FY 2020 – FY 2025
ALEXANDRIA TRANSIT COMPANY (DASH)
TRANSIT DEVELOPMENT PLAN

DRAFT – March 14, 2019

FY 2020 - FY 2025 ATC TRANSIT DEVELOPMENT PLAN
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1.0 / Executive Summary

This document represents the FY 2020 – FY 2025 Transit Development Plan (TDP) for the Alexandria Transit Company (ATC). The Alexandria Transit Company is responsible for the management, operation and maintenance of the DASH bus system in Alexandria, Virginia.

The Transit Development Plan (TDP) provides a comprehensive vision of future service development, fare adjustments, and capital investments based on recommendations from the General Manager, ATC Board of Directors and DASH staff. More specifically, it evaluates current DASH system performance, outlines projected service levels for the fiscally-constrained FY 2020 operating budget, and provides fiscally-unconstrained guidance on future service changes and capital improvements for the remaining five years of the six-year plan cycle (FY 2021 – FY 2025). The TDP is updated each year by DASH staff and is subject to annual review, amendment, and adoption by the ATC Board of Directors. The document also serves as a resource for the city staff as they consider future ATC requests for financial assistance.

The FY 2020 Transit Development Plan addresses the period beginning July 1, 2019 and ending June 30, 2025. The document has been prepared in accordance with board-adopted procedures, and is divided into four main sections – System Overview (Section 3), System Performance (Section 4), Service & Fare Change Recommendations (Section 5), and Capital Budget (Section 6).

The key findings and recommendations of these four sections are summarized below:

1.1 / System Performance

- In FY 2018, DASH operated over 215,000 revenue hours of service, up 1.5 percent from FY 2017.

- DASH recorded nearly 3.9 million boardings in FY 2018, a 1.9 percent decrease from FY 2017. Although this represents a ridership loss, the ridership drop for each of the two preceding years was four percent per year. For comparison purposes, Fairfax Connector, Arlington Transit, Fairfax CUE, Loudoun County Transit and PRTC/Omniride each experienced declines of between 4 percent and 13 percent from FY 2017 to FY 2018, so DASH experience the least decline of all bus agencies in Northern Virginia during that period.

- The FY 2017 Operating Ratio was 32.2 percent, or 1.6 percent lower than FY 2017.

- DASH On-Time Performance was 82.1% in CY 2018. In November 2017, DASH began calculating OTP with a new methodology based on CAD/AVL technology which is expected to yield more accurate OTP statistics. FY 2019 will be the first full fiscal year with data from the new method.

1.2 / FY 2020 Service & Fare Change Recommendations

- At the direction of the ATC Board of Directors, the following FY 2020 fare changes are planned:
    - Increase base fare from $1.75 to $2.00, effective September 1, 2019.
    - Increase cost of monthly DASH Pass from $45 to $50, effective September 1, 2019.

- Due to city subsidy funding constraints, no major service improvements are planned in FY 2020, other than those which are tied to I-395 Commute Choice Program funding.

- Excluding the I-395 Commuter Choice program improvements and additional service provided in response to WMATA's Summer 2019 Platform Improvement Project, DASH projects that FY 2020 service levels for regular DASH routes and the King Street Trolley will remain flat as compared to FY 2019 (237,000 annual platform hours).
- The FY19 Projected Operating Ratio of 31.7% is down from 33.7% in the FY 2019 adopted budget. This reflects a projected passenger revenue deficit in FY19 driven by declining ridership, the federal government shutdown in January, the King Street Metro Access Improvement Project, and expected effects of the Summer 2019 Metro Platform Improvement Project.

- DASH has agreed to operate shuttle service during the first phase of WMATA's Platform Improvement Project, which will result in a shutdown of all Metrorail stations south of National Airport from Memorial Day to Labor Day 2019. DASH will be operating the Blue Line Shuttle seven days per week during this shutdown period, and will provide enhanced service on the AT3, AT4 and King Street Trolley on weekdays to help mitigate the impact of the closure.

- As part of the inaugural I-395 Commuter Choice program for disbursement of toll revenues from the new I-395 Express Lanes, DASH will be submitting applications to enhance service on several DASH routes that provide local and/or express bus service along the I-395 corridor. The selected improvements will be compatible with the anticipated recommendations from the Alexandria Transit Vision Plan and will likely serve as a precursor to the West End Transitway. If selected, DASH would be able to implement the proposed service enhancements in October 2019.

1.3 / FY 2021 – FY 2025 Service & Fare Change Recommendations

- Based on the future recommendations of the Alexandria Transit Vision (ATV) Plan, DASH will implement a set of comprehensive service adjustments beginning in FY 2021. The ATV study kicked off in Spring 2018 and is expected to be completed by mid-2019. Findings and recommendations will be finalized by Fall 2019 and will be implemented as part of the FY 2021 Transit Development Plan, which takes effect July 1, 2020. As noted above, some initial weekday frequency improvements that align with anticipated ATV recommendations may be implemented as early as October 2019 if DASH is awarded funding from the I-395 Commuter Choice inaugural program.

- No additional future fare changes for FY 2021 or beyond are being considered at this time.

1.4 / ATC Capital Program Summary

- Over the last 12 months, DASH has purchased and received 27 new clean diesel buses to replace older diesel buses that had reached the end of their useful life.

- DASH will receive $3.5 million in FY 2020 for replacement buses as part of the City of Alexandria's FY 2020 CIP budget cycle. The total approved FY 2020 – FY 2029 CIP award for replacement bus purchases was $21 million.

- Beginning in FY 2018, DASH changed its practice for replacement buses and now purchases clean diesel buses instead of hybrid vehicles to meets its fleet replacement needs. This will

enable DASH to achieve State of Good Repair (SGR), maintain an acceptable spare ratio, and limit the number of buses that remain in revenue service beyond their useful 12-year life cycle. It will also ensure that DASH has a reliable core fleet of buses during its upcoming transition to less proven, zero-emission propulsion technology.

- DASH is planning to purchase 14 buses in FY 2020, including six electric buses through the VW Mitigation Trust program and eight clean diesel buses. If DASH is awarded VW funding, the six electric buses will arrive no later than Spring 2021 and replace six older diesel buses. The eight clean diesel buses will be purchased through DRPT's minor enhancement program and will allow DASH to improve its spare ratio to industry standards by late 2020.

- Additional FY 2020 – FY 2029 CIP funds are allocated for hybrid powertrain replacement, the DASH Facility Expansion project, electronic fare payment, and other DASH technology needs.

2.0 / TDP Background

The Transit Development Plan is prepared each year to document and present the General Manager's recommendations relating to service, fares and the capital budget for the upcoming fiscal year. The plan also serves as a planning and budgetary road map for the following five years. To this end, the TDP provides an evaluation of the existing DASH bus service and a corresponding outline for future service development and capital investment. The plan aligns with the budgetary assumptions for the upcoming fiscal year, and will be used as a starting point for budget discussions in future fiscal years.

2.1 / Purpose & Format

Based on feedback from the ATC Board of Directors, City staff and DASH management, the format of the FY 2019 - FY 2024 Transit Development Plan was shifted to focus on service planning, fares, and capital program considerations, and less on the historic and budgetary narrative that had been included in previous TDP documents.

