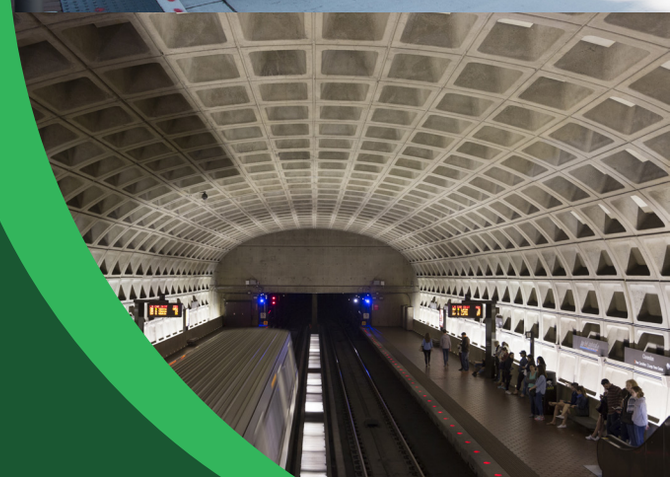
Report on the Performance and Condition of the Washington Metropolitan Area Transit Authority



NVTC

NORTHERN VIRGINIA TRANSPORTATION COMMISSION

THE VOICE OF TRANSIT IN NORTHERN VIRGINIA

Submitted to the Governor and the General Assembly

November 2018

NORTHERN VIRGINIA TRANSPORTATION COMMISSION

November 1, 2018

On behalf of the Northern Virginia Transportation Commission (NVTC), I am pleased to submit this Report on the Performance and Condition of the Washington Metropolitan Area Transit Authority (WMATA). This is the first report to respond to NVTC's new responsibilities as established by the Omnibus Transit Funding Bill [House Bill 1539/Senate Bill 856 (2018)] § 33.2-3402.

In addition to fulfilling our new reporting requirements, NVTC continues to provide funding oversight and stewardship of WMATA on behalf of its member jurisdictions through the management of state assistance to the transit agency and its appointments to the WMATA Board of Directors.

This initial report presents data vital to understanding the performance and conditions of Metrorail and Metrobus and serves as a baseline for future years. It also identifies potential strategies to reduce the growth in WMATA's costs and to improve the efficiency of its operations. NVTC developed these strategies in coordination with our local jurisdictions, which are responsible for funding WMATA.

The dedicated funds authorized by the Omnibus Transit Funding Bill will support WMATA's capital investments, which are designed to improve both safety and state of good repair. These improvements are critical to the economic health of the Commonwealth and Northern Virginia. NVTC looks forward to reporting annually on the performance and condition of WMATA.

Best regards,

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Chairman

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Introduction

The Northern Virginia Transportation Commission (NVTC)[1] is charged with the funding and stewardship of the Washington Metropolitan Area Transit Authority (WMATA) on behalf of the jurisdictions of Arlington County, City of Alexandria, City of Falls Church, Fairfax County, City of Fairfax, and Loudoun County. Founded in 1964, in part to represent the interests of the Commonwealth during the creation of Metrorail, NVTC continues to serve as Virginia's voice on the WMATA Board of Directors[2] through its appointments to the board. NVTC also manages more than $154 million in state assistance to WMATA on behalf of its jurisdictions. Finally, NVTC conducts Northern Virginia's regional transit response program, coordinates regional transit fare collection efforts, and engages in regional transportation planning, data analysis, and reporting that provide direct benefits to WMATA and the related Northern Virginia transit network.

Virginia's Omnibus Transit Funding Bill [House Bill 1539/Senate Bill 856 (2018)] § 33.2-3402 increases NVTC's responsibilities regarding its role in WMATA oversight and reporting. It directs NVTC to report to the Governor and the General Assembly on the performance of WMATA, for both Metrorail and Metrobus, every year by November 1. This is the first report to respond to this new legislative requirement.

Per statute, the report addresses six elements:

1. The **safety** and **reliability** of the **rapid heavy rail** mass transportation system and **bus** network
2. The **financial performance** of WMATA related to the operations of the **rapid heavy rail** mass transportation system, including farebox recovery, service per rider, and cost per service hour
3. The **financial performance** of WMATA related to the operations of the **bus** mass transportation system, including farebox recovery, service per rider, and cost per service hour
4. **Potential strategies to reduce the growth in such costs** and **to improve the efficiency** of **WMATA operations**

[1] NVTC was established to manage and control the functions, affairs, and property of the Northern Virginia Transportation District, which was created by the 1964 Acts of Assembly of the Commonwealth of Virginia, Chapter 630, and the Transportation District Act. The purpose of the Act is to facilitate "planning and developing a transportation system for Northern Virginia and for the safety, comfort and convenience of its citizens and for the economical utilization of public funds." The duties and powers of the Commission are set forth in Sections 33.2-1900 through 33.2-1934 of the Virginia Code.

[2] The WMATA Board of Directors, established through an interstate compact between Virginia, Maryland and the District of Columbia, determines agency policy and provides oversight for funding, operations, and the expansion of transit facilities.

5. **Use of the funds** authorized by the legislation to improve the safety and condition of the **rapid heavy rail** mass transportation system
6. **Ridership** of the **rapid heavy rail** mass transportation system and the **bus** mass transportation system

Much of the data used in this report is extracted from the National Transit Database (NTD) of the Federal Transit Administration (FTA). On an annual basis[3] NTD publishes safety, operating and financial data for each transit agency in the country that receives federal transit grant funding. For legislative requirements for which NTD data is unavailable, such as system reliability, data is extracted from the Metro Performance Report (MPR) published by WMATA on a quarterly basis. Table 1 summarizes the data sources for each category of the report, as well as the latest full fiscal or calendar year for which data is available.

Table 1: Data Sources and Years Presented in this Report

Legislative Item No.	Report Category	Year for which Data Is Publicly Available	Data Source
1	Safety	Calendar Year 2017	NTD
	Reliability	Fiscal Year 2017	MPR
2,3	Financial Performance	Fiscal Year 2017	NTD
4	Cost Reduction Strategies	Developed by NVTC	
5	Use of Funds	To Be Provided in Future Years	
6	Ridership	Fiscal Year 2017	NTD

For this report, data is generally provided for fiscal or calendar year 2017. The source of safety data is NTD. FTA publishes NTD safety data on a calendar year rather than a fiscal year basis[4].

[3] Monthly for some data such as ridership.

[4] There is a strong connection between operational and financial performance, which makes it important that the time periods of such data are aligned. The fact that safety data is not synchronized with financial performance data does not impact the analysis presented in this report.

This report includes six sections based on the six legislative requirements. Each section summarizes data in table format, with notes describing key information and definitions:

- Section 1: Safety and Reliability of Metrorail and Metrobus
- Section 2: Financial Performance of Metrorail
- Section 3: Financial Performance of Metrobus
- Section 4: Potential Strategies to Reduce Cost Growth and Improve Efficiency
- Section 5: The Use of Funds from the WMATA Capital Fund
- Section 6: Ridership of Metrorail and Metrobus
- Appendix: Definitions

1. Safety & Reliability

Passenger and employee safety and security is the highest priority for WMATA. WMATA seeks to provide a safe and secure environment by minimizing the risk of death, injury, illness, and property damage. The American Public Transportation Association (APTA) reported that public transit is one of the safest modes of transportation. Fatalities of urban mass rail transit and buses are 0.33 and 0.2 per billion person-miles respectively, whereas that of cars and light trucks (drivers and passengers) is 6.53.[5] The newly created Metro Safety Commission (MSC)[6] will provide independent safety oversight of WMATA, supporting the WMATA Board of Directors' and General Manager's emphasis on system safety.

Transit operators also seek to provide reliable service to passengers. Reliability can be measured in terms of a transit service's on-time performance, as well as the frequency of equipment break downs.

1.1. Safety

Transit systems seek to minimize the frequency of all safety events. The National Transit Database (NTD) measures transit safety by summarizing the total occurrences of certain safety events for rail and bus operations:

1. Collision
2. Derailment
3. Fatality
4. Fire
5. Injury
6. Security event [e.g. "an occurrence of a bomb threat, bombing, arson, hijacking, sabotage, cyber security event, assault, robbery, rape, burglary, suicide, attempted suicide (not involving a transit vehicle), larceny, theft, vandalism, homicide, CBR (chemical/biological/radiological) or nuclear release, or other event"[7]]

Table 2 summarizes the count of each type of Metrorail safety event in calendar year (CY) 2017. The NTD provides safety data on a calendar year basis, and not a fiscal year basis, unlike all

[5] American Public Transportation Association (APTA). "The Hidden Traffic Safety Solution: Public Transportation." September 2016. <www.apta.com/resources/reportsandpublications/Documents/APTA-Hidden-Traffic-Safety-Solution-Public-Transportation.pdf>

[6] Virginia Compacts § 33.2-3101. Washington Metrorail Safety Commission Interstate Compact. <https://law.lis.virginia.gov/compacts/washington-metrorail-safety-commission-interstate-compact/>

[7] Federal Transit Administration (FTA). "National Transit Database (NTD) Glossary." April 12, 2018. <www.transit.dot.gov/ntd/national-transit-database-ntd-glossary>

other data presented in this report. The official NTD definition for each term is provided in the Appendix.

