NVTC
NORTHERN VIRGINIA TRANSPORTATION COMMISSION

2021 Report on the Performance & Condition of the Washington Metropolitan Area Transit Authority

Submitted to
the Governor and
General Assembly
December 2021

NORTHERN VIRGINIA TRANSPORTATION COMMISSION

December 15, 2021

On behalf of the Northern Virginia Transportation Commission (NVTC), I am pleased to submit the *2021 Report on the Performance and Condition of the Washington Metropolitan Area Transit Authority (WMATA)* as directed by state code.

This year's report focuses on strategies to rebuild ridership: leveraging federal aid to sustain service levels; implementing attractive fare and parking policy changes; and encouraging and communicating a safe return to transit. The report outlines the expenditures of the Commonwealth's WMATA Capital Fund, which provided $154 million in dedicated capital funding to WMATA in FY 2021 and contributed to its $1.8 billion capital budget to support system safety and state of good repair improvements.

The October derailment and subsequent removal of the 7000-series trains from service – which had previously brought Metrorail reliability to an all-time high – shows that WMATA still has work to do to foster and sustain a safety culture within the organization. NVTC urges WMATA to continuously examine its internal maintenance and communication practices and to improve safety oversight efforts to restore rider confidence and provide safe and reliable service to the Commonwealth.

As this report outlines, the onset of the COVID-19 pandemic and the additional delays in returns to the office posed by the delta variant upended the ridership gains WMATA made in 2019 and early 2020. WMATA faces an uncertain future when its federal coronavirus aid is exhausted in FY 2024, but NVTC and its jurisdictions are committed to ensuring WMATA's success.

We look forward to working with our partners in the Commonwealth to help WMATA navigate a path toward post-pandemic financial and ridership recovery.

Sincerely,

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Chair

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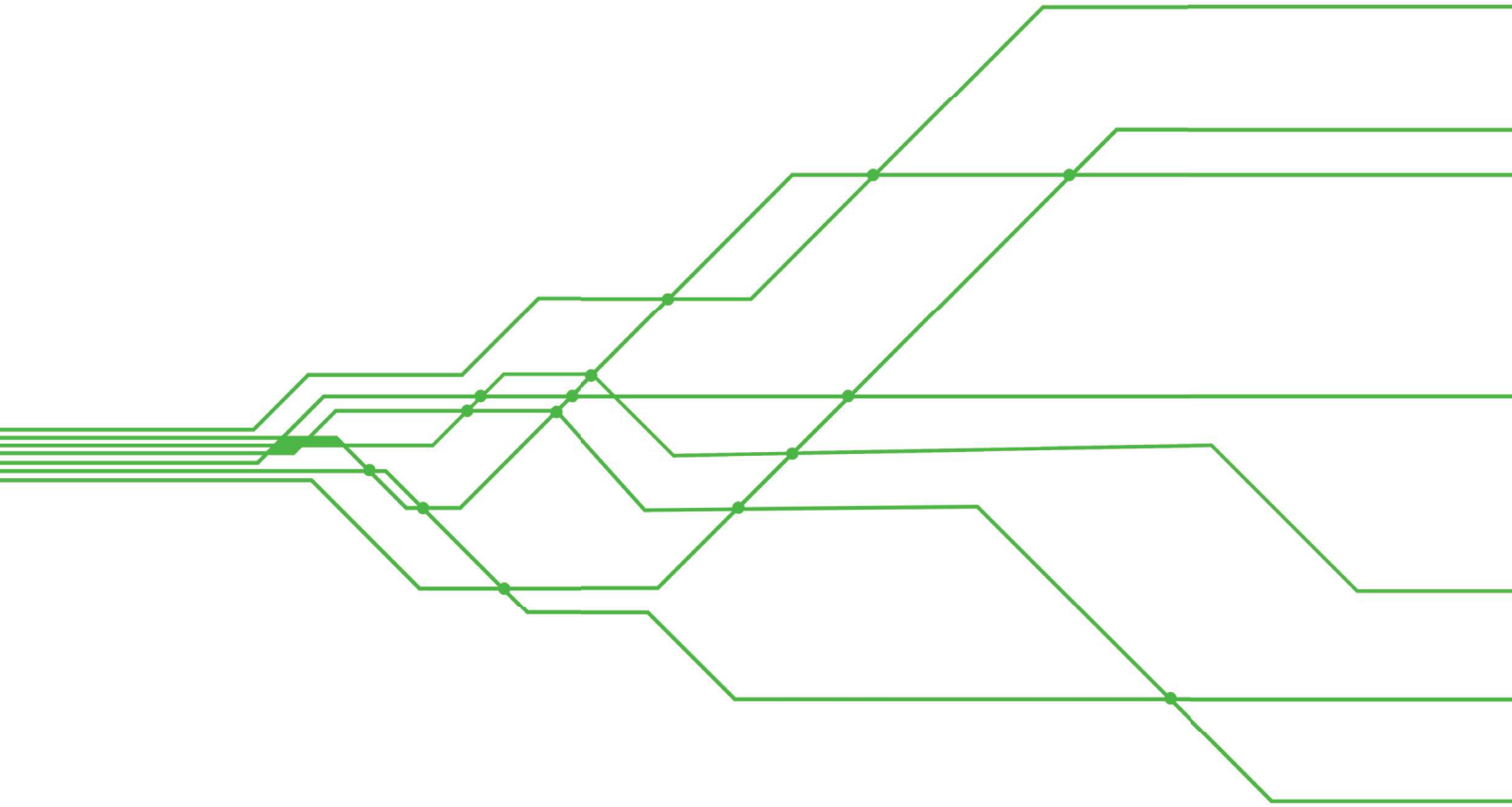

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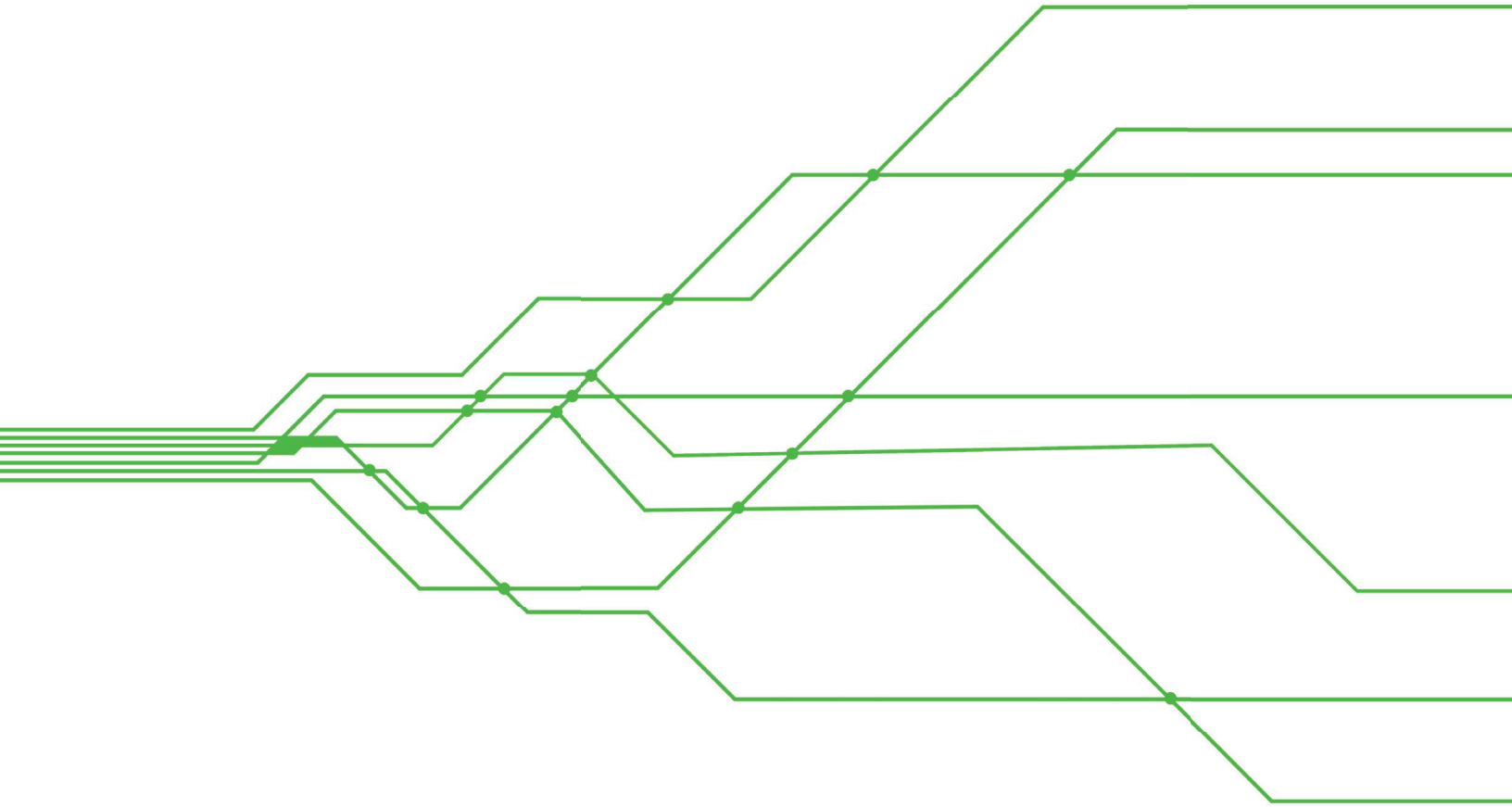
Special thanks to staff of our jurisdictional and state partners and WMATA for their comments and technical feedback.