The newly-formatted Transit Development Plan (TDP) provides a comprehensive vision of future service development, fare adjustments, and capital investments based on recommendations from the General Manager, ATC Board of Directors and DASH staff. More specifically, it evaluates current DASH system performance, outlines projected service levels for the fiscally-constrained FY 2020 operating budget, and provides fiscally-unconstrained guidance on future service changes and capital improvements for the remaining five years of the six-year plan cycle (FY 2021 – FY 2025). The TDP is updated each year by DASH staff and is subject to annual review, amendment, and adoption by the ATC Board of Directors. The document also serves as a resource for the city staff as they consider future ATC requests for financial assistance

2.2 / Process & Timeline

The TDP approval process is designed to run in parallel with the City of Alexandria's annual budget timeline. As shown in Table 2-1, the basic TDP assumptions are developed by DASH management in the late fall and early winter. A preliminary draft of the TDP is typically submitted to the Board of Directors and released for public review in March. This release marks the beginning of a month-long public comment period that culminates with a formal public hearing at the April meeting of the ATC Board. The public comment period includes multiple community meetings, online engagement and the opportunity for comments to be submitted via phone, email, or in person at the Board of Directors meeting in April. DASH staff reviews all feedback and modifies the document as needed to incorporate feedback, and align with the final city budget. The final ATC Transit Development Plan is then reviewed and adopted by the ATC Board of Directors in May so that the plan may be implemented for the subsequent fiscal year on July 1st.

Table 2 – 1 / Annual TDP Timeline

| Month	ATC/DASH Activity	City Activity
July	No Actions	No Actions
August	No Actions	No Actions
September	DASH Finance Department Develops and Distributes Budget Process to internal staff	(TYP) City Develops Budget Process
October	Budget and TDP Assumptions developed by DASH Staff	(TYP) City Manager releases Priorities and Instructions Memorandum
November	Budget Assumptions and Scenarios presented to DASH Board inclusive of Council Priorities and City Manager's Instructions	DASH Assumptions and Reduction Actions (if required) submitted to City Manager
December	Preliminary Budget submitted to DASH Board for Approval	Budget Request submitted to City Manager using Preliminary Budget
January	DASH Staff begin draft TDP (in years 2-6 this is the TDP update) – No Board Action this Month	City Manager Develops Budget and holds meetings with Department Heads
February	No actions	City Manager Releases Budget and presents to Council
March	Draft TDP is presented to Board and released for public comment	City Budget Hearings
April	DASH Board holds Draft TDP Public Hearing (in years 2-6, updates are provided for public comment)	City Budget Hearings ongoing
May	DASH Board Adopts Final Budget and TDP	City Adopts Budget
June	No Actions	No Actions

2.3 / Alexandria Transit Vision Plan

The ATV Plan is an ambitious, consultant-led study that takes a non-traditional, data-driven approach to re-designing the city's transit network from scratch. The final product will be a new, fiscally-unconstrained bus network to be implemented by 2030, which more accurately reflects current and future transit demand, and is better aligned with community transit priorities. A near-term, fiscally-constrained implementation scenario will also be developed as a first step towards the ultimate transit vision. The near-term implementation scenario will be designed with a fiscally-constrained approach and will be implemented as early as July 2020. Consequently, the service, fare, and capital improvement recommendations for next year's FY 2021 – FY 2025 Transit Development Plan will be guided almost exclusively by the findings and recommendations in the Alexandria Transit Vision (ATV) Plan.

The first round of public outreach for the Alexandria Transit Vision Plan focused on key transit choices and was conducted in September 2018. The outreach campaign included public meetings, pop-up events, leadership briefings, stakeholder workshops, technical advisory committees, online surveys and extensive digital outreach using email and social media.   The results of this outreach indicated a strong preference on the part of the community, stakeholders and city officials towards a more ridership-centric network and a willingness to walk further and transfer between buses, if it meant better access to high-frequency, all-day bus service. Although the community expressed a strong desire towards ridership goals, some also expressed concerns for the impact of service reductions in low-density areas on persons with limited mobility that may not be able to walk further to get to the nearest bus stop.

With this guidance in mind, the project team developed two draft network concepts that represented potential directions for the future transit network – one network called the "Coverage" network represent a moderate shift towards a ridership-centric network, while the second network, the "Ridership" network outlines a more dramatic shift towards the goal of ridership maximization. After sharing these two concepts with the community, stakeholders and key city officials in March, the project team will design the final network in April based on the feedback that is received. One final round of outreach will be conducted in Summer/Fall 2019 before the final plan is adopted.
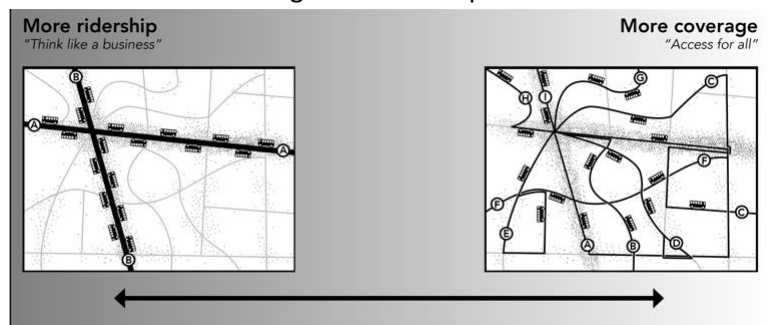
Since the final ATV plan will not be determined until after the FY 2020-FY2025 Transit Development Plan is adopted, the proposed service and fare changes for FY 2020 – FY 2025 contained in this TDP will be relatively minor and open-ended in deference to the forthcoming ATV Plan. Several potential service improvements to the AT 1, AT 2 and AT-9, which align with anticipated ATV recommendations, are being pursued through I-395 Commuter Choice program funding and are discussed in Section 5.

3.0 / System Summary

DASH operates traditional fixed-route bus service on eleven regular bus routes, and the King Street Trolley. The primary DASH service area covers approximately 15 square miles and generally aligns with the jurisdictional boundaries of the City of Alexandria. A map of the DASH bus system is included as Figure 3-1. An inset map depicting bus service in Old Town Alexandria is shown as Figure 3-2.

3.1 / Service Area

The majority of DASH service operates within the City of Alexandria, however, two routes – the AT-3 and AT-4 – also provide service along Interstate 395 between Alexandria and the Pentagon during weekday peak hours. As shown in Figures 3-1 and 3-2, the DASH bus system design follows a modified hub-and-spoke network design model with Old Town as the "hub", and the major east-west arterials (King Street, Seminary Road, Duke Street, and Eisenhower Avenue) serving as the "spokes". Several "crosstown routes" also provide connections between outlying areas and major trip generators on the West End and northern Alexandria. All but one of the twelve DASH routes connect to at least one of the four Metrorail Stations within the City of Alexandria.

Based on a geospatial analysis of the DASH network, approximately 145,000 Alexandria residents (96% of all residents) are within short walking distance (¼ mile) of a DASH bus stop. Roughly 80,000 jobs (90% of all jobs) in or around Alexandria are within short walking distance of a DASH bus stop.

3.2 / Routes

The DASH bus system consists of 11 regular bus routes and the King Street Trolley. The basic characteristics of each route are summarized in Table 3-1. All twelve bus routes operate on weekdays, however, only eight routes run on Saturday, and only seven routes are available on Sundays. On most routes, weekday service runs from roughly 6:00 AM to 10:00 PM, Saturday service from 7:00 AM to 10:00 PM, and Sunday service from 8:00 AM to 8:00 PM. Weekday peak service for most routes runs every 15-30 minutes. Weekday off-peak service typically runs every 30-60 minutes during mid-days and evenings. Of the eight Saturday routes, four run with minimum 30-minute headways, while on Sundays, six of the seven routes only run once every hour.