Table 2: Metrorail Safety (CY2017)

NTD Category	Safety Event	Frequency
Events	Collision	2
	Derailment	5
	Security Event	45
	Fire	101
Fatalities	Fatality	2
Injuries	Injury	323

Source: WMATA NTD Report, Form S&S-40[8]

Table 3 summarizes the count of each Metrobus safety event in calendar year 2017.

Table 3: Metrobus Safety (CY2017)

NTD Categorization	Safety Event	Frequency
Events	Collision	165
	Derailment	N/A
	Security Event	38
	Fire	8
Fatalities	Fatality	0
Injuries	Injury	505

Source: WMATA NTD, Form S&S-40[9]

Additional Notes:
The fatality and injury counts presented are the totals of subcategories (passenger, employee, and others) for each respective category.

1.2. Reliability

There is no national standard for reporting transit reliability. The reliability of a transit system may be measured by its punctuality and equipment dependability. Reliability metrics used by WMATA include:

1. **On-time performance** is the rate at which a transit system carries passengers to their destination on time. Per the Metro Performance Report (MPR) published by WMATA, this metric is used to evaluate the timeliness of travel for both rail and bus operations.

[8] S&S-40 is the NTD Major Event Report Form. Reference "S&S-40, Major Event Report" in the Appendix.
[9] Ibid

2. **Mean distance between delays (MDBD)** is the average number of miles that are traveled between failures that delay rail service. MDBD indicates the reliability of the equipment used to transport passengers. Ideally, with no failures, the number of miles between a delay (MDBD) would be nearly infinite because the rail vehicles would never encounter a delay due to failure. On the other hand, if there are frequent failures, then MDBD would be low since trains are disrupted by delays every few miles. The higher the MDBD value, the more reliable the rail system.
3. **Mean distance between failures (MDBF)** is the average number of miles that are traveled before a mechanical breakdown causes the bus to be removed from service or results in delays from schedule. Similar to MDBD (see above), the higher the MDBF, the more reliable the bus system.

A highly reliable transit system has high on-time performance, a high MDBD, and a high MDBF.

Each of these reliability measures is presented below.

1.2.1. On-Time Performance

On-time performance is reported for fiscal year (FY) 2017. For Metrobus, on-time performance reports the number of bus vehicles arriving at a stop at or close to the scheduled arrival time, divided by the total number of vehicles arriving at stop, over a period (in this case, one year). For Metrorail, on-time performance measures the number of trains arriving at a station at or close to a scheduled headway, divided by the total number of station stops over a period (in this case, one year). Reference the Appendix for the standard WMATA definition.

Table 4 summarizes Metrorail and Metrobus on-time performance in FY2017 (Note: FY2017 on-time performance statistics are reported in the FY2018 Metro Performance Report).

Table 4: On-Time Performance by Mode (FY2017)

Transit Mode	Calculation	On-Time Performance
Metrorail	$\frac{\text{Number of trains arriving at a station at or close to a scheduled headway}}{\text{Total number of station stops}}$	79%
Metrobus	$\frac{\text{Number of vehicles arriving at a stop at or close to the scheduled arrival time}}{\text{Total number of vehicles arriving at stops}}$	76%

Source: Fiscal Year 2018 WMATA MPR, pp. 28-31

Additional Notes:

1. Metrorail:
    a. Metrorail on-time performance ***includes***:
        i. Planned shutdowns (of a line or a segment of a line)

ii. Unplanned shutdowns (of a line or a segment of a line)
iii. Single-tracking events

b. Metrorail on-time performance ***excludes***:
   i. Weekends and holidays (if holidays fall on weekdays, operations are based on a weekend schedule)

c. To calculate on-time performance, station stops are tracked system-wide. A train is said to be "on time" if it arrives at a station stop within two minutes of the scheduled headway[10] during peak hours (morning and evening) or 150 percent of the headway during non-peak hours (midday and night)[11].

2. Metrobus
   a. Metrobus on-time performance ***excludes***:
      i. Trips that have not been delivered (missed trips)[12]
      ii. Buses that have deviated from the scheduled route pattern for a detour

1.2.2. Mean Distance between Delays/Failures

Mean distance between delays (MDBD) indicates the average number of miles traveled between failures that delay rail or bus service. Higher MDBD indicates greater reliability of Metro mechanical equipment (e.g. doors, generators, and engines). The Metro Performance Report (MPR) presents MDBD only for Metrorail. Therefore, the equivalent metric for Metrobus, mean distance between failures (MDBF), is presented for bus reliability.

Table 5 summarizes the Metrorail and Metrobus reliability figures for FY2017. When considering MDBD and MDBF for reliability, rail should have a substantially larger average number of miles than buses for two reasons: railcars travel substantially greater distances in a day relative to buses; and buses, like cars, may experience failure every few thousand miles.

Table 5: Equipment Reliability for Metrorail and Metrobus (FY2017)

Mode of Transit	Reliability Metric Used	Value of Reliability Metric	Units
Metrorail	Mean Distance between Delays (MDBD)	79,656	miles
Metrobus	Mean Distance between Failures (MDBF)	8,283	miles

Source: Fiscal Year 2018 WMATA MPR, pp. 28-31

[10] Headways are the duration of time that customers wait between trains.
[11] Per WMATA, peak periods are AM rush (approximately 6 a.m.-9:30 a.m.) and PM rush (approximately 3:15 p.m.-6:30 p.m.). Off-peak periods are midday (approximately 9:45 a.m.-3 p.m.) and night (approximately 6:45 p.m.-close).
[12] A missed trip is a scheduled trip that did not operate for a variety of reasons, including operator absence, vehicle failure, dispatch error, traffic, accident, or other unforeseen reason. American Public Transit Association (APTA). "Glossary of Transit Terminology." 1994. <www4.uwm.edu/cuts/utp/glossary.pdf>

Additional Notes:

1. Metrorail: Mean distance between delays measures the effectiveness of Metro's railcar maintenance and engineering program. Factors that influence railcar reliability are the age and design of the railcars, the distance the railcars have traveled, the frequency and quality of preventive maintenance, and the interaction between railcars and the track.[13]
2. Metrobus: Mean distance between failures is used to monitor trends in vehicle breakdowns that cause buses to go out of service and to plan corrective actions. Factors that influence bus fleet reliability include vehicle age, quality of maintenance program, original vehicle quality, and road conditions affected by inclement weather and road construction.

[13] Washington Metropolitan Area Transit Authority (WMATA). "Metro Performance Report." Fiscal Year 2018. <www.wmata.com/about/records/scorecard/upload/FY18-Metro-Performance-Report.pdf>

2. Metrorail Financial Performance

Transit agencies, as a public service, aim to minimize cost and deliver service as efficiently as possible. The following Metrorail financial performance measures are required by HB1539/SB856 (2018):

1. Farebox recovery
2. Metrorail service per rider
3. Cost per Metrorail service hour

The significance and meaning of these measures are summarized in each subsection below. NTD FY2017 data is reported for each measure.

2.1. Metrorail Farebox Recovery

Farebox recovery indicates how much of an agency's operating costs are recovered through passenger fare revenues. This measure is used to identify how effectively an agency funds its operating costs. A higher recovery ratio indicates that the transit agency recoups a larger share of its operating costs through passenger revenue. (Section 4 summarizes proposed strategies to reduce WMATA operating costs.)

Farebox recovery ratios differ across transit modes. Per the American Public Transportation Association (APTA) 2017 Public Transportation Fact Book[14], rail services generally have higher farebox recovery rates than bus services in the United States. Because rail systems generally have higher fares and higher ridership than bus systems, farebox recovery tends to be higher for rail systems than for bus systems. Per Table 6, Metrorail farebox recovery was 52.6 percent in FY2017.