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NORTHERN VIRGINIA TRANSPORTATION COMMISSION

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Executive Summary

In its *2021 Report on the Performance and Condition of the Washington Metropolitan Area Transit Authority* (WMATA), the Northern Virginia Transportation Commission (NVTC) recommends 18 strategies for WMATA to reduce the growth in operating costs and to improve the efficiency of operations. Each of these strategies are framed through the lens of the COVID-19 pandemic, with an understanding that altered travel patterns will likely linger in the years ahead. The report also presents annual performance, safety, reliability and financial performance data for fiscal year 2021 and calendar year 2020, both of which were impacted by the COVID-19 pandemic.

NVTC's Strategies for WMATA to Reduce Costs and Become More Efficient

NVTC's 2021 Annual Report includes 18 recommended strategies for WMATA to become more financially sustainable and a more effective transit system and mobility provider, the most important of which is to rebuild ridership.

Highlights of NVTC's 2021 recommendations to WMATA:

- **Leverage federal coronavirus relief aid** to prevent layoffs, sustain and improve service levels throughout a multi-year recovery period and position WMATA for a sustainable long-term ridership and revenue recovery.
- **Communicate and encourage a safe return to transit** by highlighting and promoting enhanced safety efforts during the COVID-19 pandemic and developing a long-term, post-pandemic marketing and communications strategy to rebuild ridership.
- **Implement fare and parking policy changes** that improve revenue and ridership, remove barriers to access and retain newly returning riders.
- **Adapt rail service to anticipate demand** during the COVID-19 pandemic and the region's subsequent recovery period while maintaining an equitable, baseline level of service across all Metrorail lines.
- **Continue focus on ongoing initiatives to reduce the growth in operating costs and improve operational efficiencies** using NVTC's previously recommended strategies in past annual reports on the performance and condition of WMATA.

Major Capital Accomplishments

WMATA's FY 2021 Capital program was the largest in WMATA history. Dedicated capital funding has allowed WMATA to continue its aggressive ramp up and delivery of capital projects to address long overdue state of good repair needs.

- **Platform rehabilitation program nearly complete.** The four-year project to rebuild 20 outdoor Metrorail station platforms is nearly complete. Major construction work at Arlington Cemetery and Addison Road stations concluded in the summer with 17 stations completed in total by the fall of 2021.

- **Metrorail and Metrobus fleet reliability were at an all-time high.** Prior to the October 2021 Blue Line derailment, Metrorail and Metrobus saw their highest fleet reliability performance in FY 2021 mainly due to the state of good repair program.
- **Mobile App and new fare technology introduced across the system.** WMATA expanded its mobile app to include Android and began installing new faregates at rail stations in FY 2021.
- **Cellular data service available in all Metrorail tunnels.** By installing fiber and upgrading radio communications throughout the rail system, WMATA made cellular and data service available for riders in all 100 miles of Metrorail tunnel track.

- **Track rehabilitation work yields dividends.** Using planned shutdowns and other forms of track availability, WMATA rehabilitated and maintained track structural components, replaced third-rail insulators and cleaned track beds, resulting in a steep reduction in the number of fires.

An uncertain post-pandemic recovery will exhaust federal aid

Prior to the COVID-19 pandemic, WMATA implemented several of NVTC's past recommendations and had seen promising signs that improvements in system reliability were rebuilding customer confidence and that rail and bus ridership were not just stable but growing. Changing travel patterns and increased telework suggest that WMATA's ridership recovery from the pandemic will be gradual over the years.

While federal aid is expected to sustain operations through FY 2023, it will be exhausted by FY 2024. With only a partial ridership recovery predicted at that time, WMATA anticipates an operating budget gap of over $500 million in the FY 2024 budget year. NVTC will continue to work with our local, Commonwealth and federal partners to support WMATA as it evolves to meet the Northern Virginia transit needs of a post-pandemic transit world.

Introduction

On March 11, 2020 the World Health Organization declared the COVID-19 virus a universal pandemic, setting in motion a series of actions at all levels of government that have impacted transit systems and riders in a way not experienced in generations. The executive actions imposed in the Commonwealth of Virginia, the State of Maryland and the District of Columbia – such as stay-at-home orders, mandatory business closures, social distancing requirements and office closures – resulted in a precipitous drop-off in both transit demand and ridership. Ridership for Northern Virginia's two rail systems – WMATA and Virginia Railway Express (VRE) – declined as much as 95% within weeks of the first orders. Metrobus and the six local transit providers across Northern Virginia, which complement the heavy rail systems, also saw significant drops in ridership.

With the sudden and significant loss of fare revenue, the additional and unplanned expenses to ensure the safety and cleanliness of transit and the abrupt loss of revenue to local jurisdictions that support transit in Northern Virginia, transit systems face significant financial shortfalls that will likely last for years. Thanks to Congress' passage of the Coronavirus Aid, Relief and Economic Security (CARES) Act in March 2020, the Coronavirus Response and Relief Supplemental Appropriations Act (CRRSAA) in December 2020 and the American Rescue Plan Act (ARPA) in March 2021, WMATA and other transit agencies received funding to maintain operations and offset revenue losses associated with the loss of ridership during the pandemic. This relief funding is anticipated to last through the FY 2022 and FY 2023 budgets, providing WMATA with the ability to maintain employees and services while positioning itself for recovery.

As safe and effective vaccines became widely available to the public in 2021, vaccination rates increased and the region moved into a recovery period. As restrictions lifted and businesses planned for a greater return of employees to the office, WMATA implemented service and fare improvements to attract and retain riders. With the rise of the COVID-19 delta and omicron variants, however, return to office plans have been postponed and WMATA has not seen the ridership recovery it previously anticipated. Uncertainty remains as WMATA and other transit agencies look to the future of how to maintain operations after federal aid is exhausted. Due to increasing telework and still evolving travel patterns, the impact of the COVID-19 pandemic will be felt in the transit industry for several years to come. NVTC will continue to work with WMATA, as well as local transit operators and VRE, to safely get riders back on transit.

Safety, Reliability, Financial and Ridership Performance Data

A large portion of this report is dedicated to tracking the key safety, reliability, financial and ridership metrics shown in chapters 3-5. Data included in the report (Table 1) come from the National Transit Database (NTD) and WMATA Metro Performance Reports (MPR). Some data points have a lag of 12 to 18 months, meaning that for this report all current data sources will cover some time period that reflects the impacts of the COVID-19 pandemic, with some data sources covering more than others. The pandemic has impacted each metric in different ways which will be further discussed in chapters 3-5.

Table 1: Data Sources and Years Presented in this Report

Report Category	Latest Year for which Data is Publicly Available	Data Source
Safety	Calendar Year 2020 *(January 1, 2020 to December 30, 2020)*	NTD
Reliability	Fiscal Year 2021 *(July 1, 2020 to June 30, 2021)*	MPR
Financial Performance	Fiscal Year 2020 *(July 1, 2019 to June 30, 2020)*	NTD
Ridership	Fiscal Year 2020 *(July 1, 2019 to June 30, 2020)*	NTD

Legislative Requirement for this Report

This report fulfills the requirements of §33.2-3402 of the Code of Virginia, pursuant to Chapter 854 of the 2018 Virginia Acts of Assembly, specifying that NVTC report annually on the performance and condition of WMATA, for both Metrorail and Metrobus. Per statute, the report addresses six elements:

- Potential strategies to reduce the growth in costs and to improve the efficiency of WMATA operations
- Use of the dedicated capital funds authorized by the legislation to improve the safety and condition of the rapid heavy rail mass transportation system
- The safety and reliability of the rapid heavy rail mass transportation system and bus network
- 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
- 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
- Ridership of the rapid heavy rail mass transportation system and the bus mass transportation system

1. Strategies to Reduce the Growth in Costs and Improve Operational Efficiencies

State code requires NVTC to recommend potential strategies to WMATA to reduce the growth in operating costs and improve operational efficiency. This annual report updates the previous year's recommendations in light of the ever-evolving COVID-19 pandemic and WMATA's response and recovery. The COVID-19 pandemic has dramatically lowered WMATA's ridership on bus and rail, causing significant declines in farebox revenues. This revenue decline has been offset by COVID-19 related federal aid and has allowed WMATA to restore services and avoid layoffs. The exact long-term impacts of the pandemic on ridership and WMATA's farebox recovery are uncertain and pose significant challenges to WMATA's long-term financial sustainability as federal aid is anticipated to be exhausted in FY 2024.

In previous reports, the Commission made policy and program recommendations that should help WMATA improve efficiency, increase ridership and increase revenue. These recommendations are still relevant and WMATA has taken several service and fare policy actions consistent with previous NVTC recommendations as part of their pandemic recovery efforts to rebuild ridership. This chapter describes NVTC's recommendations that would help to reduce the growth in operating costs and improve operational efficiency and highlights recent major accomplishments by WMATA in those areas.

Strategy 1: Rebuild Metrorail and Metrobus Ridership

Rebuilding Metrorail and Metrobus ridership is critical to improving the efficiency of the system, controlling subsidy growth and increasing farebox revenues. WMATA has actively pursued several initiatives to rebuild ridership that align with NVTC recommendations.

Recommended Strategies

Leverage federal aid to prevent layoffs, sustain and improve service levels throughout a multi-year recovery period and position WMATA for a sustainable long-term ridership and revenue recovery

From the Coronavirus Aid, Relief, and Economic Security (CARES) Act to the Coronavirus Response and Relief Supplemental Appropriations Act of 2021 (CRRSAA) and American Rescue Plan Act (ARPA) of 2021, WMATA has received over $2.8 billion in federal aid for transit to help improve safety, sustain operations and avoid layoffs. $349 million of the aid from all three bills was provided as a credit of non-federal funding to the jurisdictions to maintain local transit service. The latest aid bill, the ARPA, provided WMATA with the ability to sustain operations through FY 2023 but the aid would be exhausted in FY 2024 with a projected operating budget gap of at least $500 million. This aid provides WMATA with the ability to improve service, navigate uncertainty and sustain a multi-year recovery period that can help position WMATA for post pandemic recovery.