DASH also operates the iconic King Street Trolley, a free service running between the King Street Metro and the Old Town Waterfront. The trolleys run every 10-15 minutes, 365 days per year. Daily service starts at 10:30 AM and typically ends at 10:30 PM, with extended late-night service on Thursdays, Fridays, and Saturdays.

Additional information on the destinations, service levels and operating characteristics for specific DASH routes is provided in Table 3-1.
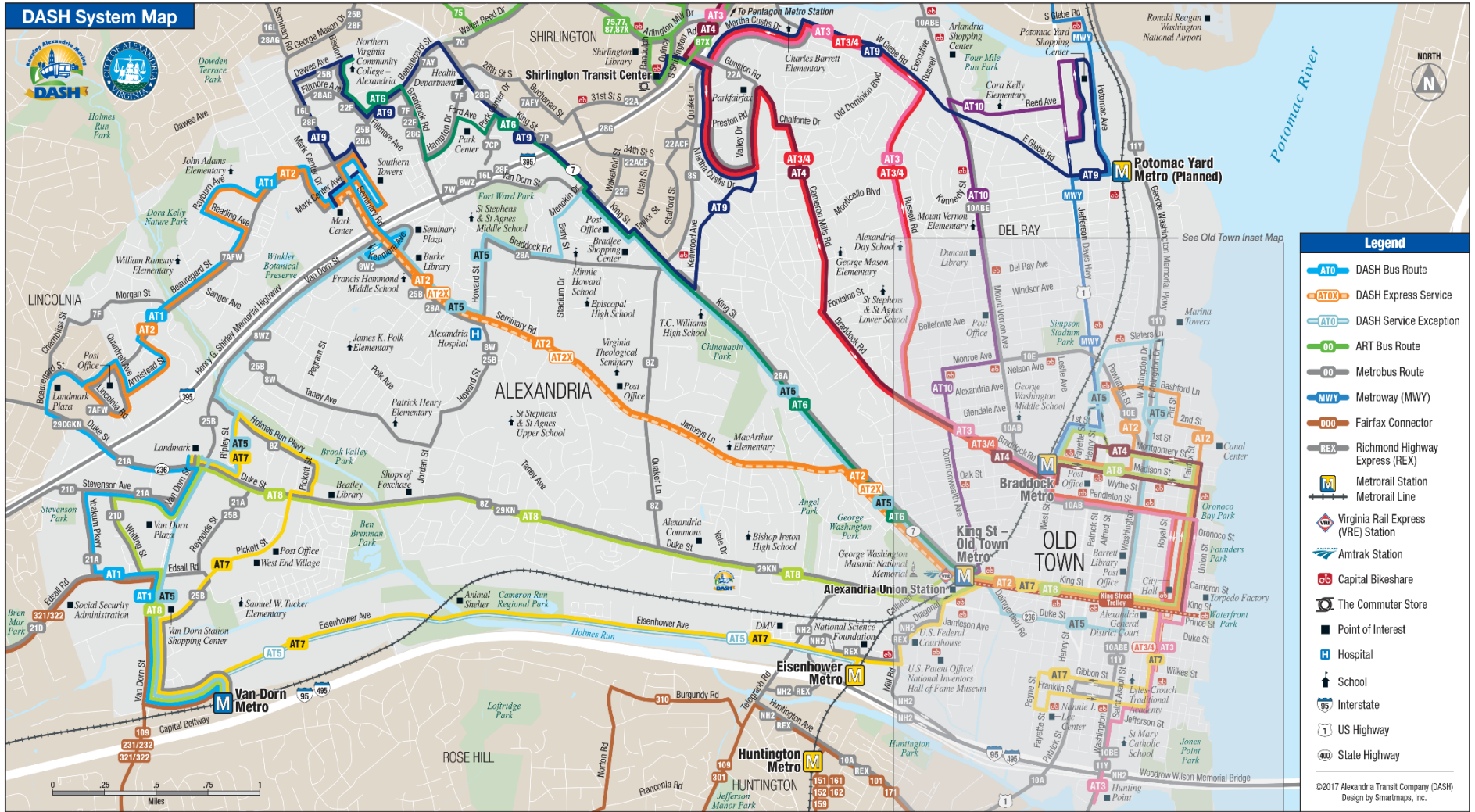
Figure 3 – 1 / DASH System Map

DASH System Map

Figure 3 -2 / Old Town Alexandria Inset Map

Table 3-1 / DASH Service Characteristics by Route

Route	Route Description	Span/Frequency								Service Hour Breakdown (October 2018)			Peak Vehicle Req's (Approx)			Avg. Daily Boardings (Oct. 2018)			Daily Rev. Hours (Oct. 2018)		
		Weekday				Saturday		Sunday													
		Span	Peak	Off-Peak	Night	Span	Freq.	Span	Freq.	Rev Hrs	DH Hrs	LO Hrs	Wky	Sat	Sun	Wky	Sat	Sun	Wky	Sat	Sun
AT1	**Seminary Plaza to Van Dorn Metro** via Beauregard & Duke	6am - 10pm	15	30	60	7am - 10pm	30	8am - 8pm	60	95.4	6.33	23.2	8	3.5	2	1,736	737	493	95.4	37.4	22.1
AT2 (2X)	**Lincolnia to Braddock Road Metro** via Seminary, King Street Metro & Old Town (2X - Mark Center Express)	6am - 10pm (6 - 9am & 3 - 6pm)	20/30 (10/20)	30	60	8am - 11pm	60	8am - 8pm	60	86.13 (21.94)	8.16 (1.75)	15.72 (7.17)	12	3	2.5	1,567	425	475	86.1	35.3	28.1
AT3	**Hunting Point to Pentagon Metro** via Old Town, Braddock, Russell, Glebe and I-395	6 - 9am & 4 - 8pm	20	-	-	-	-	-	-	37.01	5.12	5.64	5	-	-	742	-	-	37.0	-	-
AT4	**City Hall to Pentagon Metro** via Old Town, Braddock Road Metro, Cameron Mills, and I-395	6 - 9am & 4 - 7:30pm	20	-	-	-	-	-	-	36.87	5.08	8.52	5	-	-	558	-	-	36.9	-	-
AT3/4	**City Hall to Parkfairfax Loop** via Old Town, Braddock Road Metro, Braddock, Glebe & Russell	10:30am - 3pm & 8:30 - 10:30pm	-	60	60	9am - 8pm	60	9am - 6pm	60	5.67	0.25	2.07	0	1	1	58	58	53	5.7	11.9	10.2
AT5	**Van Dorn Metro to Braddock Road Metro** via Landmark Mall, Van Dorn, King & Old Town	6am - 10:30pm	20/30	30	60	7:30am - 10:30pm	30	8am - 8pm	60	88.62	5	14.7	7	6	2.5	1,673	961	399	88.6	92.5	36.3
AT6	**King Street Metro to NVCC** via King	6am - 10pm	15	30	30	-	-	-	-	52.93	4.3	13.23	5	-	-	1,004	-	-	52.9	-	-
AT7	**Landmark Mall to Lee Center** via Van Dorn Metro, Eisenhower Metro, King Street Metro & Old Town	6am - 10pm	30	60	60	-	-	-	-	57.42	3.4	11.55	5	-	-	696	-	-	57.4	-	-
AT8	**Braddock Road Metro to Van Dorn Metro** via Old Town, King Street Metro, Duke & Landmark	5:30 am - 12 am	10/20	30	60	7am - 11:30pm	30	7am - 11pm	20/40	126.85	9.74	31.4	10	3.5	3	2,933	1,311	916	126.9	61.4	50.9
AT9	**Potomac Yard to Mark Center** via Glebe, Shirlington, King & NVCC	7am - 9pm	30	30	60	7:30am - 9:30pm	60	-	-	55.11	2.34	11.55	4	2	-	618	211	-	55.1	30.5	-
AT10	**Potomac Yard to King Street Metro** via Mt. Vernon, Del Ray & Commonwealth	7am - 10pm	30	30	60	7am - 10pm	30	9am - 7pm	60	29.92	2.25	8.75	2	2	1	432	330	139	29.9	29.5	10.8
KST	**King Street Trolley**	10:30/11am - 10:30pm/ 12am	10-15	10-15	10-15	10am - 12am	10-15	10am - 10:15pm	10-15	44.69	2.0	16.31	4/5	4/5	4/5	1,978	3,007	2,400	44.7	54.0	46.1