Table 6: Metrorail Farebox Recovery (FY2017)

Financial Performance Metric	Calculation	Performance	Units
Farebox Recovery	$\frac{\text{Fare Revenue}}{\text{Operating Expenses}}$	52.6%	Revenue to Expense Ratio

Source: WMATA NTD, Form F-10 & F-30[15]

[14] American Public Transportation Association (APTA). "2017 Public Transportation Fact Book." p. 30. March 2018. <www.apta.com/resources/statistics/Documents/FactBook/2017-APTA-Fact-Book.pdf>

[15] Form F-10 is the NTD Sources of Funds — Funds Expended and Funds Earned form, Form S-30 is the NTD Operating Expenses form. <www.transit.dot.gov/ntd/ntd-reporting-system-forms>

Additional Notes:

1. Farebox recovery is calculated by dividing the funds earned (fare revenue) by the total operating expenses (e.g. labor, services for operating and maintaining the transit system, general administration). Reference the Appendix for the official NTD definition.

2.2. Metrorail Service per Rider

Service per rider indicates the number of railcar service hours offered per 10,000 passenger trips. This figure summarizes how efficiently an agency is transporting passengers. Agencies strive to strike a balance between serving as many passengers as possible while providing service at a reasonable cost. A low service per rider number indicates that relatively few hours of service are required to serve 10,000 passengers, which indicates higher efficiency.

Per Table 7, Metrorail service per rider was 141.32 hours per 10,000 trips in FY2017.

Table 7: Metrorail Service per Rider (FY2017)

Financial Performance Metric	Calculation	Performance	Units
Metrorail Service per Rider	$\frac{\text{Vehicle Revenue Hours}}{\text{Trips}} * 10{,}000$	141.32	Hours per 10,000 Trips

Source: WMATA NTD, Form S-10[16]

Additional Notes:

1. Vehicle revenue hours are the duration that a vehicle travels for revenue generation.
2. The factor of 10,000 in the calculation of service per rider is used for readability. Since service per rider is a relative metric, other scaling factors could be used.

2.3. Cost per Metrorail Service Hour

The cost per Metrorail service hour is the average cost[17] associated with the operation and maintenance of one railcar for each hour of passenger revenue service. A lower number indicates a lower hourly cost to operate each railcar.

Heavy rail services in the U.S. generally have a substantially higher cost per service hour than bus services.[18] Per Table 8, the cost per Metrorail service hour was $309.37 in FY2017.

[16] Form S-10 is the NTD Service form. <www.transit.dot.gov/ntd/ntd-reporting-system-forms>
[17] The cost per Metrorail service hour factors in a fully loaded operating and maintenance cost. See the definition of Operating Expenses.
[18] APTA. "2017 Public Transportation Fact Book." p. 30.

Table 8: Cost per Metrorail Service Hour (FY2017)

Financial Performance Metric	Calculation	Performance	Units
Cost per Metrorail Service Hour	$\frac{\text{Operating Expenses}}{\text{Vehicle Revenue Hours}}$	$309.37	$Expenses per Hour

Source: WMATA NTD, Form S-10 & F-30[19]

Additional Notes:

1. Vehicle revenue hours are the duration that a vehicle travels .

[19] Form S-10 is the NTD Service form. F-30 is the NTD Operating Expenses form.

3. Metrobus Financial Performance

As with Metrorail, WMATA aims to minimize Metrobus costs and deliver service as efficiently as possible. The following Metrobus financial performance measures are required by HB1539/SB856 (2018):

1. Farebox recovery
2. Metrobus service per rider
3. Cost per Metrobus service hour

The significance and meaning of these measures are summarized in each subsection below. NTD FY2017 data is reported for each measure.

3.1. Metrobus Farebox Recovery

Farebox recovery indicates how much of Metrobus operating costs are recovered through passenger fare revenues. This is an important financial measure to identify how effectively an agency funds its operating costs. A higher recovery ratio indicates that the transit agency recoups a larger share of its operating costs through passenger revenue. (Section 4 summarizes proposed strategies to reduce WMATA costs.)

Per Table 9, for FY2017, Metrobus farebox recovery was 20.4 percent.

Table 9: Metrobus Farebox Recovery (FY2017)

Financial Performance Metric	Calculation	Performance	Units
Farebox Recovery	$\frac{\text{Fare Revenue}}{\text{Operating Expenses}}$	20.4%	Revenue to Expense Ratio

Source: WMATA NTD, Form F-10 & F-30[20]

Additional Notes:

1. Farebox recovery is calculated by dividing the funds earned (fare revenue) by the total operating expenses (e.g. labor, services for operating and maintaining the transit system, general administration). Reference the Appendix for the official NTD definition.

3.2. Metrobus Service per Rider

Service per rider indicates the number of bus service hours offered per 10,000 passenger trips, summarizing how efficiently an agency is transporting passengers. A low service per rider

[20] Ibid

number indicates that relatively few hours of service are required to serve 10,000 passengers. Per Table 10, Metrobus service per rider was 320.73 hours per 10,000 trips in FY2017.

Table 10: Metrobus Service per Rider (FY2017)

Financial Performance Metric	Calculation	Performance	Units
Metrobus Service per Rider	$\frac{\text{Vehicle Revenue Hours}}{\text{Trips}} * 10{,}000$	320.73	Hours per 10,000 Trips

Source: WMATA NTD, Form S-10[21]

Additional Notes:

1. Vehicle revenue hours are the duration that a vehicle travels for revenue generation.
2. The factor of 10,000 in the calculation of service per rider is used for readability. Since service per rider is a relative metric, other scaling factors could be used.

3.3. Cost per Metrobus Service Hour

The cost per Metrobus service hour is the approximate cost associated with the operation and maintenance of a vehicle for each hour of revenue service. A lower number indicates a lower average hourly cost to operate each bus. Per Table 11, the cost per Metrobus service hour was $159.82 in FY2017.

Table 11: Cost per Metrobus Service Hour (FY2017)

Financial Performance Metric	Calculation	Performance, FY2017	Units
Cost per Metrobus Service Hour	$\frac{\text{Operating Expenses}}{\text{Vehicle Revenue Hours}}$	$159.82	$Expenses per Hour

Source: WMATA NTD, Form S-10 & F-30[22]

Additional Notes:

1. Vehicle revenue hours are the duration that a vehicle travels for revenue generation.

[21] Form S-10 is the NTD Service form.
[22] Form S-10 is the NTD Service form. F-30 is the NTD Operating Expenses form.

4. Strategies to Reduce the Growth in Costs and Improve Operational Efficiency

Funding for the Washington Metropolitan Area Transit Authority (WMATA) comes from several sources, but Virginia's financial obligation to WMATA rests primarily with the jurisdictions represented by the Northern Virginia Transportation Commission (NVTC). Although WMATA receives substantial operating and capital support from the Commonwealth of Virginia, the cities of Alexandria, Falls Church, and Fairfax and the counties of Arlington, Fairfax and, soon, Loudoun (just prior to the start of Silver Line Phase 2 operations) are legally obligated to fund WMATA capital and operating expenditures. These jurisdictions have a vested interest in limiting the growth in costs and improving the operational efficiency of WMATA.

Over the past several years – in resolutions, testimony, and newspaper op-eds – NVTC has urged WMATA to control its operating costs and improve the efficiency of its operations and offered strategies to accomplish both. In June 2017, NVTC endorsed[23] the direction of the WMATA General Manager's "Keeping Metro Safe, Reliable and Affordable" plan and supported WMATA's efforts to operate both within fiscal parameters and under policies and practices that assure high levels of safety and efficiency. To date, several recommendations have been implemented, such as imposing a 3 percent cap on annual operating and capital subsidy growth and supporting competitive contracting of targeted functions where permitted.

NVTC has embraced the opportunity afforded by Virginia's 2018 Omnibus Transit Funding Bill to share strategies that WMATA can use, building on efforts underway, to reduce costs and make its operations more efficient.

Section Overview

NVTC has identified strategies that, if implemented, could reduce the growth in WMATA's operating costs and improve its operational efficiency. In addition to crosscutting strategies, NVTC has organized these strategies in six categories:

1. Rebuild Rail and Bus Ridership
2. Enhance Efficiency of Metrobus and Metrorail Operations

[23] Northern Virginia Transportation Commission (NVTC). "NVTC Principles for WMATA Reform." September 7, 2018. <www.novatransit.org/uploads/LinkedDocs/2017/Resolution%202342%20NVTC%20Principles%20on%20WMATA%20Reform%20-%20As%20Amended%209-7-17.pdf>

3. Control Cost Escalation for Labor and Contracted Services
4. Optimize Revenue Collection
5. Increase Non-Fare Revenues
6. Enhance Efficiency of the Workforce and Contractors

These strategies, developed in coordination with jurisdictional and WMATA staff, include previously published NVTC priorities as well as efforts underway or planned for implementation under the "Keeping Metro Safe, Reliable and Affordable" plan and FY2019 budget. Short-term strategies could be implemented in one to three years. Long-term strategies may require legal, structural or legislative changes that could yield results in three or more years. It should be noted that while the WMATA Board of Directors and the General Manager have the authority to implement some strategies, several are outside their purview and will require changes in federal legislation and/or coordination among and between jurisdictions and WMATA.