Communicate and encourage a safe return to transit

As the region enters a recovery period, WMATA should improve its safety culture and promote ongoing enhanced safety efforts by developing a long-term, post-pandemic marketing and communications strategy to help rebuild ridership and restore customer confidence. While WMATA expects a gradual recovery, the long-term impacts of the pandemic on riders' perceptions are unknown. Bringing back and retaining riders who did not ride during the pandemic or after the October 2021 Blue Line Derailment is critical to rebuilding ridership and fare revenue.

Implement fare and parking policy changes that improve revenue and ridership, remove barriers to access and retain newly returning riders

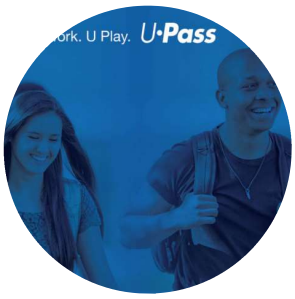
The post pandemic recovery period offers an opportunity to revisit WMATA's fare and parking fee structure. Offering pass products and other fare policy changes will remove barriers to access and retain newly returning riders, increasing both revenue and ridership. With fewer riders due to the pandemic, WMATA should consider reducing parking rates at underutilized parking facilities. Fare pass products generally encourage ridership with the potential to increase revenue, therefore changes to passes should be considered to drive and retain riders and appeal to unmet market demand in a post-pandemic environment.

Better balance the weekend customer experience with service disruptions for weekend track work

Preventative maintenance and capital project work during operating hours on Metrorail are often accompanied by service disruptions and increased wait times for trains or additional transfers, all of which have a negative impact on service and weekend ridership. WMATA should improve weekend rail service by developing customer-focused service standards and operating procedures for planned weekend track service disruptions to minimize the impacts on riders.

Develop the next generation of fare collection technology and support strategic fare collection initiatives

WMATA's fare collection systems have aged beyond their lifespan and are being replaced and modernized. Modern and reliable fare collection technology provides new methods for customers to pay fares, improves convenience and reliability and decreases repair costs.[1] NVTC supports fare collection modernization efforts and coordination with WMATA through the Northern Virginia Fare Collection Strategic Plan.[2]



Pursue partnerships with the business community and other stakeholders to provide easier access to transit for employees and visitors

Employers, universities and other businesses offer opportunities to drive ridership by providing fare media and other fare products to students, visitors and employees. WMATA offers unlimited Metrobus and Metrorail rides to full time college students through the University Pass program. WMATA has also entered into discounted fare agreements with several jurisdictions, including Fairfax County, where eligible students can ride Metrobus for free with the costs reimbursed by the sponsoring jurisdictions. WMATA should continue to pursue partnerships with the business community and other stakeholders.

Implement efforts on bus and rail to decrease fare evasion

WMATA estimates that, pre-pandemic, fare evasion on bus and rail costs the agency approximately $40 million on an annual basis.[3] Each state or local government, not WMATA, makes the applicable laws surrounding fare evasion within their respective jurisdictions. WMATA has taken several steps to better measure fare evasion and is working to install electronic gate sensors and other technology to provide better data on occurrences. WMATA should work with local jurisdictions to decrease fare evasion on rail and bus.

Major Recent Accomplishments

Metrorail and Metrobus provide all day frequent service

In anticipation of new travel patterns as the region reopens, WMATA provided increased off-peak Metrorail service on weekdays starting in September 2021. During off-peak hours, trains operated every 6 minutes on the Red Line and every 12 minutes on all other lines. During peak hours trains operated every 5 minutes on the Red Line and every 10 minutes on all other lines. In addition, 20 Metrobus lines operated every 12 minutes or better and 16 bus lines operated every 20 minutes or better, for most of the day all week.[4]

NVTC's Recommendation: Leverage federal aid to prevent layoffs, sustain and improve service levels throughout a multi-year recovery period and position WMATA for a sustainable long-term ridership and revenue recovery

Post-pandemic marketing campaign

In August 2021 WMATA debuted a marketing campaign, "Doing Our Part," to advertise its COVID safety precautions and assure the public and busines community that Metrorail and Metrobus are safe and ready for riders as the region reopens.

NVTC's Recommendation: Communicate and encourage a safe return to transit.

Mobile fare payment launched for Apple and Android

In 2020 and 2021 WMATA launched a mobile app allowing both Apple and Android users to pay their fares with their phones. Mobile fare payments are now accepted anywhere SmarTrip is used, including on all regional bus providers.

NVTC's Recommendation: Develop the next generation of fare collection technology and advance strategic fare collection initiatives

WMATA partners with Capital Bikeshare

In August 2021 WMATA announced a partnership with Capital Bikeshare, the DC region's bikeshare system, to offer free bike rides to eligible WMATA customers.[5] By creating a mobile SmarTrip card and signing up for the offer through the end of the year, one could earn 10 free bike rides.

NVTC's Recommendation: Pursue partnerships to improve access to transit

WMATA installs new faregates at Metrorail stations

In 2021 WMATA began the systemwide replacement of faregates at all 91 Metrorail stations.[6] The old faregates were more than 25 years old and at the end of their lifespan. The new, modern faregates make it quicker and easier to ride; are upgradable for future technology; and include enhanced safety features, larger displays and faster processing.

NVTC's Recommendation: Implement efforts on bus and rail to decrease fare evasion

WMATA implements free transfers between Metrobus and Metrorail

In the fall of 2021, WMATA increased the discount provided to customers when they transfer to/from Metrobus and Metrorail - effectively providing free transfers between most Metrobus rides and Metrorail. The changes also included a free transfer between most trips taken on local buses to Metrorail. These changes help move the region towards a more seamless and efficient transit system by reducing the need to run bus service that is wholly redundant to Metrorail.

NVTC's Recommendation: Implement fare policy changes that improve revenue and ridership, remove barriers to access and retain newly returning riders

Better weekend rail service

In June 2021 the WMATA Board of Directors approved improvements to weekend rail service. On weekends the Blue, Orange, Green, Yellow and Silver Line headways would be improved to 12 minutes (from 15) and Red Line headways would be improved to 6 minutes (from 12). These improvements are anticipated to be implemented in FY 2022.

NVTC's Recommendation: Utilize federal aid to prevent layoffs, sustain and improve service levels throughout a multi-year recovery period and position WMATA for a sustainable long-term ridership and revenue recovery

Strategy 2: Improve the Operational Efficiency of Metrorail and Metrobus

While rebuilding ridership improves farebox recovery, several areas remain where WMATA can deliver service more efficiently. Some of these efforts are within WMATA's control, while many efforts – especially with Metrobus – require extensive coordination and support from local and state agencies. Improving operational efficiency yields costs savings for the agency and can also benefit customers. Since labor costs are approximately 70% of WMATA's total operating costs, these recommendations focus on strategies that impact the non-labor portion of the operating budget (approximately 30%) to yield the most productivity and capacity out of existing service.[7]

Recommended Strategies

Adapt rail service to anticipate demand during the pandemic and subsequent recovery period

With the rapid decline in ridership due to the pandemic and limited labor availability due to COVID safety measures, WMATA reduced the level of Metrorail service when compared to pre-pandemic levels. At different phases of recovery during the pandemic, services were adjusted to reflect and anticipate demand and provide enough capacity for social distancing.

Pursue capital investments that increase the reliability and efficiency of the system

Continuing state of good repair investments is critical to maintain system reliability, retain current riders and attract new riders. WMATA is rebuilding and modernizing Metrorail and Metrobus facilities as it addresses state of good repair needs. This modernization includes opportunities to pursue energy efficiency strategies and reduce future maintenance costs. Projects like rail traction power upgrades and reconstruction of bus garages will enable WMATA to accommodate additional demand and improve operational efficiency. As the technology continues to evolve, WMATA should explore and evaluate opportunities to improve bus efficiency through low or zero-emissions technology, monitoring energy consumption with smart meters and the implementation of facility maintenance best practices.[8]

Leverage the expertise of local and regional partners to improve the efficiency of the bus network

Increasing the speed and efficiency of Metrobus operations requires partnerships with local and regional partners who manage local roadways and traffic patterns. WMATA's Bus Priority Program plans and implements new initiatives to advance bus priority strategies in partnership with local jurisdictions.[9] WMATA should continue to work with local and state partners to improve the efficiency of the bus network, implement bus priority projects and explore pilot programs and other efforts to increase the reliability of Metrobus operations.

Major Recent Accomplishments

Railcar reliability at an all-time high in FY 2021

Since the acquisition and deployment of the 7000-series railcars, railcar reliability has increased 239% percent between FY 2018 and FY 2021. This was the highest level of railcar reliability on record prior to the October 2021 Blue Line derailment and subsequent removal from service of the 7000-series. In March 2021 WMATA selected Hitachi Rail to build the system's 8000- series railcars, which will replace the aging 2000 and 3000-series railcars which have been in service since the early 1980s.[10]

NVTC's Recommendation: Pursue capital investments that increase the reliability and efficiency of the system

17 Metrorail station platforms rebuilt and refurbished

WMATA has nearly completed its Platform Improvement Project, an initiative to reconstruct 20 outdoor station platforms that were deteriorating and in need of major repair. Over the last three years, 12 station platforms have been reconstructed in Virginia and this year WMATA completed reconstruction at the Cheverly, Landover and New Carrollton stations in Maryland.[11]

NVTC's Recommendation: Pursue capital investments that increase the reliability and efficiency of the system

WMATA Board adopts updated Metrobus Service Guidelines

In December 2020 the WMATA Board adopted new Metrobus Service Guidelines, which provide the building blocks for service planning and budget decisions and include targets for productivity and efficiency.[12] These service guidelines are the first update in over 20 years and provide a framework for the Metrobus Network Redesign effort.