3.3 / Other Transit Providers

The DASH bus network in Alexandria provides a local complement to the regional transit network. Regional operators that provide service to/from Alexandria include:

- **Metrorail (WMATA).** Metrorail operates heavy rail service to 91 stations throughout the Washington, DC region, carrying roughly 600,000 passengers per weekday. The City of Alexandria is served by the Blue and Yellow lines at four different Metrorail Stations – Braddock Road, King Street, Eisenhower Avenue, and Van Dorn. DASH also provides service to the Pentagon Metro Station during weekday peak periods. The new Potomac Yard Metrorail Station – an in-fill station in northern Alexandria on Potomac Avenue – is slated to open in early 2022.

- **Metrobus (WMATA).** In addition to Metrorail, WMATA also operates a regional bus network that carries about 400,000 passengers per weekday. Metrobus runs 28 routes that provide service within the City of Alexandria. This includes the "Metroway" rapid bus service between Pentagon City and Braddock Road Metro, and the Richmond Highway Express (REX), which provides frequent, limited-stop service from Mount Vernon to Old Town via Route 1.

- **Amtrak/Virginia Railway Express.** Intercity and commuter rail services such as Amtrak and VRE stop at Alexandria Union Station, before crossing the Potomac River into Washington, DC.

- **Private Shuttles.** Several dozen private shuttles operate within the City of Alexandria to provide connections to Metrorail Stations. Examples include the NVCC shuttle, which runs from the Alexandria campus to the King Street Metro, and the Van Dorn Exchange shuttle, which connects the Van Dorn Exchange apartment complex with the Van Dorn Metro.

- **Accessible Service.** Accessible paratransit options are provided through the City of Alexandria's DOT program and the WMATA MetroAccess service.

3.4 / Passenger Facilities

DASH buses provide service to five Metorail Stations, five non-Metrorail transit centers (Landmark Mall, Mark Center, Southern Towers, NVCC-Alexandria and Potomac Yard), and over 700 local bus stops. Roughly 22 percent of these stops are shared by Metrobus or another provider. While DASH does not currently have an updated, comprehensive bus stop inventory, staff estimates that roughly 90 DASH bus stops have shelters, while another 200 have amenities such as benches and/or trash cans. Approximately 100 stops (14 percent) have route schedules mounted on the bus stop poles. The distribution of stop amenities is based primarily upon daily ridership, with shelters, benches and trash cans generally installed at any stop with over 40 daily boardings.

In 2018, DASH began installing real-time bus arrival information kiosks and tablets at various high-ridership locations throughout the city. Major kiosks have been installed at City Hall, Southern Towers, NVCC-Alexandria and NSF with additional screens planned for the King Street Metro and Mark Center Transit Center. DASH has also worked with WMATA to install solar-powered real-time tablets similar to the one pictured at over 20 bus stops throughout the service area.

All DASH bus stops that have been installed or updated since 2006 are compliant with ADA design standards for individuals using wheelchair or other mobility devices. DASH also coordinates closely with city staff during the site plan review process to ensure any proposed developments include adequate considerations for existing and future bus stops.

3.5 / Bus Fleet

DASH currently maintains a core bus fleet of 85 vehicles for use in daily revenue service. Roughly 74 vehicles are required during the weekday afternoon peak deployment period, including both trolleys and regular buses. As part of its buildup to the Summer 2019 Metrorail Shutdown, DASH has temporarily established a Contingency Fleet of 38 additional buses. A summary of the active and contingency bus fleets is shown in Table 3-2.

Table 3-2 / DASH Bus Fleet Summary

ACTIVE BUS FLEET

Vehicle ID's	Year	Make	Type	Length	# of Vehicles
91, 93-96, 99	2007	Orion	Diesel	35'	6
200-206	2011	Gillig	Hybrid	35'	7
300-302	2011	Gillig	Hybrid	40'	3
400-404	2011	Gillig (Trolley)	Hybrid	29'	5
207-211	2012	Gillig	Hybrid	35'	5
303-307	2012	Gillig	Hybrid	40'	5
212-216	2014	Gillig	Hybrid	35'	5
308-309	2014	Gillig	Hybrid	40'	2
217-229	2015	Gillig	Hybrid	35'	13
405	2015	Gillig (Trolley)	Hybrid	35'	1
230-233	2017	Gillig	Hybrid	35'	4
310-311	2017	Gillig	Hybrid	40'	2
501-514	2018	Gillig	Clean Diesel	35'	14
515-527	2019	New Flyer	Clean Diesel	35'	13
TOTAL ACTIVE FLEET					**85**

CONTINGENCY BUS FLEET

Vehicle ID's	Year	Make	Type	Length	# of Vehicles
68, 69, 72, 73, 75, 76	2002	Orion	Diesel	35'	6
77-83, 85-90	2005	Orion	Diesel	35'	13
92, 97, 98	2007	Orion	Diesel	35'	3
101-103	2007	Gillig	Diesel	35'	3
601-611	2002-2003	Neoplan (B-Line)	Diesel	60'	11
701-702	2004	Gillig (PRTC)	Diesel	40'	2
TOTAL CONTINGENCY FLEET					**38**
TOTAL FLEET SIZE (ACTIVE + CONTINGENCY)					**123**

In preparation for increased fleet needs associated with the WMATA Summer 2019 Platform Improvement Project, DASH has created a contingency fleet comprised of secondhand buses from other transit providers and DASH buses that were previously scheduled for retirement during FY 2019. Since these are older buses which will only be used during the rail shutdown and will be retired soon thereafter, they are not considered to be part of the active DASH fleet for FY 2020 and beyond.

In order to maintain State of Good Repair, DASH is required to replace each bus once it reaches the end of its 12-year useful life cycle. A more detailed discussion of bus fleet replacement, expansion plans and the "DASH Capital Budget Program" is included in Chapter 6.

3.6 / Fares

The current DASH base fare is $1.75 per trip with a four-hour transfer window. DASH allows free transfers from most other bus providers with SmarTrip, and provides a $0.50 discount for transfers to and from Metrorail. Disabled persons with valid Alexandria DOT or MetroAccess cards may board DASH buses for free. Two routes – the King Street Trolley and the Mark Center Express (AT-2X) – do not require fares as the operating costs are covered by dedicated external subsidies. For frequent riders, DASH also offers the monthly DASH Pass, which costs $45.00 and entitles the cardholder to unlimited rides on DASH buses during the specified month.