Crosscutting Strategies

Crosscutting Strategies
• Align WMATA's business model to reflect shifts in urban/suburban mobility and define its role within the concept of mobility as a service • Encourage the development and use of innovation and technology within the WMATA workforce and contractor-provided services, in procurement actions, and operational processes

Changes in demographics and market conditions are influencing the role of public and private mobility providers. Nationwide, transit is in a period of transition, as ridership is declining or flat in many urban areas. Transit agencies are looking at innovative approaches, business models and uses of technology to adapt[24].

NVTC sees an opportunity to reexamine and better align WMATA's business model to reflect shifts in urban/suburban mobility and define its role within the concept of mobility as a service. Through efforts like the Washington Area Bus Transformation Project and implementation of a new approach to fare collection, WMATA has the opportunity to focus its operations to respond to changing travel behaviors.

NVTC also encourages the development and use of innovation and technology within the WMATA workforce and contractor-provided services, in procurement actions, and operational processes. New systems and processes – from workforce initiatives to targeted procurement efforts – may provide WMATA with the opportunity to improve efficiencies in its operations.

[24] Washington Metropolitan Area Transit Authority (WMATA). "Understanding Rail and Bus Ridership." October 12, 2017. <www.wmata.com/about/board/meetings/board-pdfs/upload/3A-Understanding-Ridership-TO-POST.pdf>

4.1. Rebuild Rail and Bus Ridership

Short Term	Long Term
• Implement new fare-pass products to promote more frequent rail and bus ridership and increase customer satisfaction* • Pursue partnerships with the business community to provide easier access to transit for employees and visitors*	• Pursue capital investments that increase the reliability of the system*

**Efforts underway by WMATA*

NVTC proposes that WMATA offer more flexible fare-payment options for Metrorail and Metrobus customers. A variety of fare payment options can ease the transit riding experience and help rebuild Metrorail and Metrobus ridership in the short term. NVTC's recent "Northern Virginia Regional Fare Collection Strategic Plan,"[25] developed with input from local transit systems, found broad agreement on the need for an upgraded and enhanced metropolitan Washington D.C. regional fare collection system, integrated with Metrorail and Metrobus, that can coexist with and be complemented by local solutions that meet each transit system's needs. Such an arrangement would promote the development and adoption of alternative payment methods and new pass products.

An example of promising transit fare products is SelectPass[26], a customizable and unlimited monthly pass that WMATA adopted in 2016. SelectPass has been well received and demonstrated positive impacts on ridership and revenue. Expanding the marketing and adoption of SelectPass fare products would increase revenues and the efficiency of the rail and bus systems. WMATA has several pass products that provide diverse payment options, both on a pay-as-you-go and subscription-based model. There are opportunities for WMATA to respond to customer demand and increase ridership by implementing new types of fare products that address unmet market demand and reduce barriers to transfers between bus and rail.

In 2016, more than 22.8 million people visited Washington, D.C., staying an average of 2.6 nights (domestic travelers) and six nights (international travelers)[27]. There are more than 35,000 hotel rooms in the District alone and the average daily rate for these hotels is more than $200 per night. Given the number of visitors who come to the D.C. region every year, WMATA should explore additional opportunities to partner with the hotel and convention industry to provide fare products directly to visitors as a part of hotel and/or convention registration.

[25] Northern Virginia Transportation Commission (NVTC). "Northern Virginia Regional Fare Collection Strategic Plan." 2018. <www.novatransit.org/uploads/Projects/Fare/NVTC%20Fare%20Collection%20Strategic%20Plan%20FINAL%202018-05-30.pdf>
[26] Washington Metropolitan Area Transit Authority (WMATA). "SelectPass: Pilot Performance and Tariff Update." December 1, 2016. <www.wmata.com/about/board/meetings/board-pdfs/upload/120116_3ASelectPassTOPOST.pdf>
[27] Destination DC (formerly the Washington, DC Convention & Tourism Corporation, or WCTC). "Washington, DC Visitation and Impact (2017)." <washington-org.s3.amazonaws.com/s3fs-public/2017_dc_visitation_and_impact_fact_sheet.pdf>

NVTC also sees opportunities for WMATA and Northern Virginia partners to expand WMATA's University Pass (U-Pass) program[28], which provides students of participating higher education institutions unlimited rides on Metrobus and Metrorail at a discounted price. The U-Pass program currently benefits several colleges and universities in the D.C. area, including Carnegie Mellon University Heinz College and more than 10,000 American University and Washington College of Law students. After a successful pilot program, the WMATA Board voted to formalize the program and expand to additional educational partners and interested regional transit providers[29].

In the long term, NVTC proposes that WMATA pursue capital investments to increase the system's reliability. WMATA's Capital Needs Inventory (2016)[30] found an unconstrained capital need of $25 billion[31]. Historically low levels of capital funding have impacted safety, reliability and compliance efforts and contributed to service disruptions and delays in the system. WMATA's adopted FY2019 Capital Budget[32] calls for $1.28 billion in capital investments, with safety and state of good repair as the largest segment. The recent adoption of $500 million per year of dedicated capital funding by the District of Columbia, Maryland and Virginia provides WMATA with an invaluable tool to achieve these capital goals. WMATA's sustained commitment to capital investments that help achieve and maintain a state of good repair will increase the reliability of the system and yield long-term dividends by rebuilding ridership.

4.2. Enhance Efficiency of Metrobus and Metrorail Operations

Short Term	Long Term
• Engage with jurisdictions to implement and explore pilot programs and other efforts to increase the reliability and speed of Metrobus operations* • Prioritize state of good repair investments that enhance Metrorail efficiency and reliability* • Conduct a comprehensive analysis of WMATA's bus network (Washington Area Bus Transformation Project) *	• Develop a fare system that can enable the region to implement an interoperable off-vehicle fare collection system on high capacity bus routes • Where appropriate, implement recommendations from the Washington Area Bus Transformation Project Study

**Efforts underway by WMATA*

[28] Washington Metropolitan Area Transit Authority (WMATA). "U-Pass Program." <www.wmata.com/fares/U-Pass/>
[29] Washington Metropolitan Area Transit Authority (WMATA). "University Pass (U·Pass) Pilot Program." April 20, 2018. <www.wmata.com/about/board/meetings/board-pdfs/upload/11A-FIN-UPass-Adoption.pdf>
[30] Washington Metropolitan Area Transit Authority (WMATA). "10-Year Capital Needs: Inventory and Prioritization CY 2017-2026 Needs." November 2016. <www.wmata.com/initiatives/plans/upload/CNI-full-report-and-appendices.pdf>
[31] Washington Metropolitan Area Transit Authority (WMATA). "Keeping Metro Safe, Reliable and Affordable." September 14, 2017. <www.wmata.com/about/board/meetings/board-pdfs/upload/3B-KMSRA-Final-09-13-TO-POST.pdf>
[32] Washington Metropolitan Area Transit Authority (WMATA). "FY2019 Approved Budget." July 1, 2018. <www.wmata.com/about/records/public_docs/upload/FY2019-Approved-BudgetFinal.pdf>

The Washington, D.C. region relies on an integrated transportation network that includes a network of bus systems, including Metrobus. Metrobus provides more than 400,000 trips each weekday serving 11,500 bus stops in D.C., Maryland and Virginia. Metrobus is the sixth busiest bus service in the U.S., with a fleet of more than 1,500 buses operating on 325 routes.[33]

In the short term, NVTC sees the potential for WMATA to increase the speed and reliability of bus operations, which would increase ridership and reduce operating costs. WMATA's 2018 cash-free pilot[34] on its MetroExtra Route 79 will provide data to help evaluate whether cash-free service should be extended to other limited stop routes, including three in Virginia. Loading cash onto a SmarTrip® fare card or paying with cash on the bus takes at least 10 seconds per person, which significantly slows progress. WMATA is exploring whether to make the cash-free pilot permanent and extend it to additional limited-stop Metrobus routes.[35]

Metrorail is a vital mobility option and supports economic growth and development across the entire region. In recent years, WMATA has modified Metrorail service to provide additional time for track and system maintenance and has prioritized state of good repair investments that directly impact the efficiency of rail service.

