	0.1788	0.1841	0.1630
METROLift				
Fare Revenue	1,524,759	1,595,110	1,606,540	2,001,173
Operating Cost	40,594,214	46,189,792	48,994,159	58,419,757
Recovery Ratio	0.0376	0.0345	0.0328	0.0343
NTD Reported Op Exp (F-30)				
CBDO - Commuter Bus Directly Operated	36,913,400	40,081,830	45,737,795	49,705,091
CBPT - Commuter Bus Purchased Transportation	7,209,288	7,314,721	9,452,738	9,620,651
DRPT - Demand Response Purchased Transportation	37,663,281	42,434,900	44,356,460	52,380,394
DTPT - Demand Taxi Purchased Transportation	2,930,933	3,754,892	4,637,699	6,039,363
LRDO - Light Rail Directly Operated	17,365,999	18,385,544	37,852,111	50,817,373
MBDO - Motor Bus Directly Operated	245,851,608	260,699,069	232,201,669	254,417,334
MBPT - Motor Bus Purchased Transportation	44,047,418	44,205,971	54,484,895	55,799,674
NTD Reported Rev (F-10)				
CBDO - Commuter Bus Directly Operated	22,207,584	23,006,184	23,828,690	23,193,847
CBPT - Commuter Bus Purchased Transportation	5,492,565	5,878,857	6,029,881	6,867,337
DRPT - Demand Response Purchased Transportation	1,265,876	1,345,185	1,324,316	1,655,191
DTPT - Demand Taxi Purchased Transportation	258,883	249,925	282,224	345,982
LRDO - Light Rail Directly Operated	3,978,767	4,483,444	4,735,304	4,830,770
MBDO - Motor Bus Directly Operated	26,243,497	27,365,418	26,590,787	25,189,892
MBPT - Motor Bus Purchased Transportation	6,358,642	6,750,764	6,501,314	4,970,849

The operating expenses/revenues used to calculate the performance indicators by mode of transportation includes rail, bus, and paratransit as reported in the National Transit Database. HOV/HOT Lane and vanpool revenue and expenses have not been included in this worksheet.

Operating Cost Per Passenger

Operating Cost per Passenger	FY2012	FY2013	FY2014	FY2015
Total Operating Cost	391,981,927	416,876,927	428,723,367	478,779,880
% change		6.35%	2.84%	11.68%
Bus	334,021,714	352,301,591	341,877,097	369,542,750
% change		5.47%	-2.96%	8.09%
Rail	17,365,999	18,385,544	37,852,111	50,817,373
% change		5.87%	105.88%	34.25%
Paratransit	40,594,214	46,189,792	48,994,159	58,419,757
% change		13.78%	6.07%	19.24%
Total Passenger Trips				
Total Passenger Trips	78,443,377	81,793,775	82,839,357	83,449,998
% change		4.27%	1.28%	0.74%
Bus	65,461,887	68,601,927	68,190,293	66,267,956
% change		4.80%	-0.60%	-2.82%
Rail	11,309,468	11,440,171	12,783,877	15,280,311
% change		1.16%	11.75%	19.53%
Paratransit	1,672,022	1,751,677	1,865,187	1,901,731
% change		4.76%	6.48%	1.96%
Total Operating Cost/ Passenger				
Total Operating Cost/ Passenger	5.00	5.10	5.18	5.74
% change		1.99%	1.54%	10.86%
Bus	5.10	5.14	5.01	5.58
% change		0.64%	-2.37%	11.23%
Rail	1.54	1.61	2.96	3.33
% change		4.66%	84.24%	12.32%
Paratransit	24.28	26.37	26.27	30.72
% change		8.61%	-0.38%	16.95%
NTD Data				
CBDO - Commuter Bus Directly Operated	36,913,400	40,081,830	45,737,795	49,705,091
CBPT - Commuter Bus Purchased Transportation	7,209,288	7,314,721	9,452,738	9,620,651
DRPT - Demand Response Purchased Transportation	37,663,281	42,434,900	44,356,460	52,380,394
DTPT - Demand Taxi Purchased Transportation	2,930,933	3,754,892	4,637,699	6,039,363
LRDO - Light Rail Directly Operated	17,365,999	18,385,544	37,852,111	50,817,373
MBDO - Motor Bus Directly Operated	245,851,608	260,699,069	232,201,669	254,417,334
MBPT - Motor Bus Purchased Transportation	44,047,418	44,205,971	54,484,895	55,799,674
VPPT - Van Pool Purchased Transportation	13,119,035	9,213,857	10,692,505	10,934,421

The operating expenses/revenues used to calculate the performance indicators by mode of transportation includes rail, bus, and paratransit as reported in the National Transit Database. HOV/HOT Lane and vanpool revenue and expenses have not been included in this worksheet.