NVTC's Recommendation: Leverage the expertise of local and regional partners to improve the efficiency of the bus network

Metrorail runs all eight-car train during the pandemic and recovery period

As part of its pandemic response, WMATA ran all eight-car 7000-series trains between April and mid-August of 2020 to ensure service reliability and social distancing on railcars. The rail service plan in the FY 2022 adopted budget supports all eight-car train operations throughout the day.

NVTC's Recommendation: Adapt rail service to anticipate demand during the pandemic and subsequent recovery period

Strategy 3: Increase Non-Fare Revenues

Non-fare revenues are derived by WMATA from sources other than fares, such as parking, joint development, advertising and other sources. Strategies to generate non-fare revenue leverage existing assets to help mitigate the challenges of having reduced ridership revenue. However, the pandemic has dramatically reduced fare revenue and traditional sources of non-fare revenue. While this immediate revenue shortfall is outside of WMATA's control, strong non-fare revenue policies take time to yield results and will help with the post-pandemic recovery by providing additional resources to maintain service, diversify funding sources and control subsidy growth.

Recommended Strategies

Leverage the value of WMATA's existing assets by maximizing advertising revenues and optimizing parking revenues

With 91 rail stations and nearly 60,000 parking spaces, WMATA has a large physical footprint across the region and actively leverages the value of these facilities through advertising revenues and parking revenues.

Pursue joint development opportunities on underutilized assets

Joint development is a type of public-private partnership in which real estate developers co-locate private real estate near transit. WMATA has an active joint development program, completing more than 30 projects since 1975 that generate revenue and ridership for the system.[13]

Pursue a real estate and sustainability strategy for WMATA facilities that generates operating efficiencies

WMATA is pursuing other real estate investment strategies, including selling surplus property, to generate revenue and improve efficiencies. In 2018 the WMATA Board approved an office consolidation strategy to save on capital and operating expenses by strategically locating its facilities and reducing the number of office buildings it owns.[14]

Major Recent Accomplishments

Agreement signed for Joint Development project at West Falls Church

In August 2021 WMATA signed an agreement to redevelop the West Falls Church Metro Station site to create a vibrant, mixed-use community with over one million square feet of office, retail and residential space. The project is the result of a multi-year effort between WMATA, the development team and Fairfax County. The development will generate long-term revenue through 99-year ground leases as well as additional fare revenue.[15]

NVTC's Recommendation: Pursue joint development opportunities on underutilized assets

WMATA to add solar panels at four Metrorail stations

In 2020 WMATA reached an agreement to install solar paneled carports or canopies over surface lots and parking garages at the Anacostia, Cheverly, Naylor Road and Southern Avenue Metrorail Stations in Washington, DC and Maryland. The solar installation will generate power and provide annual payments to WMATA. [16] [17]

NVTC's Recommendation: Pursue a real estate and sustainability strategy for WMATA facilities that generates operating efficiencies

WMATA approved a joint development for its headquarters site

In 2020 the WMATA Board approved a joint development for its existing headquarters building. WMATA will move office staff to three new buildings in Virginia, Washington DC and Maryland and decrease the number of office buildings from 10 to four.[18] The DC office building is anticipated to be completed in FY 2022 and the VA and MD office buildings in FY 2023. This strategy will result in an estimated $130 million in savings over the next 20 years.[19]

NVTC's Recommendation: Pursue a real estate and sustainability strategy for WMATA facilities that generates operating efficiencies

Strategy 4: Control Cost Escalation and Enhance Efficiency of the Workforce and Contracted Services

Implementing cost and work efficiencies is only part of the solution to controlling cost escalation in WMATA's operating subsidy growth. The 2019 "Keeping Metro Safe, Reliable and Affordable" strategic plan identified labor costs as nearly 70% of WMATA's total operating expenditures.[20] As most employees at WMATA are covered by multi-year collective bargaining agreements, there are opportunities to control cost escalation in these negotiations. For strategies that are outside of WMATA's direct control, this report recommends that WMATA seek certain actions or conditions by external parties that would result in labor cost savings.

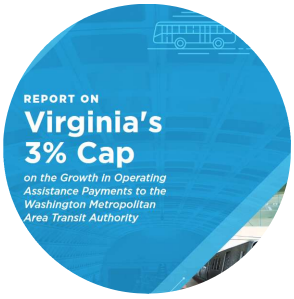
Recommended Strategies

Adequately fund WMATA's Office of the Inspector General (OIG)

The WMATA OIG is an independent office that conducts and supervises audits, program evaluations and investigations; promotes economy, efficiency and effectiveness; and prevents fraud and abuse in WMATA related activities.

Encourage and enable innovative solutions that improve productivity

In 2017 the WMATA General Manager increased accountability by introducing new controls on absenteeism to improve oversight and reduce the use of overtime.[21]



Use the 3% cap on annual growth in operating subsidies as a tool during labor negotiations and annual budget development

Enacted in the landmark transit funding legislation in 2018, Virginia's legislative cap on the growth in WMATA's operating subsidy provides WMATA with a tool to examine spending and controls costs during labor negotiations and the annual budget development process.[22]

Seek amendments to the federal Wolf Act to require arbitrators in WMATA contract mediations to consider WMATA's fiscal condition in all cases

The National Capital Area Interest Arbitration Standards Act (Wolf Act) of 1995 governs the actions of arbitrators in the arbitration of labor disputes involving transit agencies operating in the national capital area.[23] WMATA's adopted strategic plan calls for reforming this act to reflect WMATA's true financial capacity and to drive decisions that are in line with the jurisdictions ability to pay.[24]

Identify and evaluate options to address unfunded OPEB liabilities

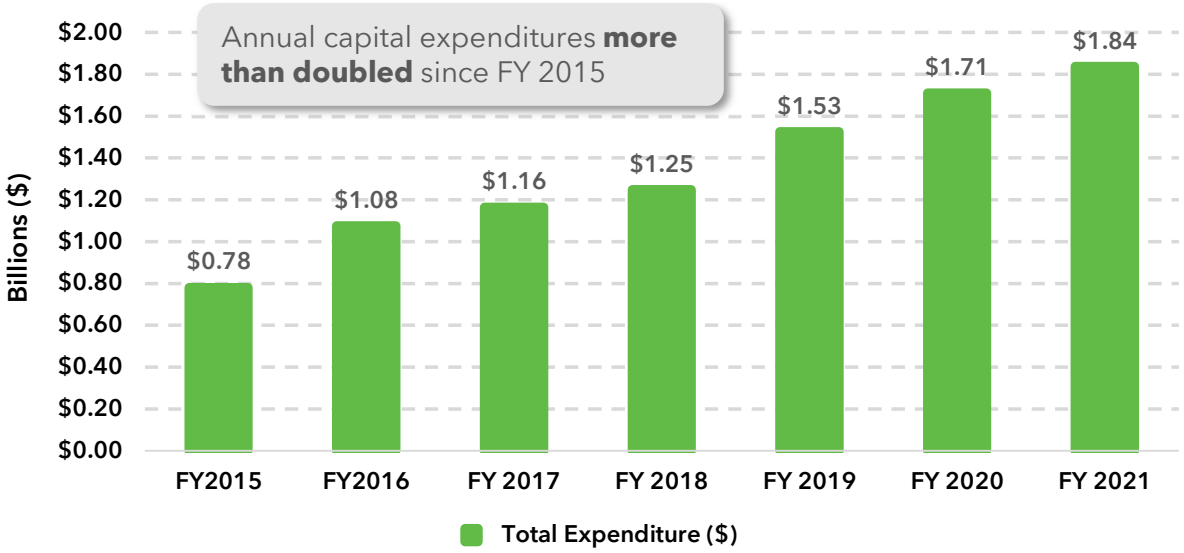
Other Post-Employment Benefits (OPEB) include non-pension costs for retiree medical and prescription drug coverage and life insurance. In FY 2020 WMATA had a $2.3 billion unfunded OPEB liability.[25]

2. Use of Dedicated Capital Funds

In 2018 the Commonwealth of Virginia, the State of Maryland and the District of Columbia came together to bring $500 million a year in dedicated capital funding for WMATA. Virginia's annual portion of regional dedicated funding is approximately $154 million, with the District of Columbia and State of Maryland providing the remaining portion. Dedicated funding strengthens WMATA's ability to embark on large, multi-year capital investments designed to address significant state of good repair needs. Virginia's dedicated funding supports WMATA's capital investments and project delivery across the system and can be used for any capital purpose.

WMATA's capital needs show a state of good repair backlog of approximately $5 billion in FY 2019. Over the last seven years, WMATA has ramped up its annual capital expenditures in order to address this backlog and other modernization needs. In FY 2015 WMATA spent $780 million on its capital program. With a sustained focus on capital renewal, WMATA has more than doubled its capital expenditures to $1.835 billion in FY 2021. The ability to issue bonds backed by the dedicated capital funding has given WMATA the financial footing to ramp up its annual capital expenditures to address the backlog of state of good repair efforts. Since the funding's inception, WMATA has authorized over $1.4 billion in dedicated capital funding bonds, which will be paid for with future dedicated capital funding revenues.