Both the General Manager's plan – "Keeping Metro Safe, Reliable, and Affordable"[36]— and the 2017 report by former U.S. Secretary of Transportation Ray LaHood[37] identified recommendations to reexamine or rethink the region's approach to Metrobus. WMATA recently initiated an effort to develop a regional bus strategy and roadmap. The Washington Area Bus Transformation Project[38] seeks to identify how to improve service, provide a better customer experience for bus riders, determine the best role for bus service amid rapidly changing technologies and travel preferences, and increase efficiency to provide better results for customers despite limited resources.

During a year-long effort, the Washington Area Bus Transformation Project team will engage with stakeholders from the public and private sectors across the region to explore all factors that influence the quality of bus service, including costs, advancing technology, governance structures, regional coordination and communication, service operations, funding sources, and the role of different providers.

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[33] Washington Metropolitan Area Transit Authority (WMATA). "About Metrobus." <www.wmata.com/service/bus/>
[34] Washington Metropolitan Area Transit Authority (WMATA). "Cash Free Bus Pilot." May 24, 2018. <www.wmata.com/about/board/meetings/board-pdfs/upload/10B-SSD-Cash-Free-Bus-Pilot-FINALIZED.pdf>
[35] Washington Metropolitan Area Transit Authority (WMATA). "Metro Considers Expanding Cash-Free Boarding on Limited-Stop Routes, Seeks Public Input." September 6, 2018. <www.wmata.com/about/news/Metro-considers-expanding-cash-free-boarding-on-limited-stop-routes.cfm>
[36] WMATA. "Keeping Metro Safe, Reliable and Affordable." September 14, 2017.
[37] Department of Rail and Public Transportation (DRPT). "Review of Operating, Governance and Financial Conditions at the Washington Metropolitan Area Transit Authority." 2017. <www.drpt.virginia.gov/media/2320/full-report.pdf>
[38] Washington Area Bus Transformation Project. "About." Accessed on September 11, 2018. <https://bustransformationproject.com/about/#description>

The project will develop a set of draft strategies with recommendations and an implementation plan by 2019. NVTC staff are engaged in two of the project's stakeholder committees and will be involved throughout the life of the project. NVTC will examine the resulting strategies for consideration in future reports to the General Assembly and Governor.

NVTC also supports the development and implementation of a regional interoperable off-vehicle fare collection system on high-capacity bus routes as a long-term strategy. WMATA operates SmarTrip®, a regional system that supports fare payment on buses. In 2018, WMATA announced a modernization initiative[39] that includes the development of an application that would enable mobile phones to function as SmarTrip® cards. As articulated in NVTC's "Northern Virginia Regional Fare Collection Strategic Plan,"[40] a new system should support off-vehicle fare payment and onboard ticket inspection and provide solutions for all-door boarding for transit systems to minimize the time passengers spend getting on the bus. Speeding up the boarding process can shorten passenger travel time, increase ridership, and reduce operating costs[41].

4.3. Control Cost Escalation for Labor and Contracted Services

Short Term	Long Term
• Provide greater authority to the WMATA General Manager and Board of Directors to make operational decisions that improve the system's cost effectiveness, without jeopardizing safety. This should include tools such as competitive contracting of targeted functions*	• Include the 3 percent cap on annual operating subsidies as a mandatory factor in establishing labor costs through collective bargaining of subsequent arbitration • Amend the federal Wolf Act to require arbitrators in WMATA contract mediations to consider these fiscal restrictions in all cases • Identify and evaluate options to address unfunded OPEB liabilities

**Efforts underway by WMATA*

Labor expenses comprise about 70 percent of WMATA's total operating expenses. According to WMATA's General Manager, labor and benefit costs are growing at 1.5 and 2.5 times the rate of revenue[42], respectively. WMATA will need to address its $1.01 billion unfunded pension liability[43] and $1.8 billion unfunded Other Post-Employment Benefits (OPEB) liability[44], which

[39] Washington Metropolitan Area Transit Authority (WMATA). "Fare Collection Modernization Program Update." April 12, 2018. <www.wmata.com/about/board/meetings/board-pdfs/upload/4A-Fare-Collection-Modernization-Update.pdf>
[40] NVTC. "Northern Virginia Regional Fare Collection Strategic Plan." May 2018.
[41] WMATA. "Cash Free Bus Pilot." May 24, 2018.
[42] WMATA. "Keeping Metro Safe, Reliable and Affordable." September 14, 2017.
[43] Washington Metropolitan Area Transit Authority (WMATA). "Review Plan Actuarial Reports and Performance." November 2, 2017. <www.wmata.com/about/board/meetings/board-pdfs/upload/3A-Pension-Plan-Performance-Reports-Corr.pdf>
[44] Washington Metropolitan Area Transit Authority (WMATA). "Other Post-Employment Benefits (OPEB) Update." April 12, 2018. <www.wmata.com/about/board/meetings/board-pdfs/upload/4A-OPEB-Update.pdf>

includes non-pension costs for retiree medical and prescription drug coverage, and life insurance.

A recent U.S. Government Accountability Office (GAO) study found that, "The Washington Metropolitan Area Transit Authority's (WMATA) workforce costs—including wages, salaries, and benefits for employees and retirees—increased on average by about 3 percent annually from fiscal years 2006 through 2017. This increase was largely driven by the cost of employee and retiree benefits. Specifically, the amount WMATA was required to contribute to its pension plans increased by an annual average of about 19 percent during this period. Due to their relative size, proportion of retirees compared to active members, and investment decisions, these pension plans pose significant risk to WMATA's financial operations, yet WMATA has not fully assessed the risks."[45]

WMATA has provided the GAO with a recently completed, comprehensive assessment of financial risks posed by its pension plans. WMATA also noted that additional work is needed with the board and jurisdictions to achieve a long-term solution. In addition, two of WMATA's unions (Local 639 and Local 2) and non-represented staff have already moved to defined contribution retirement plans for new employees. In March 2017, the WMATA Board established an OPEB Trust that will be funded with savings achieved through successful controls on absenteeism, overtime and workers' compensation, and other sources as available.

Given the Virginia jurisdictions' responsibility to meet their share of these financial obligations, NVTC is keenly interested in identifying ways to control labor costs. As such, NVTC adopted its Principles for WMATA Reform[46] in September 2017 that included specific strategies for WMATA to control labor costs. NVTC's principles included:

- In labor negotiations, the WMATA General Manager and Board of Directors should have greater authority to make operational decisions that improve the system's cost effectiveness without jeopardizing safety, including the use of tools such as competitive contracting of targeted functions.
- WMATA's annual operational cost increases should adhere to the 3 percent annual cap recommended by the General Manager in his April 2017 "Keeping Metro Safe, Reliable and Affordable" plan. The ability to maintain such funding discipline should be a mandatory in establishing labor costs through collective bargaining or arbitration.
- NVTC endorses an amendment to the National Capital Area Interest Arbitration Standards Act of 1995, Pub L. 104-50, as recommended by the General Manager in his "Keeping Metro Safe, Reliable and Affordable" plan that would require arbitrators in WMATA contract mediations to consider these fiscal restrictions in all cases.

[45] Government Accountability Office (GAO). "Washington Metropolitan Area Transit Authority | Assessing Fiscal Risks and Improving Workforce Management Would Help Achieve Strategic Goals." September 2018. <www.gao.gov/assets/700/694418.pdf>

[46] NVTC. "NVTC Principles for WMATA Reform." September 7, 2017.

- NVTC calls upon the WMATA General Manager and Board of Directors to identify a specific plan to address the agency's unfunded pension liability and other post-employment benefits.

NVTC supports WMATA's initiatives to improve cost effectiveness without jeopardizing safety. Such measures include WMATA's contract for the maintenance and operation of buses from its new Cinder Bed Road bus facility[47] in Lorton, Virginia, which is expected to limit cost growth while delivering quality service and preserving current employees' jobs. Silver Line Phase 2 also offers a contracting opportunity[48]. Both initiatives are central to WMATA's strategy to manage long-term pension costs.

4.4. Optimize Revenue Collection

Short Term	Long Term
• Implement efforts on bus and rail to decrease fare evasion*	• Develop the next generation of fare collection technology

**Efforts underway by WMATA*

Fare evasion creates safety and customer service concern as well as a direct and indirect loss of revenue, the latter by impacting federal funding formulas. In the Metrorail system, the use of swing gates is the primary way that riders avoid paying fares. In 2017, WMATA conducted a pilot at Fort Totten and Gallery Place Metrorail stations to test new swing gate configurations that stop their use except in the event of an emergency. Results of the pilot found that at the affected stations there was a 2.3 percent net increase in weekday ridership. Using lessons learned from the pilot, WMATA began the installation of secure swing gates in all Metrorail stations in the summer of 2018[49].