DASH continues to accept SmarTrip cards for rapid, automated fare payment. Roughly 80 percent of DASH boardings are made using SmarTrip cards. DASH is working closely with WMATA as they continue to upgrade their fare technologies in the hopes of further increasing passenger convenience and overall operational efficiency.

In May 2019, DASH plans to launch a one-year mobile ticketing pilot program, which will allow customers to purchase their DASH fare products on smartphones using debit cards, credit cards and selected e-wallet platforms. During the pilot period, passengers will be required to show the validation screen on their phone to the operator, but if the pilot is successful, DASH would implement electronic fare validation, which uses a small reader attached to the farebox to validate mobile fare payments. DASH will be the first bus agency in Northern Virginia to pilot a mobile ticketing application and is working closely with NVTC and other agencies so that the tool could expanded to other agencies throughout the region in the future.

In FY 2018, DASH started a new one-year pilot program to allow T.C. Williams High School students to ride for free using their valid student identification cards. This program was extended due to popular demand in FY 2019 and expanded to include three additional schools – Bishop Ireton High School, Episcopal High School, and St. Stephens & St. Agnes School. During the 2018-2019 school year, DASH was also able to introduce Smartrip-enabled Student ID cards at each of the four schools so that students could tap their school-issued ID cards on the farebox to receive their free ride.

3.7 / Funding

DASH service is operated by the Alexandria Transit Company (ATC), which is an independent public service corporation that is owned by the City of Alexandria. The City provides extensive input and guidance via the Transit Division of the city's Department of Transportation & Environmental Services. City staff play an integral role in supporting the DASH annual budget request and managing a wide

variety of state and regional grant programs.

The majority of annual DASH operating funds comes from an operating subsidy that is allocated each year from the City of Alexandria's General Fund. The City also provides funding for operations through the Transportation Improvement Program (TIP) and for capital investments through the biennial Capital Improvement Program (CIP) process.

Additional external sources of DASH funding include the Virginia Department of Rail and Public Transit (DRPT) and the Northern Virginia Transportation Authority (NVTA).

DASH also relies upon subsides to operate specific services such as the free King Street Trolley for the City of Alexandria, and the Mark Center Express for the Department of Defense. Additional revenue is also generated by bus charters for both public and private events.

Finally, passenger fare revenues typically cover between 20 and 25 percent of the annual DASH operating costs, and are used to reduce the DASH operating subsidy from the city.

4.0 / System Performance

The overall performance of a bus system is typically measured in terms of service provided (revenue hours), service consumed (ridership), cost efficiency (boardings per revenue hour, operating ratio), and service reliability (on-time performance, missed trips, miles between road calls and customer feedback). Additional metrics such as access and mobility should also be considered. The following sections use FY 2018 data to review DASH service performance at both the system and route levels.

4.1 / Service Provided

In FY 2018, DASH operated just over 215,000 hours of revenue bus service. This represents a 1.5 percent increase over FY 2017 service levels. A graph showing the historic trend in DASH annual revenue hours for the last ten years is shown in Figure 4-1.

**Figure 4-1 / DASH Annual Revenue Hours (FY09-FY18)**
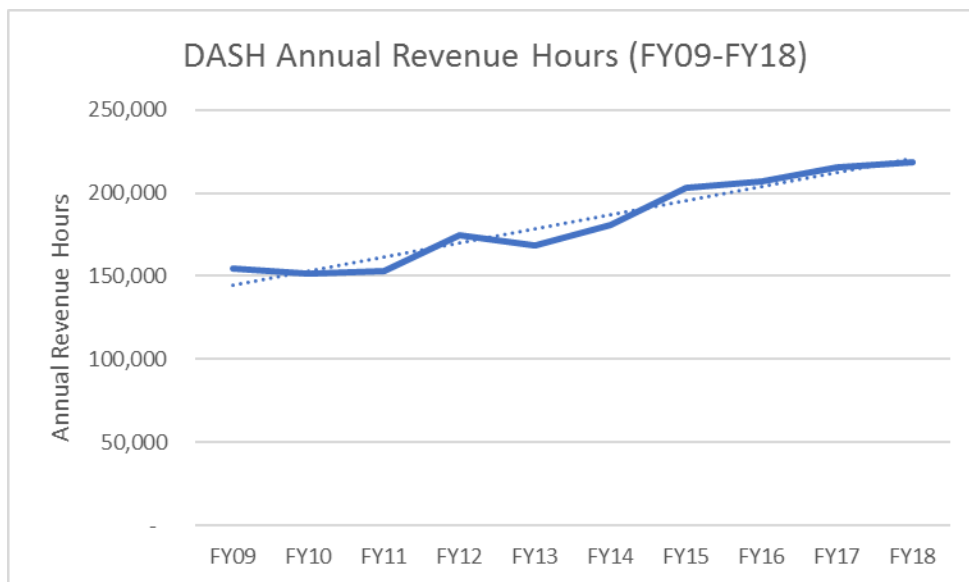
4.2 / System Ridership

As shown in Figure 4-2, annual ridership has fluctuated dramatically over the last decade. After a steep decline between FY 2009 and FY 2011, ridership numbers increased dramatically in FY 2012 and FY 2013. In the last three years, however, ridership has again shown a distinct downward trend. In FY 2018, DASH recorded just under 3.9 million passenger boardings, which was down roughly 1.9 percent from FY 2017, and down 5.7 percent from FY 2016.

In terms of daily boardings in FY 2018, DASH drew an average of 12,800 boardings on weekdays, just over 7,000 boardings on Saturdays, and over 4,700 boardings on Sundays. This translates to an approximately 1.2 percent decrease in weekday boardings from FY 2017. Average Saturday and Sunday boardings were also down by 2-4 percent. Although these numbers represent decreases from FY 2017, the annual rate of ridership decrease is noticeably lower than the percent of riders lost between FY 2016 and FY 2017. For example, weekday ridership decreased by 5.0 percent between FY 2016 and FY 2017, but decreased by only 1.9 percent from FY 2017 to FY 2018.

**Figure 4 -2 / DASH Annual Ridership (FY09-FY18)**
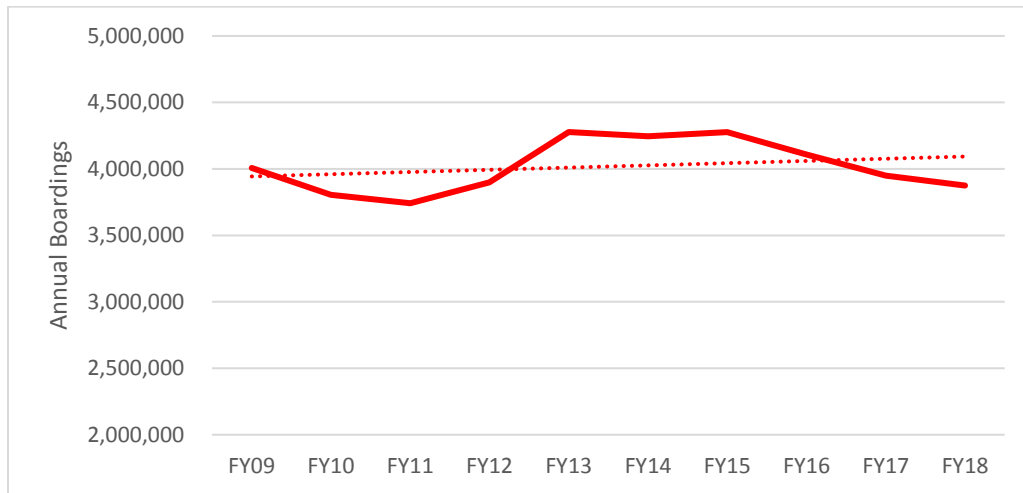
The recent DASH ridership decreases are part of a larger trend affecting agencies throughout the Washington, DC region and across the country. A combination of low fuel prices and the advent of ridesharing services like Uber and Lyft have helped reduce transit mode splits across the country. Within the Washington, DC area, the backbone of the regional transit network, Metrorail, has been disrupted by ongoing service reliability issues and the recent Safetrack program in 2016 and 2017. Given the large percentage of DASH passengers that transfer to the Metrorail system, DASH ridership has also been negatively impacted. Increased telecommuting and changing travel habits have also contributed.