Figure 1: WMATA Annual Capital Expenditures from FY 2015 to FY 2021



Source: WMATA FY 2015-2021 Financial Reports

WMATA uses several sources to fund its capital program including federal funding, regional dedicated funding, state and local contributions and other sources. As required by law, NVTC must include the uses of funds from the WMATA Capital Fund (Virginia's dedicated capital funding) from the prior fiscal year in this report. Table 2 shows the actual expenditures of the fund for FY 2021 by Capital Improvement Plan (CIP) Program Area. WMATA provides additional information on progress made in the overall capital program during FY 2021 in WMATA's Quarter 4 FY 2021 Financial Report.[26]

Table 2: FY 2021 Expenditures from the Virginia WMATA Capital Fund by CIP Program

CIP Category	CIP Program	FY 2021 Actual Expenditures (millions)[27]
Railcar Investments	Railcar Acquisition	$1.5
	Railcar Maintenance/Overhaul	$1.15
	Railcar Maintenance facilities	$7.9
	Total	**$10.6**
Rail Systems Investments	Propulsion	$13.3
	Signals & Communication	$4.9
	Total	**$18.2**
Track and Structures Rehabilitation Improvements	Fixed Rail	$10.6
	Structures	$6.71
	Total	**$17.4**
Stations and Passenger Facilities Investments	Platforms & Structures	$21.4
	Vertical Transportation	$2.6
	Station Systems	$25.6
	Total	**$49.6**
Bus and Paratransit Investments	Bus and Paratransit Acquisition	$1.8
	Bus Maintenance/Overhaul	$1.2
	Bus Maintenance Facilities	$2.9
	Bus Passenger Facilities/Investments	$2.8
	Total	**$8.7**
Business Support Investments	Information Technology	$19.2
	Metro Transit Police Department	$0.2
	Support Equipment/Services	$30.8
	Total	**$50.3**
Total Capital Programs		**$154.9**

Source: WMATA[28]

Note: Totals may not add due to rounding.

In FY 2021 WMATA invested $1.8 billion in capital projects. The capital budget's major priority is investing in state of good repair projects. Significant FY 2021 capital accomplishments included:

Platform Rehabilitation Program nearly complete

The four-year Platform Improvement Project continued with its goals to address station system improvements. The major construction work at Arlington Cemetery and Addison Road concluded in Q4 and both stations reopened to the public. As of Q1 of FY 2022, 17 of 20 outdoor stations have been reconstructed, 12 of which were in Virginia.

CIP program category: Stations and Passenger Facilities Investments

Metrobus fleet reliability at an all-time high

In FY 2021 Metrobus fleet reliability was at an all-time high, mostly due to the state of good repair program. WMATA acquired 121 new clean diesel buses, 12 new compressed natural gas buses and 177 hybrid sedans for paratransit service. WMATA also completed 100 bus rehabilitations and rebuilt 272 fareboxes, 138 transmission assemblies and 89 engine assemblies.

CIP program category: Bus and Paratransit Investments

Updates in station system technology

WMATA debuted an expanded mobile app and new modernized faregates in FY 2021. Mobile fare payments using the SmarTrip mobile application now include Android as well as Apple devices, available anywhere SmarTrip is accepted. Installation of new faregates has begun across the system and bus farebox replacements are scheduled to begin in FY 2022.

CIP program category: Stations and Passenger Facilities Investments

Bus garage modernization program advances at Bladensburg

WMATA is aggressively reconstructing bus facilities. The Bladensburg bus maintenance and operations facility has concluded pre-construction activities and will begin demolition and construction in FY 2022. When completed, the new LEED-designed building will accommodate up to 300 buses and support future electric vehicle charging infrastructure.

CIP program category: Bus and Paratransit Investments

Cellular data service available in all Metrorail tunnels

In FY 2021 WMATA spent $212 million on rail system investments, including advancements to the Automatic Train Control (ATC) State of Good Repair Program, the Low Voltage Power State of Good Repair program and the Radio Infrastructure Replacement project. By installing fiber and upgrading radio communications, WMATA made cellular and data service available for riders in all 100 miles of Metrorail tunnel track.

CIP program category: Rail Systems Investments

Track rehabilitation work yields dividends

Using planned shutdowns and other forms of track availability, WMATA rehabilitated structural components, deck joints, concrete and grout pads that support the track structure, as well as replaced illegible roadway track signs, repaired leaks, rehabilitated drains and cleaned track beds. These efforts are integral to bringing and maintaining the system at a state of good repair and contributed to a reduction in fire incidents of 50% in FY 2021.[29]

CIP program category: Track and Structures Rehabilitation Investments

New office buildings continue construction

WMATA continued construction on its new headquarters in DC and anticipates a completion date in FY 2022. The additional Virginia and Maryland office locations are expected to be completed by FY 2023. This Office Consolidation Strategy will enable Metro to consolidate from 10 office buildings to four.

CIP program category: Business and Operations Support Investments

Railcar fleet reliability at an all-time high in FY 2021

Prior to the October 2021 Blue Line derailment, WMATA saw significant improvements in railcar fleet reliability in FY 2021.[30] To continue this trend in strong fleet reliability, 68 2000 and 3000-series cars and 62 6000-series cars were rehabilitated in FY 2021. The 7000-series will begin rehabilitations in FY 2022. WMATA has begun conceptual designs for the 8000-series, which will replace the aging 2000 and 3000-series railcars.

CIP program category: Railcar and Railcar Facilities Investments

3. Safety and Reliability

WMATA consistently communicates that passenger and employee safety and security is its highest priority with a focus on 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, with 134 times fewer fatalities occurring on transit than on highways.[31] For Metrorail, oversight for safety and security concerns are provided by the Washington Metrorail Safety Commission (WMSC), the state safety oversight organization required by federal law. The WMSC supports the WMATA Board of Directors' and General Manager's emphasis on system safety.[32] Reliability can be measured in terms of a transit service's on-time performance, as well as the frequency of equipment break downs.

3.1 Safety

Transit systems seek to minimize the frequency of all safety events. The Safety & Security (S&S) Time Series present safety and security data reported to the National Transit Database (NTD), through the S&S-40 form (Major events) and the S&S-50 form (Non-Major monthly summary form). NTD measures transit safety by summarizing the total occurrences, Major and Non-Major, of certain safety events for rail and bus operations that include collisions, derailments (for rail only), fatalities,[33] fire, injuries and security events.[34]

The NTD provides safety data on a calendar year basis, unlike all other data presented in this report which is reported on a fiscal year basis. The counts represented in Table 3 and Table 4 are total counts for each category from when they were accessed from NTD. This time series data is subject to a validation process and current and previous years' data may be revised by transit agencies based upon additional data on its operations or upon request by NTD analysts.[35] The following tables show the data as it was accessed in October 2021 and may show slightly different results for past calendar years as shown in previous NVTC reports. The official NTD definitions for each term are provided in the Appendix.

Data provided in this section is from CY 2020 (January 1, 2020 to December 31, 2020) and reflects ridership impacts due to the COVID-19 pandemic and implementation of safety protocols by WMATA beginning in March 2020.

Table 3 summarizes the total count of each type of Metrorail safety event for calendar years 2017, 2018, 2019 and 2020.

Table 3: Metrorail Safety

NTD Category	Safety Event	Count, CY 2017	Count, CY 2018	Count, CY 2019	Count, CY 2020
Events	Collision	8	14	12	10
	Derailment	5	6	2	2
	Security Event	46	52	78	49
	Fire	101	65	71	39
Fatalities	Fatality	2	6	8	6
Injuries	Injury	323	350	389	188

Source: WMATA NTD Report, Form S&S-40 (Collision, Derailment and Security Event) and S&S-50 (Fire, Fatality and Injury).[36] Accessed October 5, 2021.

Table 4 summarizes the total count of each Metrobus safety event for calendar years 2017, 2018, 2019 and 2020.

Table 4: Metrobus Safety

NTD Category	Safety Event	Count, CY 2017	Count, CY 2018	Count, CY 2019	Count, CY 2020
Events	Collision	166	210	203	98
	Derailment	N/A	N/A	N/A	N/A
	Security Event	38	51	59	31
	Fire	8	1	4	1
Fatalities	Fatality	0	0	0	1
Injuries	Injury	505	538	535	238

Source: WMATA NTD Report, Form S&S-40 (Collision, Derailment and Security Event) and S&S-50 (Fire, Fatality and Injury).[37] Accessed October 5, 2021.

3.2 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 (OTP)** is the rate at which a transit system carries passengers to their destination on time and is used to evaluate the timeliness of travel for both rail and bus operations.

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 railcar used to transport passengers.[38]

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.[39]

Reliability data is obtained from the annual Metro Performance Reports, produced by WMATA, which reports data on a fiscal year basis. The data included in this report is for fiscal years 2018, 2019, 2020 and 2021 and covers the entire relevant fiscal year (from July 1 to June 30 of that respective fiscal year) unless otherwise noted.

3.2.1 On-Time Performance

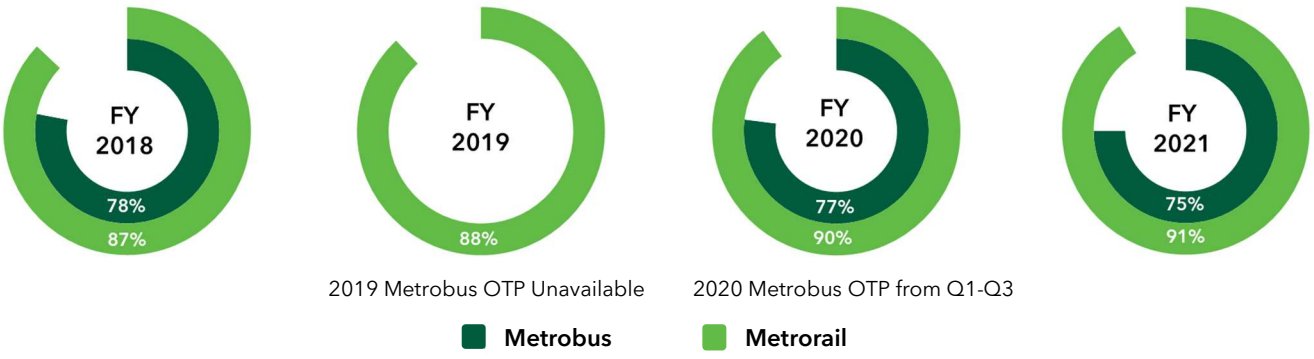
On-time performance (OTP) is reported for fiscal years 2018, 2019, 2020 and 2021. OTP is measured differently for Metrorail and Metrobus.