Major elements of WMATA's fare collection technology have reached or exceeded their useful life. As articulated in NVTC's "Northern Virginia Regional Fare Collection Strategic Plan,"[50] there is a need for a long-term plan for a regional system that can enhance the customer experience and transit system efficiencies. A next generation system would allow greater innovation and flexibility in payment types and platforms, regional interoperability, fare products, and payment across modes. This would reduce costs and improve efficiency by optimizing revenue collection,

[47] Washington Metropolitan Area Transit Authority (WMATA). "In Move to Control Costs, Metro Awards Contract for New Bus Facility in Virginia." August 2, 2018. <www.wmata.com/about/news/cinder-bed-contract.cfm>
[48] Washington Metropolitan Area Transit Authority (WMATA). "Metro Announces Contracting Opportunity for Silver Line Extension in Effort to Control Future Expense Growth." September 18, 2018. <www.wmata.com/about/news/Silver-Line-Contracting-Opportunity-Release.cfm>
[49] Washington Metropolitan Area Transit Authority (WMATA). "Fair Share Initiative Update." April 12, 2018. <www.wmata.com/about/board/meetings/board-pdfs/upload/3A-Fair-Share-Update.pdf>
[50] NVTC. "Northern Virginia Regional Fare Collection Strategic Plan." May 2018.

reducing the need for physical in-station fare collection infrastructure and removing barriers related to fare collection that can attract new riders.

4.5. Increase Non-Fare Revenues

Short Term	Long Term
• Leverage value for assets WMATA owns by maximizing advertising revenues and optimizing parking revenues* • Explore non-traditional revenue streams to optimize value of Metrorail facilities*	• Pursue joint development opportunities on underutilized assets* • Pursue a real estate strategy that generates operating efficiencies*

**Efforts underway by WMATA*

NVTC supports initiatives and efforts by WMATA to increase and optimize its non-fare revenues. In its FY2019 Operating Budget[51], WMATA included advertising revenues totaling $26 million or 1.4 percent of operating revenues. In 2015, WMATA initiated the use of digital advertising in stations and expanded it in 2016 and 2017. By replacing static displays with digital panes, multiple advertisers can purchase time on a single display, increasing the revenue potential from advertising in the stations[52]. Train wraps and station domination, where an advertiser blankets the advertising in one station, are recent advertising initiatives WMATA is pursuing to generate revenue.

With its 28 garages, 30 surface parking lots and 44 kiss-and-ride lots, totaling over 61,000 parking spaces, parking is a key component of WMATA's ability to attract automobile drivers to use Metrorail. NVTC supports initiatives to optimize parking revenue through policies that increase parking utilization and generate revenues from nonriders while increasing transit ridership. In 2017, WMATA authorized parking pilot programs,[53] followed by changes in 2018. These pilot programs are being evaluated and considered for permanent adoption[54].

Joint development, where private real estate developments co-locate with transit services, increases demand for transit and generates additional non-fare revenue for WMATA. WMATA has an active joint development program and more than 30 such projects have been completed

[51] WMATA. "FY2019 Approved Budget." p. 26. July 1, 2018.
[52] Washington Metropolitan Area Transit Authority (WMATA). "Revenue Opportunities: Digital Advertising and Station Naming Rights." July 13, 2017. <www.wmata.com/about/board/meetings/board-pdfs/upload/4C-Revenue-Opportunities-Digital-Ads-Station-Names.pdf>
[53] Washington Metropolitan Area Transit Authority (WMATA). "Parking Revenue Enhancements." July 13, 2017. <www.wmata.com/about/board/meetings/board-pdfs/upload/3B-Parking-Rev-Enancements-Rev-07-11-v2-TO-POST.pdf>
[54] Washington Metropolitan Area Transit Authority (WMATA). "Approval of Parking Pilot Title VI Analysis and Authorization of Public Hearing for Parking Programs." July 12, 2018. <www.wmata.com/about/board/meetings/board-pdfs/upload/9B-Parking-Programs-FINALIZED.pdf>

since 1975. Its recently updated joint development guidelines[55] provide more flexibility in program management. NVTC sees continued long-term opportunities for WMATA to increase non-fare revenues by pursuing joint development on underutilized assets.

WMATA owns real estate across the region in urban, suburban and industrial locations. Given the recent passage of dedicated capital funding and a 3 percent cap on operating subsidy increases, NVTC sees opportunities for strategically placing the locations of WMATA facilities in a manner that will enhance land use value and reduce operating costs. WMATA is implementing an office consolidation strategy that will reduce the number of facilities it leases or owns from 10 to seven[56].

4.6. Enhance Efficiency of the Workforce and Contractors

Short Term	Long Term
• Adequately fund WMATA's Office of the Inspector General • Improve productivity through strengthened management of employee absenteeism and overtime* • Improve management of use of workers' compensation*	• Continue to enhance workforce productivity through human resource policies* • Incentivize the workforce and contractors to deliver innovative solutions

**Efforts underway by WMATA*

NVTC supports efforts to adequately fund WMATA's Office of the Inspector General (OIG) to ensure it is sufficiently resourced to conduct its mission. The OIG, which reports directly to the WMATA Board, conducts independent and objective audits, evaluations, investigations and reviews of WMATA programs and operations to promote efficiency and effectiveness while preventing fraud, waste and abuse[57]. The OIG advises the WMATA Board and General Manager in order to achieve the highest levels of program and operational performance.

NVTC supports WMATA's initiatives to minimize absenteeism and the use of overtime. In 2017 the WMATA General Manager introduced new controls on absenteeism[58] to improve productivity and reduce the use of overtime. These efforts targeted excessive absenteeism through rigorous monitoring and compliance with existing policies and agreements. These controls included tighter management of unexcused absences and sick leave, improvements in

[55] Washington Metropolitan Area Transit Authority (WMATA). "Update to Metro's Joint Development Policies." April 12, 2018. <www.wmata.com/about/board/meetings/board-pdfs/upload/3A-Joint-Development-Policies.pdf>
[56] Washington Metropolitan Area Transit Authority (WMATA). "Office Consolidation." July 12, 2018. <www.wmata.com/about/board/meetings/board-pdfs/upload/9C-Office-Consolidation-FINALIZED.pdf>
[57] WMATA. "FY2019 Approved Budget." p. 53. July 1, 2018.
[58] Washington Metropolitan Area Transit Authority (WMATA). "Metro GM Further Increases Accountability with New Controls on Absenteeism." February 17, 2017. <www.wmata.com/about/news/gm-absenteeism-policy.cfm>

reviews of time and payroll verifications, and improved management of the use of worker compensation. Between January and April 2018, savings from absenteeism, worker's compensation, and overtime controls resulted in over $3 million in savings[59]. Through savings from these controls, WMATA has established an "Other Post-Employment Benefit" Trust to pre-fund OPEB liabilities.

The GAO recently published a study that reviewed WMATA's workforce management with a focus on the sustainability of costs and performance management practices. Specifically, it found that "WMATA has implemented two employee performance management systems that cover all employees, but these systems lack some key elements of an effectively designed and implemented performance management system."[60] The GAO recommends that WMATA "develop comprehensive policies and procedures for its employee performance management systems, and controls to ensure supervisors complete required performance evaluations." WMATA notified the GAO that it has initiated procurement of consultant support to evaluate and redesign, as needed, WMATA's current performance management program for all employee groups to develop guidance on best practices, policies and procedures, and to examine the use of technology. WMATA's goal is to begin consultant supported work in July 2019.

In realigning WMATA's business model and enhancing employee performance management, NVTC sees a long-term potential to reduce the growth in costs and improve operational efficiency. Supporting innovation, the strategic use of technology within the workforce and contracted services and incentivizing the workforce will yield innovative solutions.

[59]WMATA. "Other Post-Employment Benefits (OPEB) Update." April 12, 2018.
[60] GAO. "Washington Metropolitan Area Transit Authority | Assessing Fiscal Risks and Improving Workforce Management Would Help Achieve Strategic Goals." September 2018.

5. Use of Dedicated Capital Funds

HB1539/SB856 (2018) authorized the Washington Metropolitan Area Transit Authority Capital Fund (WMATA Capital Fund) to fund Virginia's portion of WMATA's dedicated capital funding. The legislation required that, in each year that revenues are deposited into the fund, NVTC shall include in this report the use of funds from the WMATA Capital Fund during the prior year.

The Virginia legislation became effective on July 1, 2018 and the Commonwealth authorized the use of $121.3 million in revenues to be disbursed to WMATA in FY2019 from the WMATA Capital Fund[61]. Because of the timing of this initial report, no expenditures were incurred during this reporting period. NVTC will provide information on the use of these funds in the future.