For comparison purposes, the annual ridership statistics for DASH and six other local transit providers from FY 2017 and FY 2018 are included in Figure 4-3. All six providers experienced decreases in bus ridership. Arlington Transit saw the greatest drop (13 percent), while the Fairfax Connector, Fairfax CUE, Loudoun County, and PRTC/Omniride all saw decreases of 4-6 percent. These decreases are all more severe than the two percent decrease experienced by DASH during that same period. Although not shown on the NVTC graph, Metrobus ridership in Virginia declined by roughly 8 percent from FY 2017 to FY 2018. Metrorail ridership in FY 2018 was roughly equal to the preceding year.

In an effort to attract additional ridership, DASH has initiated programs like the "Free Student Rides" program for high school students, the introduction of free rides for Metroaccess and DOT paratransit program participants, and reduced fares for senior riders who use their Senior SmarTrip cards during off-peak periods. The "Free Student Rides" program has been particularly successful, drawing rave reviews and as many as 1,400 student boardings on a typical school day. The free fares for DOT members have also been popular with over 120 boardings on a typical weekday.

Figure 4 -3 / Annual Ridership for Northern Virginia Transit Agencies (FY17 vs. FY18)

Source: NVTC Quarterly Reports
http://www.novatransit.org/resources/ridership-data/
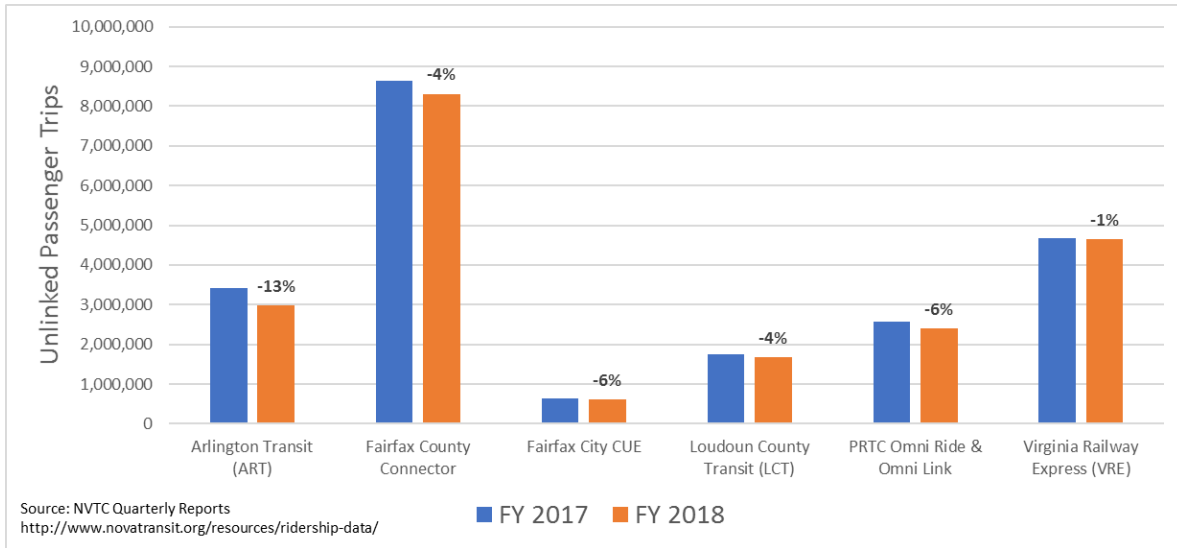
4.3 / Ridership by Route

At the route level, Figure 4-4 shows that while many DASH routes have declined in weekday ridership over the last three years, several have rebounded in FY 2018. The AT-1, AT-2 and AT-5, AT-8 and AT-9 all showed modest improvements as compared to FY 2017. The largest declines were on the AT-4 and the King Street Trolley, which decreased by 7 percent, possible due to the reductions in service hours on weekday mornings.

Weekend ridership has decreased on most DASH routes since FY 2016 but appears to have leveled out over the last year. As shown on Figure 4-5, average Saturday boardings on the AT-9 and AT-10 have increased by 14 and 4 percent, respectively since FY 2017.   King Street Trolley ridership on Saturdays is down by 1 percent from last year.

On Sundays, overall ridership on regular DASH routes is down by roughly four percent. As shown on Figure 4-6, the AT-2 has increased by over 7 percent since FY 2017, but the AT-1, AT-3/4 The AT-5 and AT-8 have dropped by 4-5 percent each. Sunday boardings on the AT-10 are down by 11 percent from last year. King Street Trolley ridership was up by four percent on Sundays.

As noted in the previous subsection, the route-level ridership numbers for the final four months of FY 2017 were underreported due to a farebox configuration error on a set of new buses. As a result, the route-level numbers are estimate to actually be 2-4 percent higher than noted in this section, which may mean that the improvements in year-over-year ridership for FY 2018 may be overstated by these graphs.

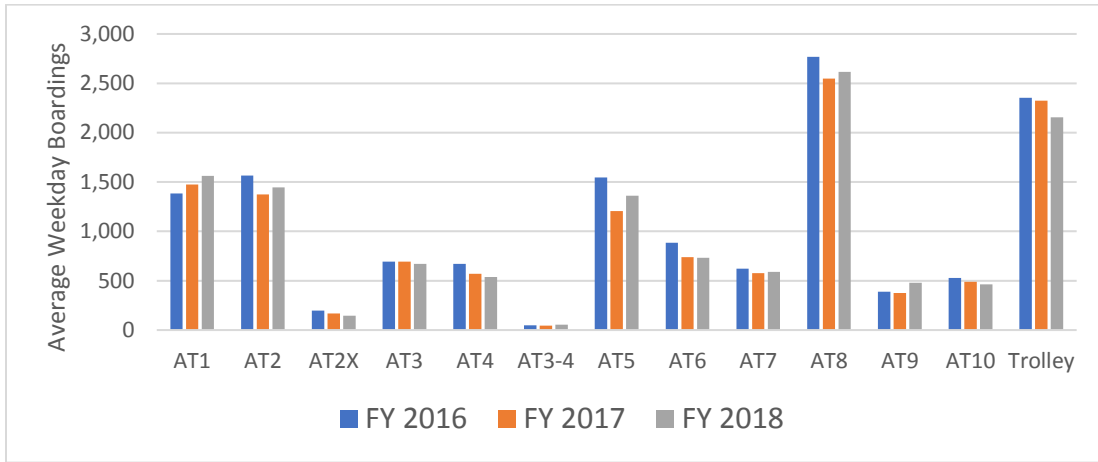**Figure 4-4 / Average WEEKDAY Ridership by Route (FY15-FY17)**