Metrorail customer OTP measures the percentage of customers who complete their journey within the maximum amount of time it should take per WMATA service standards. These standards vary by line, time of day and day of the week, and is informed by a customer's entry and exit from the system. Reference Appendix for the standard WMATA definition.[40]

Metrobus OTP data is schedule-based for FY 2018 and schedule and headway-based for FY 2020 (pre-pandemic) and FY 2021. FY 2019 Metrobus OTP was not available due to data quality errors. FY 2020 Metrobus data are for a pre-pandemic period of July 1, 2019 to March 15, 2020. All other data are reported for the full fiscal year. Reference Appendix for detailed methodology and data availability for each fiscal year.

Figure 2 summarizes Metrorail and Metrobus OTP in FY 2018, FY 2019, FY 2020 and FY 2021. As previously noted, Metrobus OTP data for FY 2020 is provided for a pre-pandemic period of July 1, 2019 to March 15, 2020, while previous fiscal year's data are provided for the full fiscal year.

Figure 2: On-Time Performance by Mode



Note: FY 2020 Metrobus data are for a pre-pandemic period of July 1, 2019 to March 15, 2020. All other data are reported for the full fiscal year. Metrobus on-time performance data is schedule based for FY 2018 and schedule and headway based for FY 2020 (pre-pandemic) and FY 2021.

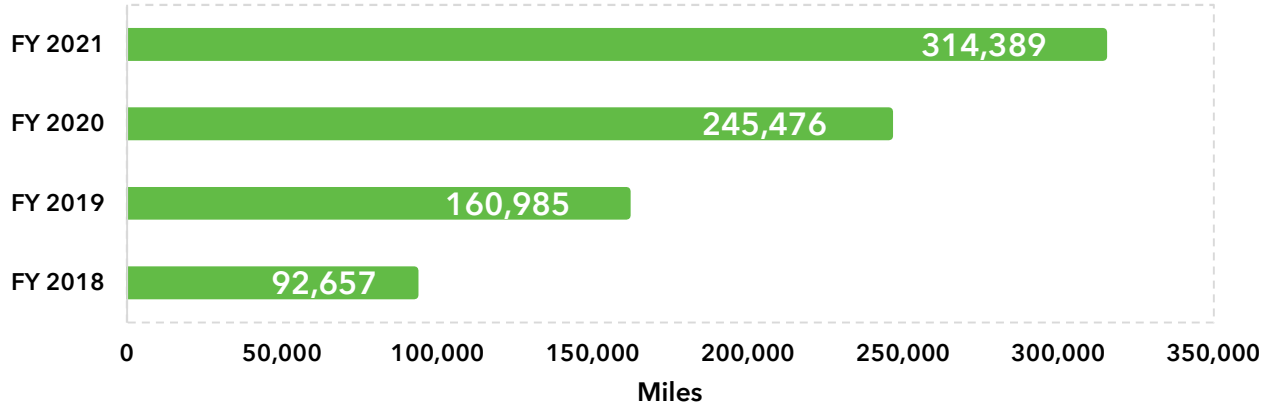
Source: Metro Performance Report FY 2021

3.2.2 Mean Distance between Delays/Failures

Mean distance between delays (MDBD) indicates the average number of miles traveled between vehicle failures that delay rail or bus service. The Metro Performance Report presents MDBD only for Metrorail and the equivalent metric for Metrobus reliability is mean distance between failures (MDBF). Higher MDBD/MDBF indicates greater reliability of Metro railcar and bus equipment.

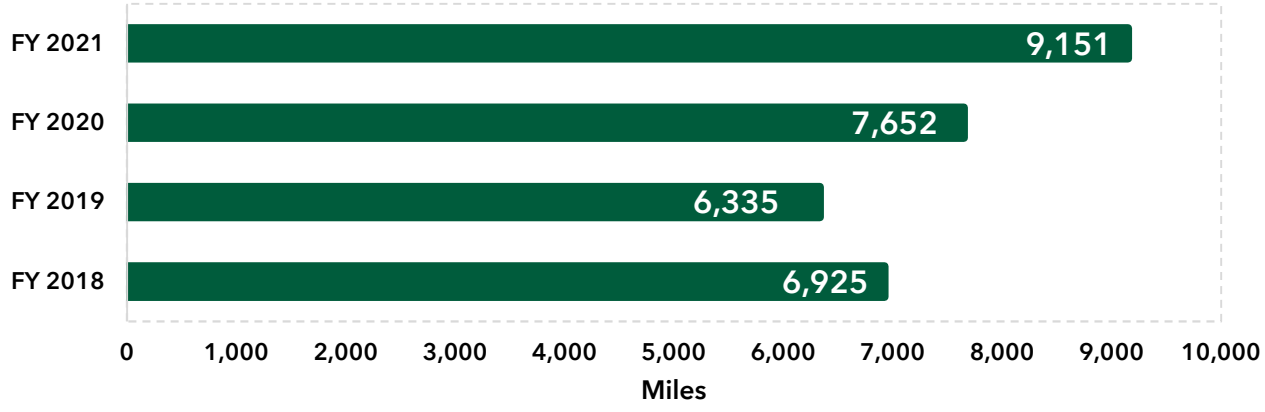
Figure 3 and Figure 4 summarize the Metrorail and Metrobus reliability figures for FY 2018, FY 2019, FY 2020 and FY 2021.

Figure 3: Metrorail Equipment Reliability, MDBD



Source: Metro Performance Report FY 2021

Figure 4: Metrobus Equipment Reliability, MDBF



Source: Metro Performance Report FY 2021

4. Metrorail and Metrobus Financial Performance

Metrorail financial performance measures are required by §33.2-3401 of the Code of Virginia, pursuant to Chapter 854 of the 2018 Virginia Acts of Assembly. Transit agencies, as a public service, aim to minimize cost and deliver service as efficiently as possible, using the following three measures:

1. Metrorail Farebox Recovery and Metrobus Farebox Recovery
2. Metrorail Service per Rider and Metrobus Service per Rider
3. Cost per Metrorail Service Hour and Cost per Metrobus Service Hour

NTD FY 2020 data is reported for each of the above measures and includes calculations for both Metrorail and Metrobus. For Metrobus, data presented includes both services that are directly operated by WMATA and those which are operated by a contracted provider.[41] It is also important to note that due to robust auditing and review processes, NTD data is typically released at least one or more years after the fiscal year it represents. Data provided in this section is from the full FY 2020 (July 1, 2019 to June 30, 2020) and reflects impacts on ridership due to the COVID-19 pandemic and implementation of safety protocols by WMATA beginning in March 2020.

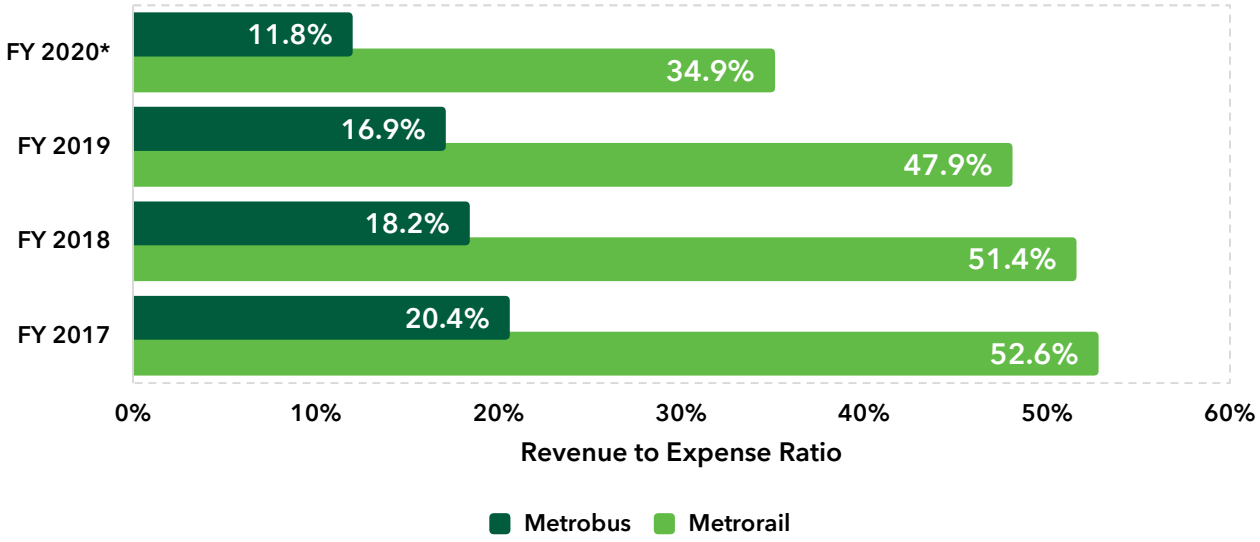
4.1 Metrorail and Metrobus Farebox Recovery

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.

Farebox recovery ratios differ across transit modes. According to the APTA 2020 Public Transportation Fact Book, rail services generally have higher farebox recovery rates than bus services in the United States, where the highest level of average revenue per unlinked passenger trip is generated by commuter rail and commuter bus, the modes that represent the longer trip lengths for passengers.[42] 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 Figure 5, Metrorail farebox recovery was 34.9% in FY 2020 and Metrobus farebox recovery was 11.8% in FY 2020.

Figure 5: Metrorail and Metrobus Farebox Recovery



*In FY 2020 Metrorail and Metrobus ridership, service and revenue were significantly impacted by the COVID-19 pandemic.