Operating Cost Per Revenue Hour

Operating Cost per Revenue Hour				
	FY2012	FY2013	FY2014	FY2015
Total Operating Cost	391,981,927	416,876,927	428,723,367	478,779,880
% change		6.35%	2.84%	11.68%
Bus	334,021,714	352,301,591	341,877,097	369,542,750
% change		5.47%	-2.96%	8.09%
Rail	17,365,999	18,385,544	37,852,111	50,817,373
% change		5.87%	105.88%	34.25%
Paratransit	40,594,214	46,189,792	48,994,159	58,419,757
% change		13.78%	6.07%	19.24%
Total Revenue Hours				
Total Revenue Hours	3,624,856	3,813,336	3,876,571	4,066,772
% change		5.20%	1.66%	4.91%
Bus	2,646,859	2,833,629	2,752,113	2,831,105
% change		7.06%	-2.88%	2.87%
Rail	65,203	64,900	85,014	132,321
% change		-0.46%	30.99%	55.65%
Paratransit	912,794	914,807	1,039,444	1,103,346
% change		0.22%	13.62%	6.15%
Total Operating Cost/ Rev Hour				
Total Operating Cost/ Rev Hour	108.14	109.32	110.59	117.73
% change		1.09%	1.16%	6.45%
Bus	126.20	124.33	124.22	130.53
% change		-1.48%	-0.08%	5.08%
Rail	266.34	283.29	445.25	384.05
% change		6.37%	57.17%	-13.75%
Paratransit	44.47	50.49	47.13	52.95
% change		13.53%	-6.65%	12.33%
NTD Data				
	FY2012	FY2013	FY2014	FY2015
CBDO - Commuter Bus Directly Operated	36,913,400	40,081,830	45,737,795	49,705,091
CBPT - Commuter Bus Purchased Transportation	7,209,288	7,314,721	9,452,738	9,620,651
DRPT - Demand Response Purchased Transportation	37,663,281	42,434,900	44,356,460	52,380,394
DTPT - Demand Taxi Purchased Transportation	2,930,933	3,754,892	4,637,699	6,039,363
LRDO - Light Rail Directly Operated	17,365,999	18,385,544	37,852,111	50,817,373
MBDO - Motor Bus Directly Operated	245,851,608	260,699,069	232,201,669	254,417,334
MBPT - Motor Bus Purchased Transportation	44,047,418	44,205,971	54,484,895	55,799,674
VPPT - Van Pool Purchased Transportation	13,119,035	9,213,857	10,692,505	10,934,421

The operating expenses/revenues used to calculate the performance indicators by mode of transportation includes rail, bus, and paratransit as reported in the National Transit Database. HOV/HOT Lane and vanpool revenue and expenses have not been included in this worksheet.

Operating Cost Per Revenue Mile

Operating Cost per Revenue Mile				
	FY2012	FY2013	FY2014	FY2015
Total Operating Cost	391,981,927	416,876,927	428,723,367	478,779,880
% change		6.35%	2.84%	11.68%
Bus	334,021,714	352,301,591	341,877,097	369,542,750
% change		5.47%	-2.96%	8.09%
Rail	17,365,999	18,385,544	37,852,111	50,817,373
% change		5.87%	105.88%	34.25%
Paratransit	40,594,214	46,189,792	48,994,159	58,419,757
% change		13.78%	6.07%	19.24%
Total Revenue Miles	56,328,032	57,800,386	58,551,143	60,057,169
% change		2.61%	1.30%	2.57%
Bus	39,702,012	41,185,677	40,100,204	40,783,087
% change		3.74%	-2.64%	1.70%
Rail	769,903	766,205	1,059,792	1,497,650
% change		-0.48%	38.32%	41.32%
Paratransit	15,856,116	15,848,504	17,391,147	17,776,432
% change		-0.05%	9.73%	2.22%
Total Operating Cost/ Revenue Mile	6.96	7.21	7.32	7.97
% change		3.64%	1.52%	8.88%
Bus	8.41	8.55	8.53	9.06
% change		1.67%	-0.33%	6.28%
Rail	22.56	24.00	35.72	33.93
% change		6.38%	48.85%	-5.00%
Paratransit	2.56	2.91	2.82	3.29
% change		13.84%	-3.34%	16.65%
NTD Data	FY2012	FY2013	FY2014	FY2015
CBDO - Commuter Bus Directly Operated	36,913,400	40,081,830	45,737,795	49,705,091
CBPT - Commuter Bus Purchased Transportation	7,209,288	7,314,721	9,452,738	9,620,651
DRPT - Demand Response Purchased Transportation	37,663,281	42,434,900	44,356,460	52,380,394
DTPT - Demand Taxi Purchased Transportation	2,930,933	3,754,892	4,637,699	6,039,363
LRDO - Light Rail Directly Operated	17,365,999	18,385,544	37,852,111	50,817,373
MBDO - Motor Bus Directly Operated	245,851,608	260,699,069	232,201,669	254,417,334
MBPT - Motor Bus Purchased Transportation	44,047,418	44,205,971	54,484,895	55,799,674
VPPT - Van Pool Purchased Transportation	13,119,035	9,213,857	10,692,505	10,934,421

The operating expenses/revenues used to calculate the performance indicators by mode of transportation includes rail, bus, and paratransit as reported in the National Transit Database. HOV/HOT Lane and vanpool revenue and expenses have not been included in this worksheet.

Significant Events

In FY 2014 the Red Line expansion opened for revenue service; increasing operating costs.

In FY 2015 the Green and Purple Lines opened for revenue service; increasing operating costs.