Figure 4-5 / Average SATURDAY Ridership by Route (FY16-FY18)
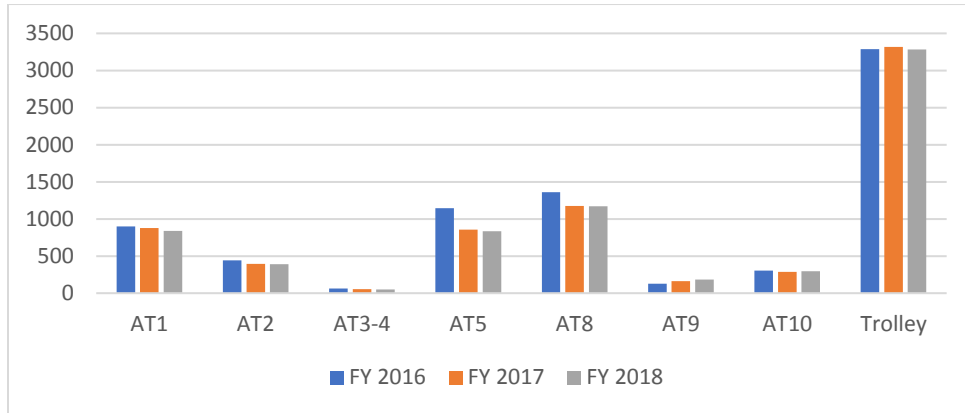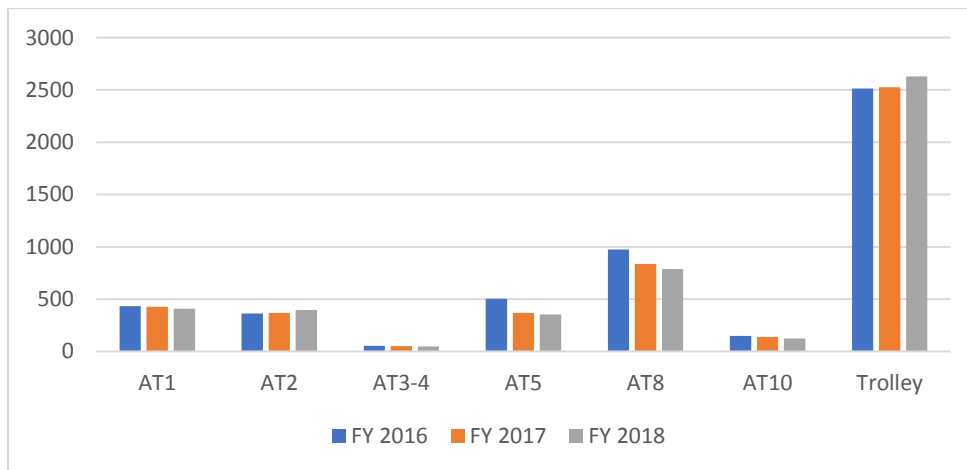

**Figure 4-6 / Average SUNDAY Ridership by Route (FY16-FY18)**

4.4 / Cost Efficiency

Ridership data alone only tells part of the story. In order to determine the cost efficiency of the system, ridership numbers must be compared to revenue hours to determine how efficiently the system and its routes are operating. This metric is typically expressed in boardings per revenue hour. In FY 2018, DASH drew 23.0 weekday boardings per revenue hour, 26.0 Saturday boardings per revenue hour, and 33.9 Sunday boardings per revenue hour. These boardings per revenue numbers decreased slightly from FY 2017, which were roughly 23.1, 27.1, and 34.6 for weekdays, Saturdays and Sundays, respectively.

Route-by-route boardings per revenue hour for weekdays, Saturdays and Sundays in FY 2018 are shown in Figure 4-7. Routes with the highest weekday productivity include the King Street Trolley and the AT-8. The least productive weekday routes are the AT2X and the AT3-4, which both draw five boardings per hour or fewer. On weekends, the AT-1, AT-8 and King Street Trolley maintain an average productivity at or above 15 boardings per revenue hour. The AT-3/4 and AT-9 both operate below 5 boardings per revenue hour on weekends.

Figure 4-7 / Average Boardings per Revenue Hour by Route and Day (FY 2018)
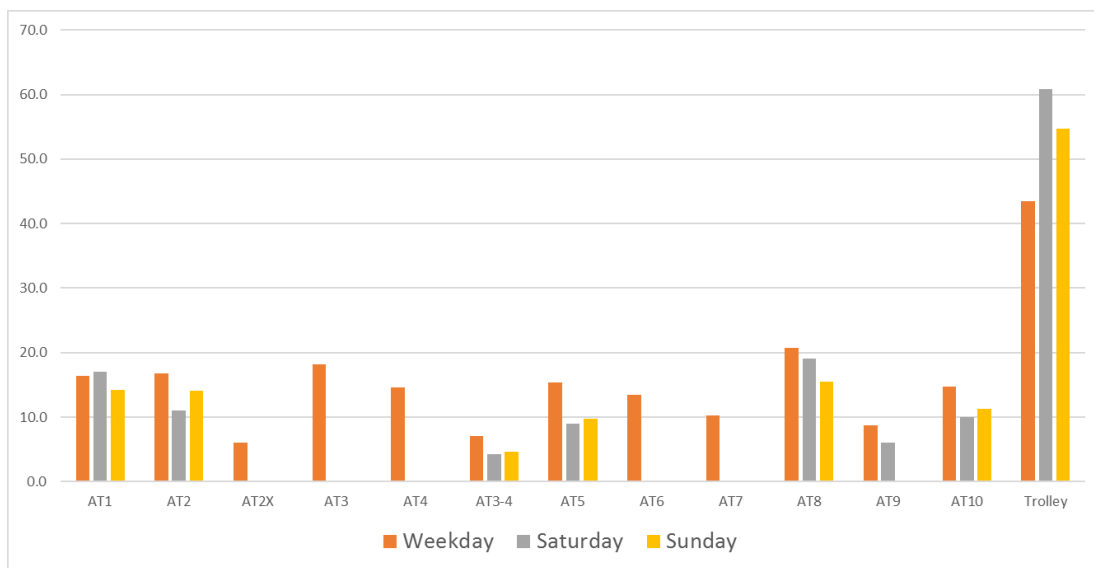
4.5 / Operating Ratio

One other common measure of cost efficiency in transit planning is the Operating Ratio, which measures the percent of total operating costs that are covered by passenger fares. Presumably, an efficient, well-designed transit system will generate higher ridership and greater fare revenues per unit cost of operating expense than a less efficient system. Based on FY 2014 and FY 2016 NTD data, the normal range for operating ratios is 15 to 25 percent. For FY 2017, DASH recorded an operating ratio of 30 percent, which was down from three percent in FY 2016. The annual DASH operating ratios for the last five years are shown in Figure 4-8.