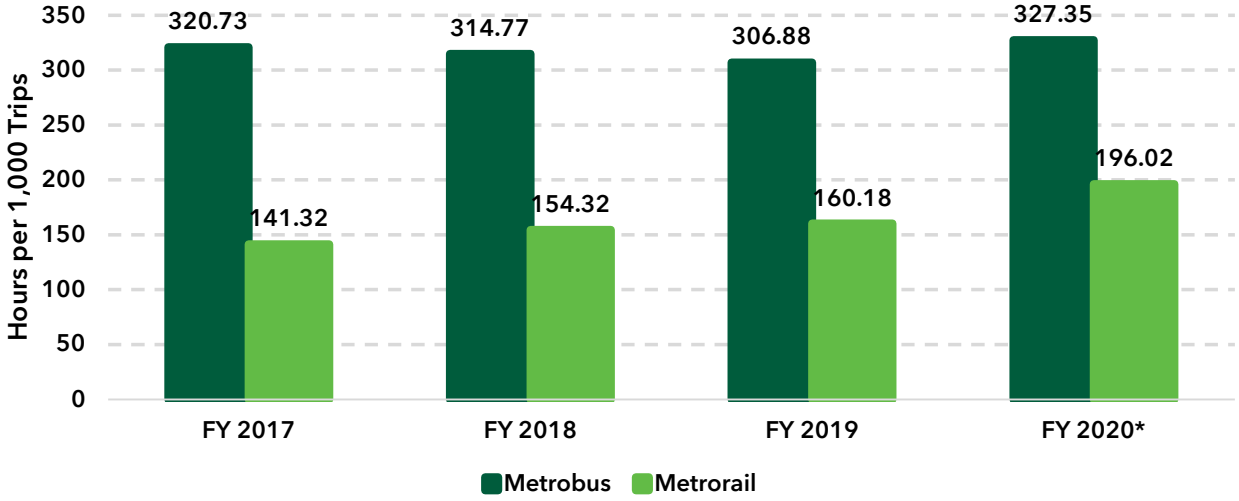
Source: WMATA NTD[43]

4.2 Metrorail and Metrobus Service Per Rider

Service per rider indicates the number of railcar or bus service hours offered per 10,000 passenger trips. This number 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 Figure 6, Metrorail service per rider was 196.02 hours per 10,000 trips in FY 2020 and Metrobus service per rider was 327.35 hours per 10,000 in FY 2020.

Figure 6: Metrorail and Metrobus Service per Rider



*In FY 2020 Metrorail and Metrobus ridership, service and revenue were significantly impacted by the COVID-19 pandemic.

Source: WMATA NTD[44]

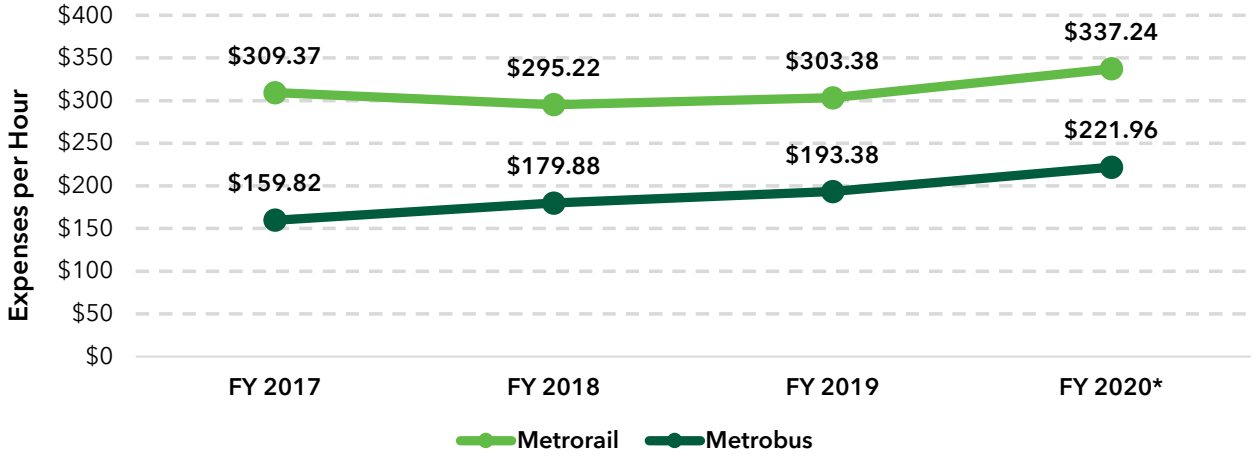
4.3 Cost Per Metrorail and Metrobus Service Hour

The cost per Metrorail service hour is the average cost 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 because they use larger vehicles over shorter service miles.[45]

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 Figure 7, the cost per Metrorail service hour was $337.24 in FY 2020 and Metrobus service hour was $221.96 in FY 2020.

Figure 7: Metrorail and Metrobus Cost per Service Hour



*In FY 2020 Metrorail and Metrobus ridership, service and revenue were significantly impacted by the COVID-19 pandemic.

Source: WMATA NTD[46]

5. Metrorail and 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)

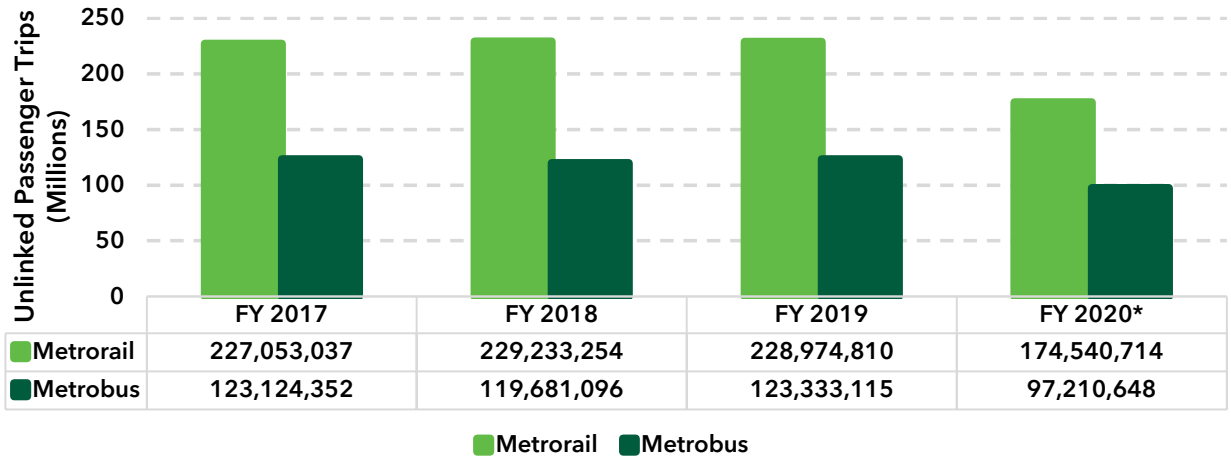
The meaning and significance of these two ridership measures are clarified in Sections 5.1 and 5.2. For Metrobus, data presented includes both services that are directly operated by WMATA and those which are operated by a contracted provider.[47] It is also important to note that due to robust auditing and review processes, NTD data is typically released at least one year or more after the fiscal year it represents. Data provided in this section is from the full FY 2020 (July 1, 2019 to June 30, 2020) and reflects impacts on ridership due to the COVID-19 pandemic and implementation of safety protocols by WMATA beginning in March 2020.

5.1 Metrorail and Metrobus Unlinked Passenger Trips

Unlinked passenger trips (UPT) indicate the number of passengers boarding vehicles and demonstrates the overall number of passengers passing through the overall Metro system. A higher UPT reflects greater use of transit services. This section provides FY 2020 UPT data for Metrorail and Metrobus. The official NTD definition for this ridership metric is included in the Appendix.

In FY 2020 total ridership for Metrorail was 174,540,714 unlinked passenger trips and Metrobus was 97,210,648 unlinked passenger trips, as shown in Figure 8.

Figure 8: Metrorail and Metrobus Ridership, UPT



*In FY 2020 Metrorail and Metrobus ridership, service, and revenue were significantly impacted by the COVID-19 pandemic.

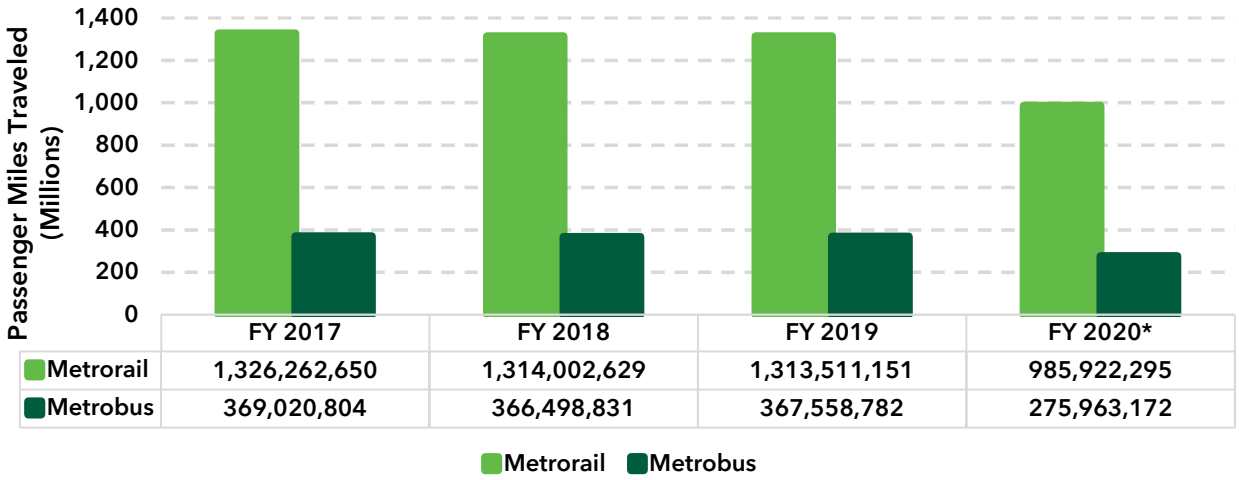
Source: WMATA NTD[48]

5.2 Metrorail and Metrobus 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.

In FY 2020 the total passenger miles traveled for Metrorail was 985,922,295 and Metrobus was 275,963,172 as shown in Figure 9.