The Commonwealth's WMATA Capital Fund will support WMATA's investments in safety, system preservation, and state of good repair of its rail transportation system and bus network. WMATA's FY2019-2024 Capital Improvement Plan (CIP), part of the agency's FY2019 budget, provides details on the sources and uses of funds. Safety and state of good repair comprise the largest section of the capital budget. They include recurring annual investments in the replacement, rehabilitation and maintenance of existing assets to ensure the safety of WMATA's core infrastructure and to promote a state of good repair. In the future, WMATA will provide NVTC with the information necessary to report on the use of funds from the Commonwealth's WMATA Capital Fund.

[61] The Department of Rail and Public Transportation sent a letter on June 7, 2018 informing WMATA of the Commonwealth of Virginia's authorization of the use of funds from the "Washington Metropolitan Area Transit Authority Capital Fund."

6. Metrorail & Metrobus Ridership

Because public transit services exist to transport passengers, transit systems seek to maximize patronage, measured in passengers. This section summarizes Metrorail and Metrobus ridership, which is measured by the NTD using:

1. Unlinked Passenger Trips (UPT)
2. Passenger Miles Traveled (PMT)

The meaning and significance of these two ridership measures are clarified in Sections 5 and 6.2. Data is reported for FY2017.

6.1. Unlinked Passenger Trips

Unlinked passenger trips (UPT) indicates the number of passengers boarding vehicles. UPT demonstrates the overall number of passengers passing through the overall Metro system. A higher UPT reflects greater use of transit services. This section provides FY2017 UPT data for Metrorail and Metrobus.

6.1.1. Metrorail Unlinked Passenger Trips

In FY2017, total ridership for Metrorail was 227,053,037 unlinked passenger trips, as shown in Table 12. The official NTD definition for this ridership metric is included in the Appendix.

Table 12: Metrorail Ridership, UPT (FY2017)

Ridership Metric	Total Trips	Units
Unlinked Passenger Trips	227,053,037	Trips[62]

Source: WMATA NTD, Form S-10[63]

Additional Notes:

1. NTD reports ridership using the UPT metric, which reflects the number of passenger boardings. The trip of a passenger who boards two separate Metro trains, transferring from one Metrorail line onto a different line, would be counted as two UPTs.
2. Metrorail directly records and publishes linked passenger trips, which are adjusted to UPT using a statistical method based on a passenger survey[64]. A linked passenger trip may include boarding two or more trains. This statistical adjustment from linked

[62] See 'Unlinked Passenger Trips' in 8.1 Definitions.
[63] Form S-10 is the NTD Service form.
[64] National Transit Database, "National Transit Database Sampling Manual." March 31, 2009. <www.transit.dot.gov/sites/fta.dot.gov/files/docs/The_NTD_Sampling_Manual.pdf>

passenger trips to unlinked passenger trips implies that NTD Metrorail ridership figures for FY2017 will not match those in the Metro Performance Report (MPR).

6.1.2. Metrobus Unlinked Passenger Trips

In FY2017, total ridership for Metrobus was 123,124,352 unlinked trips, as shown in Table 13.

Table 13: Metrobus Ridership, UPT (FY2017)

Ridership Metric	Total Trips	Units
Unlinked Passenger Trips	123,124,352	Trips[65]

Source: NTD, Form S-10[66]

Additional Notes:

1. The NTD reports unlinked passenger trips (UPT), which is the number of passenger boardings. Metrobus directly records bus passenger boardings.

6.2. Passenger Miles Traveled

Passenger miles traveled (PMT) indicates the total sum of miles traveled by all passengers aboard the transit service. A single passenger traveling 10 miles by bus would count as 10 passenger miles traveled. As with UPT, a higher PMT figure indicates greater patronage of transit services, providing insight into both UPT and distances traveled by passengers.

6.2.1. Metrorail Passenger Miles Traveled

In FY2017, the total passenger miles traveled for Metrorail was 1,326,262,650, as shown in Table 14.

Table 14: Metrorail Ridership, PMT (FY2017)

Ridership Metric	Total Miles	Units
Passenger Miles Traveled	1,326,262,650	Miles

Source: WMATA NTD, Form S-10[67]

6.2.2. Metrobus Passenger Miles Traveled

In FY2017, total passenger miles traveled for Metrobus was 369,020,804, as shown in Table 15.

[65] See 'Unlinked Passenger Trips' in 8.1 Definitions.
[66] Form S-10 is the NTD Service form.
[67] Ibid

Table 15: Metrobus Ridership, PMT (FY2017)

Ridership Metric	Total Miles	Units
Passenger Miles Traveled	369,020,804	Miles

Source: WMATA NTD, Form S-10[68]

7. Conclusion

This report summarizes safety, operating, financial and ridership information on the state of WMATA's rail and bus systems, responding to the mandate of HB1539/SB856 (2018).

In addition, this report summarizes cost control and operational improvement strategies proposed by NVTC to improve the efficiency of WMATA's rail and bus systems.

In the future, WMATA will provide NVTC with the information necessary to report on the use of funds from the Commonwealth's WMATA Capital Fund.

[68] Ibid

8. Appendix

This appendix includes definitions and sources for the terminology used throughout the report.

8.1. Definitions

To provide a holistic picture of WMATA's safety, reliability, financial and ridership performance, the definitions below have been aggregated from the following sources as indicated in the footnotes:

1. When not indicated otherwise, definitions are taken directly from the NTD Glossary[69].
2. For metrics without a NTD definition, a definition is taken from WMATA's FY2018 Metro Performance Report (MPR)[70]. MPR definitions also include an explanation of what each metric mean[s] and why it is important to [their] strategy. These explanations are included along with the definitions.
3. To build a complete understanding of each MPR definition, WMATA provided NVTC with clarifications, which are denoted with the footnote "Provided by WMATA."

C

Collision

A vehicle/vessel accident in which there is an impact of a transit vehicle/vessel with: another transit vehicle, a non-transit vehicle, a fixed object, a person(s) (suicide/attempted suicide included), an animal, a rail vehicle, a vessel, or a dock.

Cost per Service Hour[71]

The average cost to operate one vehicle/passenger car for one hour of passenger service.

D

Deadhead

The miles and hours that a vehicle travels when out of revenue service. Deadhead includes:

1. Leaving or returning to the garage or yard facility
2. Changing routes
3. When there is no expectation of carrying revenue passengers

[69] FTA. "National Transit Database (NTD) Glossary." April 12, 2018

[70] WMATA. "Metro Performance Report." Fiscal Year 2018.

[71] Federal Transit Administration (FTA). "2015 Metrics." <www.transit.dot.gov/ntd/data-product/2015-metrics>

Deadhead does not include:

1. Charter service
2. Operator training
3. Maintenance training

Derailments
Non-collision incidents in which one or more wheels of a vehicle unintentionally leaves the rails.

F

Farebox Recovery Ratio[72]
The portion of operating expenses that are paid for by fare revenues. This metric is calculated as: *Fare Revenue ÷ Operating Expenses*.

Fare Revenue
All income directly earned from carrying passengers, paid either in cash or through pre-paid tickets, passes, etc. It includes donations from those passengers who donate money on the vehicle, reduced fares paid by passengers in a user-side subsidy arrangement, or payments made through an agreement to provide fare-free service for a certain group, e.g. payments from a university to provide free service to students. It also includes base fare, zone or distance premiums, express service premiums, extra cost transfers, and special transit fares.

Fatality
A death or suicide confirmed within 30 days of a reported incident. Does not include deaths in or on transit property that are a result of illness or other natural causes.

Fire
Uncontrolled combustion made evident by flame that requires suppression by equipment or personnel.

Failure, Metrobus[73]
WMATA counts as failures those buses with interrupted trips due to mechanical problems that resulted in lost trips. Therefore, only bus maintenance chargeables (BMCs) are counted.

- Major failures are BMCs that may leave the bus stranded on the street or result in grossly unsafe operation. Examples: brakes, door interlock, generator, smoke/fire, large fluid leaks, engine or transmission shutdown, broken wipers on rainy days. ("Accidents" caused by mechanical failure (i.e. brakes not engaging) are counted as major.)

[72] Instead of farebox recovery ratio, the Federal Transit Administration (FTA) uses the term 'recovery ratio' per the FTA 2015 Metrics: www.transit.dot.gov/ntd/data-product/2015-metrics. This definition is adapted from the FTA Metrics list.
[73] Provided by WMATA.

- Minor failures are BMCs that may be deemed unsafe by the operator, manufacturer, or engineers to protect the bus from irreparable damage. Examples: engine/transmission malfunction indicators, windshield, mirrors, unsafe interior or exterior body issues.