Figure 9: Metrobus and Metrorail Ridership, PMT



	FY 2017	FY 2018	FY 2019	FY 2020*
Metrorail	1,326,262,650	1,314,002,629	1,313,511,151	985,922,295
Metrobus	369,020,804	366,498,831	367,558,782	275,963,172

*In FY 2020 Metrorail and Metrobus ridership, service and revenue were significantly impacted by the COVID-19 pandemic.

Source: WMATA NTD[49]

Appendix

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

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.[50]

2. For metrics without an NTD definition, a definition is taken from WMATA's Metro Performance Report (MPR).[51] 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."

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[52]
The average cost to operate one vehicle/passenger car for one hour of passenger service. Calculated for each mode by taking the total operating expenses and dividing by total vehicle revenue hours.

Deadhead (Miles and Hours)
The miles and hours that a vehicle travels when out of revenue service. Deadhead includes leaving or returning to the garage or yard facility, changing routes and when there is no expectation of carrying revenue passengers. Deadhead does not include charter service, school bus service, operator training or maintenance training.

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

Failure, Metrobus
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.)
- 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
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.

Farebox Recovery Ratio[53]
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 received directly from passengers, paid either in cash or through pre-paid tickets, passes, etc. It includes donations from those passengers who donate money on the vehicle. It includes the reduced fares paid by passengers in a user-side subsidy arrangement.

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.

Fringe Benefits
The payments or accruals to others (insurance companies, governments, etc.) on behalf of an employee and payments and accruals direct 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.

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

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

Linked Passenger Trips[54]
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.

Labor (Cost)[55]
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.

Major Event Report (S&S-40) [56]
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[57]
The average number of miles traveled before a railcar experiences a failure that leads to a delay of four or more minutes. 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[58]
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.*

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.

Non-Major Monthly Summary (S&S-50)[59]
The Non-Major Monthly Summary Report captures monthly summary information on minor fires and other less severe safety events that are not reportable as Major Events.

Non-Labor Costs
The costs associated with operating expenses including fuel/lube, tires, tubes, utilities, casualty/liability costs, taxes and other materials.[60]

On-Time Performance (Metrobus)[61]
Bus on-time performance (OTP) communicates the reliability of bus service, which is a key driver of customer satisfaction and ridership. For schedule-based routes, OTP measures adherence to the published route schedule for delivered service. For headway-based routes, OTP measures the adherence to headways, or the time customers wait between buses. Headway-based routes include routes 70, 79, X2, 90, 92, 16Y and Metroway.

Metrobus measured OTP using schedule-based methodology until FY 2020. After a pilot in FY 2019, OTP was measured using a blended schedule- and headway-based methodology beginning in FY 2020.

Factors that can affect OTP include traffic congestion, detours, inclement weather, scheduling, vehicle reliability, operational behavior or delays caused by passengers. Measurements are calculated as follows:

Percentage of bus service delivered on-time

Schedule-based routes = Number of time points delivered on time based on a window of 2 minutes early and 7 minutes late ÷ Total number of time points delivered

Headway-based routes = Number of time points delivered within the scheduled headway + 3 minutes ÷ Total number of time points delivered

Fiscal Year	Methodology	Data Availability
FY 2018	Schedule-based OTP*	Available for entire fiscal year
FY 2019	Headway-based OTP**	Not available due to quality errors
FY 2020	Schedule- and Headway-based OTP	Available from July 1, 2019 until March 15, 2020, as the beginning of the pandemic significantly reduced service
FY 2021	Schedule- and Headway-based OTP	Available for entire fiscal year

*In FY 2018 Metrobus on-time performance data was schedule based and reported on the number of bus vehicles arriving at a timepoint at or close to the scheduled arrival time, divided by the total number of vehicles arriving at timepoint, over a period (in this case, one year).
** WMATA piloted a new calculation for Metrobus on-time performance that introduced a headway-based measure for several Metrobus routes and modified the schedule-based OTP to include all timepoints (this previously had excluded all last timepoints).

On-Time Performance (Metrorail)[62]
Metrorail customer OTP measures the percentage of customers who complete their journey within the maximum amount of time it should take per WMATA service standards. Actual journey time is calculated from the time a customer taps a SmarTrip card to enter the system, to the time when a SmarTrip card is tapped to exit. Factors that can affect OTP 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. Measurements are calculated as follows:

Number of station stops delivered within the scheduled headway plus 2 minutes during rush (AM/PM) service ÷ Total station stops delivered.

Number of station stops delivered up to 150% of the scheduled headway during non-rush (midday and evening) ÷ Total station stops delivered.

The peak and off-peak hours are:
1. **Peak periods**: AM rush (approximately 5-9:30 a.m.) and PM rush (approximately 3-7 p.m.)
2. **Off-peak periods**: Midday (approximately 930 a.m.-3 p.m.) and Night (approximately 7:00 p.m. to close)

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.[63]

Passenger Miles Traveled (PMT)[64]
The cumulative sum of the distances ridden by each passenger.

Ridership
Ridership is a measure of total service consumed and an indicator of value to the region. Drivers of this indicator include service quality and accessibility.

Passenger trips are defined as follows:

- Metrorail reports passenger trips. A 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.
- Metrobus reports passenger boardings. A passenger boarding is counted via the onboard Automatic Passenger Counter (APC) when a customer boards a Metrobus. In an example where a customer transfers between two Metrobuses to complete their travel two trips are counted. Metrobus totals also include shuttles to accommodate rail station shutdowns and other track work.

Revenue Service (Hours)
The time when a vehicle is available to the public and there is an expectation of carrying passengers. These passengers either directly, pay fares, are subsidized by public policy, or provide payment through some contractual arrangement. Vehicles operated in fare-free service are considered in revenue service. Revenue service includes layover and recovery time and excludes deadhead,[65] vehicle maintenance testing, school bus service, and charter service.

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[66]
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. The metric is calculated as: (*Total Vehicle Revenue Hours ÷ Number of Unlinked Trips)* × *10,000*.

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

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.

Passenger trips are defined as follows:[67]

- Metrorail reports passenger trips. A 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 two unlinked passenger trips are counted.
- Metrobus reports passenger boardings. A passenger boarding is counted via the onboard Automatic Passenger Counter (APC) when a customer boards a Metrobus. In an example where a customer transfers between two Metrobuses to complete their travel, two trips are counted. Metrobus totals also include shuttles to accommodate rail station shutdowns and other track work.

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. Vehicle revenue hours include layover and recovery time and exclude deadhead, operator training, vehicle maintenance testing, and school bus and charter services.

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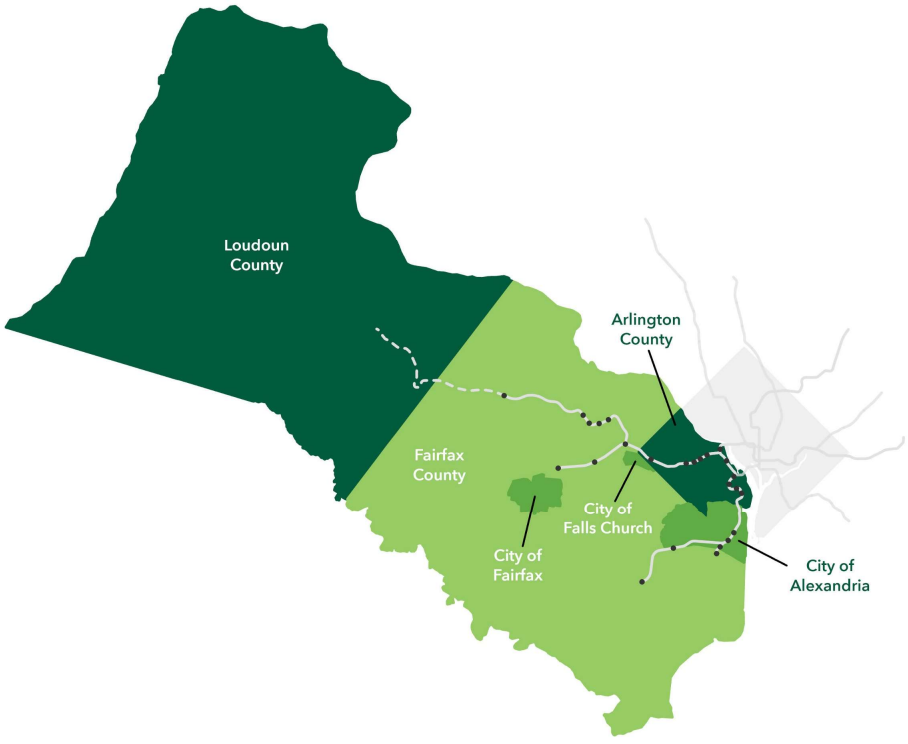
About NVTC

The Northern Virginia Transportation Commission (NVTC) was established to manage the Northern Virginia Transportation District and 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 through its appointments to the panel. The WMATA Board determines the authority's policy and provides oversight for funding, operations, and the expansions of transit facilities.

NVTC also manages more than $177 million in state assistance to WMATA on behalf of its jurisdictions. NVTC ensures that all its jurisdictions' voices are represented on the WMATA Board, coordinates regional transit efforts that directly affect systems serving Northern Virginia and engages in regional transportation planning, data analysis, and reporting, which provides direct benefits to WMATA and the related Northern Virginia transit network.

NVTC also administers the Commuter Choice Program, which invests toll revenue into multi-modal and transit projects along the I-66 Inside the Beltway and I-395/95 corridors, and co-owns the Virginia Railway Express (VRE), which provides commuter rail service connecting Northern Virginia to the District of Columbia.

The Northern Virginia Transportation District



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