Failure, Metrorail[74]
WMATA defines a railcar failure as a mechanical failure that requires corrective maintenance. Failures related to operator error or customer behavior, e.g. doors that fail because they were held open by customers, are not counted. Not all failures prevent vehicles from completing scheduled revenue trips or starting the next scheduled revenue trips. In some cases, corrective maintenance can be conducted after the scheduled trips are completed.

Fringe Benefits
The payments or accruals to others (insurance companies, governments, etc.) on behalf of an employee and payments and accruals directly to an employee arising from something other than a piece of work. These payments are transit agency costs over and above labor costs, but still arising from the employment relationship. It does not include other post-employment benefits (OPEB) recorded under GASB-45.

H

Headway
The time interval between vehicles moving in the same direction on a route.

I

Injury
Any damage or harm to persons as a result of an event that requires immediate medical attention away from the scene.

L

Linked Passenger Trips[75]
A linked passenger trip is counted when a customer enters through a faregate. In an example where a customer transfers between two trains to complete their travel one trip is counted. Metrorail reports linked passenger trips.

[74] Ibid
[75] WMATA. "Metro Performance Report." Fiscal Year 2018.

Labor (Cost)[76]
The pay and allowances due employees in exchange for the labor they provide on behalf of the transit agency. The labor allowances include payments made directly to the employee arising from the performance of a piece of work.

M

Major Event Report (S&S-40)[77]
The Major Event Report (S&S-40) captures detailed information on severe safety and security events that occur within a transit environment. Agencies must complete one S&S-40 per reportable event, regardless of how many thresholds an event meets.

A reportable event is one that meets any NTD reporting threshold (detailed below) and occurs:

- On transit right-of-way or infrastructure;
- At a transit revenue facility;
- At a maintenance facility or rail yard;
- During a transit-related maintenance activity, or
- Involves a transit revenue vehicle.

Mean Distance between Delays[78]
The average number of miles traveled before a railcar experiences a failure that leads to a delay of four or more minutes[79]. This is equivalently expressed as: *Total railcar revenue miles ÷ Number of failures during revenue service resulting in delays of four or more minutes*.

Some car failures result in inconvenience or discomfort but do not always result in a delay of service, such as hot cars. Mean distance between delays includes those failures that had an impact on customer on-time performance.

Mean Distance between Failures[80]
The average number of miles traveled before a mechanical breakdown requiring the bus to be removed from service or deviate from the schedule. This can also be expressed as: *Total revenue miles ÷ Total number of failures*[81].

[76] The NTD uses 'labor' as the metric for labor cost.
[77] Adapted from: National Transit Database. "NTD Safety & Security Reporting Manual." pp. 21-35. 2018. <www.transit.dot.gov/sites/fta.dot.gov/files/docs/ntd/69096/2018-safety-and-security-policy-manual.pdf>
[78] WMATA. "Metro Performance Report." p. 44. Fiscal Year 2018.
[79] See 'Failure, Metrorail' in 8.1 Definitions.
[80] WMATA. "Metro Performance Report." p. 44. Fiscal Year 2018.
[81] See 'Failure, Metrobus' in 8.1 Definitions.

Mean distance between failures is used to monitor trends in vehicle breakdowns that cause buses to go out of service and to plan corrective actions. Factors that influence fleet reliability include vehicle age, quality of maintenance program, original vehicle quality, and road conditions affected by inclement weather and road construction.

N

Non-Labor Costs

The costs associated with operating expenses less labor cost[82], including:

1. Fuel/Lube
2. Tires/Tubes
3. Other Materials/Supplies
4. Utilities
5. Casualty/Liability Costs
6. Taxes

O

On-Time Performance (Metrobus), *"adherence to schedule"*[83]

On-time performance is calculated through: *Number of time points[84] that arrived on time by route based on a window of 2 minutes early and 7 minutes late ÷ Total number of time points delivered (by route).*

This indicator summarizes how closely Metrobus adheres to published route schedules on a system-wide basis. Factors that influence on-time performance are traffic congestion, inclement weather, scheduling, vehicle reliability, and operational behavior.

On-Time Performance (Metrorail)[85]

On-time performance is calculated differently for peak and off-peak:

- Peak: *Number of station stops delivered within the scheduled headway plus two minutes during rush (AM/PM) service ÷ Total station stops delivered*

[82] Categories under Operating Expenses are based on NTD Definition. Federal Transit Administration. "National Transit Database: Policy Manual." January 2017. <www.transit.dot.gov/sites/fta.dot.gov/files/docs/ntd/57981/2017-ntd-policy-manual_2.pdf>

[83] WMATA uses 'adherence to schedule' to describe Metrobus on-time performance. Washington Metropolitan Area Transit Authority. "Metro Performance Report." p. 19. Fiscal Year 2018. <www.wmata.com/about/records/scorecard/upload/FY18-Metro-Performance-Report.pdf>

[84] See 'Time Point' in 8.1 Definitions.

[85] WMATA. "Metro Performance Report." p. 18. Fiscal Year 2018.

- Off-peak: *Number of station stops delivered up to 150 percent of the scheduled headway during non-rush (midday and evening) ÷ Total station stops delivered*

The calculation combining both time periods[86] is calculated as:
(Number of peak station stops delivered on-time + Number of off-peak station stops delivered on-time) ÷ (Total number of station stops)

The peak and off-peak hours are:

1. **Peak periods**: AM rush (approximately 6-9:30 a.m.) and PM rush (approximately 3:15-6:30 p.m.)
2. **Off-peak periods**: Midday (approximately 9:45 a.m.-3 p.m.) and Night (approximately 6:45 p.m. to close)

Station stops are tracked system-wide, except for terminal and turn-back stations. The train is said to be "on time" if it arrives at the station stop within the headway + two minutes' time window during rush (AM/PM) or 150 percent of the headway during the non-rush (Midday/Night).

The exact times vary by station and align with the time when scheduled headways even out. On-time performance is not measured during ramp up and ramp down periods, when Metro transitions between rush and non-rush service periods, due to variable headways.
Train on-time performance measures the adherence to weekday headways or the time customers wait between trains. Factors that can influence on-time performance include: infrastructure conditions, missed dispatches, railcar delays, e.g. doors, or delays caused by sick passengers. Station stops are tracked system-wide, with the exception of terminal and turn-back stations.

Operating Expenses
These expenses include labor and non-labor costs, and services for operating and maintaining the mode, including general administration costs. Labor costs are fully loaded, meaning they include fringe benefit costs (directly paid to employees as well as indirectly, e.g. payments to pension funds) in addition to wages and salary costs.[87]

P

Passenger Miles Traveled (PMT)[88]
The cumulative sum of the distances ridden by each passenger.

[86] Provided by WMATA.
[87] National Transit Database. "TS2.1 - Service Data and Operating Expenses Time-Series by Mode." 2016. <www.transit.dot.gov/ntd/data-product/ts21-service-data-and-operating-expenses-time-series-mode-0>
[88] The NTD refers to Passenger Miles Traveled as 'Passenger Miles.'

R

Revenue Service (Hours)
The time when a vehicle is available to the public and there is an expectation of carrying passengers. These passengers either:

1. Directly pay fares
2. Are subsidized by public policy
3. Provide payment through some contractual arrangement

Vehicles operated in fare-free service are considered in revenue service. Revenue service includes:

1. Layover/recovery time

Revenue service excludes:

1. Deadhead[89]
2. Vehicle maintenance testing
3. School bus service
4. Charter Service

S

Security Event
An occurrence of a bomb threat, bombing, arson, hijacking, sabotage, cyber security event, assault, robbery, rape, burglary, suicide, attempted suicide (not involving a transit vehicle), larceny, theft, vandalism, homicide, CBR (chemical/biological/radiological) or nuclear release, or other event.

Service per Rider[90]
A performance metric that measures the ratio of vehicle revenue hours to unlinked passenger trips. Note that in this report, this ratio is scaled by a factor of 10,000 for readability.

T

Time Point
A time point is an exact "point in time" at which Metro service is provided. Time points can be anywhere along the route, including an intersection. Adherence to schedule is measured as the

[89] See 'Deadhead' in 8.1 Definitions.
[90] Department of Rail and Public Transportation (DRPT). "Review of WMATA Operating, Governance and Financial Conditions." March 2018. <www.drpt.virginia.gov/media/2320/full-report.pdf>

bus leaves each time point except the last for each run. Time point is used in the definition of on-time performance for Metrobus.

U

Unlinked Passenger Trips (UPT)
The number of passengers who board public transportation vehicles. Passengers are counted each time they board vehicles no matter how many vehicles they use to travel from their origin to their destination. Metrobus reports unlinked passenger boardings.

V

Vehicle Revenue Hours
The hours that a vehicle actually travels from the time it pulls out of its garage to enter passenger service to the time it returns. Vehicle revenue hours are often called platform time.

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