Figure 4-8 / Annual DASH Operating Ratio (FY14 - FY18)
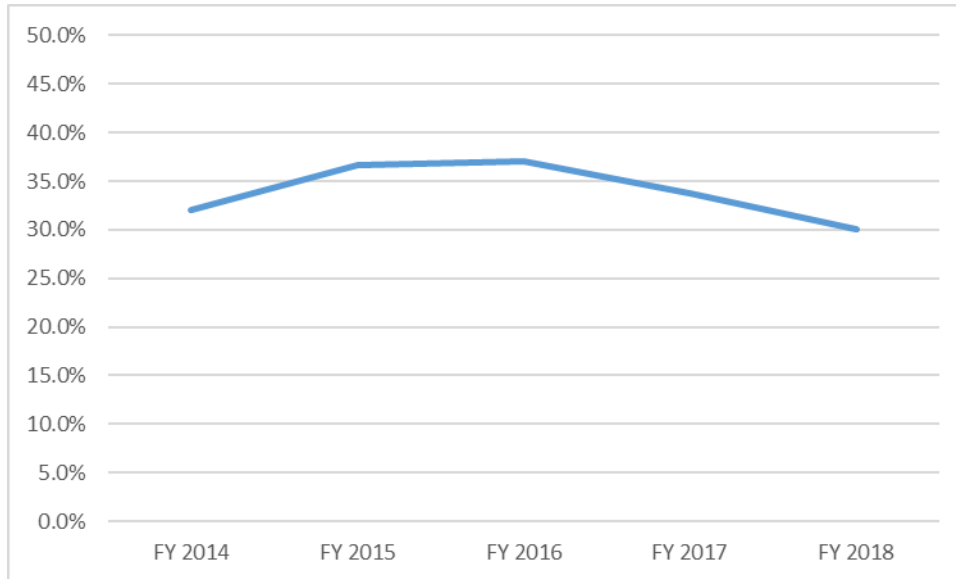
4.6 / Service Reliability

DASH is working to identify and address service reliability deficiencies that may have a negative impact on ridership and customer satisfaction. Service reliability can be measured by on-time performance, missed trip percentage, average miles per road call and customer feedback. It is important to note that service reliability is invariably tied to service frequency since the consequences of a missed trip are far less significant if the next bus is only 10 minutes away instead of 60 minutes away.

The most common indicator for service reliability is on-time performance. DASH recently implemented an Automated Vehicle Locator (AVL) system that tracks vehicle location and evaluates on-time performance with a much higher degree of accuracy than previous manual time checks. FY 2017 data collected using the manual process indicates that DASH was running "on-time" roughly 94 percent of the time, however, this data is typically collected by field supervisors during less busier periods and is likely skewed. For CY 2018, the new AVL data indicates that the actual on-time performance was roughly 82 percent, which is slightly lower than the industry standard of 85%. Planning staff are continuing to test the validity of this new method, which likely underestimates the on-time performance of buses to the final timepoint on each trip.

A chart showing weekday on-time performance by route is also included as Figure 4-9. The AT-1 is the most reliable route, likely due to the fact that its one of the few DASH routes that stays in western Alexandria and doesn't venture in Old Town. Most of the other routes average just over 80 percent on-time performance on weekdays.

The most challenging time of day for on-time performance is the weekday afternoon peak period. Overall on-time performance during the PM peak is roughly 76 percent, compared to 85 percent for the rest of the day. Although all routes are less reliable during the afternoon peak hour, the decrease for the AT-1, AT-7 and AT-8 are particularly noticeable.

Service reliability is also often impacted by the performance of the DASH maintenance department, which is responsible for ensuring that buses are maintained in good operating shape to minimize the chances for breakdowns and missed trips.   In FY 2017, DASH averaged over 14,700 miles per road call, which was a marked improvement from 12,800 miles per road call in FY 2017 and well above the industry average (11,500 miles per road call).   The FY 2018 total missed trip percentage was 0.028 percent, which was approximately 33 percent higher than the 0.021 percent of trips that were missed in FY 2017.

Figure 4-9 / Weekday On-Time Performance by Route and Time Period (CY 2018)
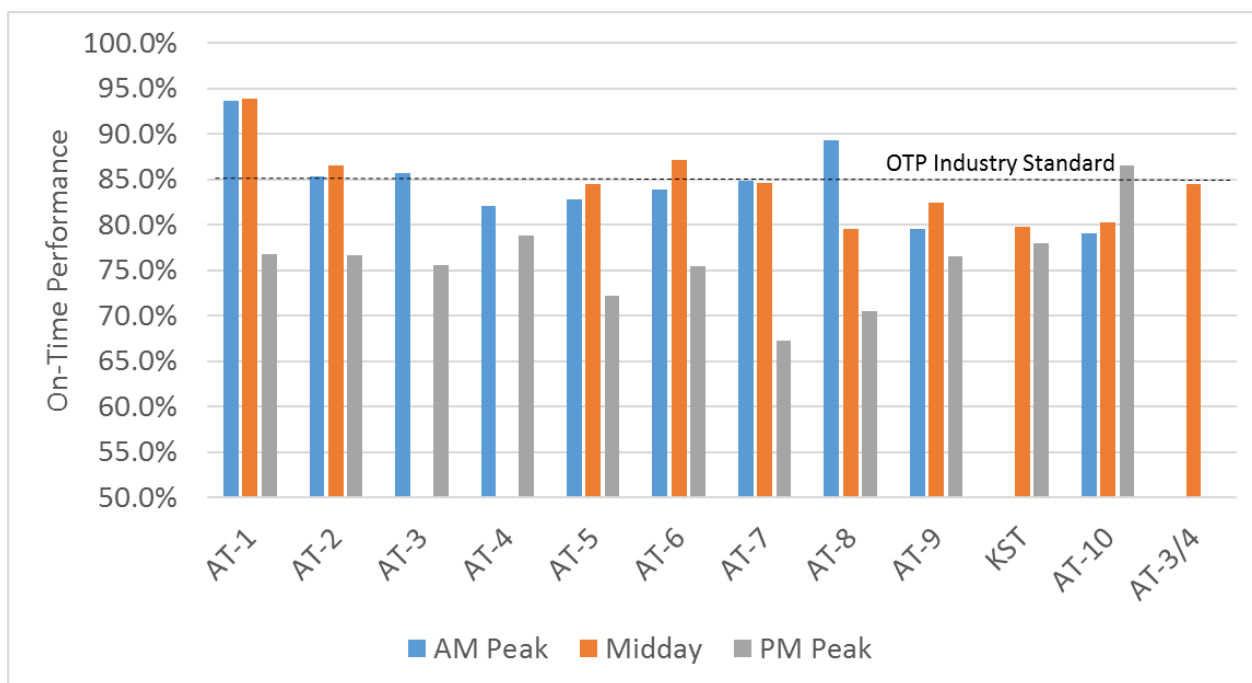
Another, more indirect measure of service reliability is customer feedback. The DASH Customer Service Department is responsible for documenting and categorizing all calls and e-mails that are received from passengers. In FY 2017, DASH received 39 valid complaints relating to schedule adherence. This was up dramatically from the 19 similar complaints that were registered in FY 2017, but is consistent with the 40 complaints that were registered in FY 2016.

4.7 / Access & Mobility

Two last performance measures depicts the degree to which transit directly improves local access and mobility. The fundamental purpose of public transit is to provide access to opportunities (e.g. jobs, housing, schools, shopping centers, day cares, civic centers, etc); therefore, the true measurement of access and mobility would be access to transit and the number of these "opportunities" that are easily accessible via transit.

Figure 4-10 provides a summary of access to the current DASH bus network for all residents, non-white residents, residents in poverty, and jobs in Alexandria. Access is measured by the percentage of each

group that are within a quarter-mile walking distance of transit service at 12pm on a weekday, or the baseline off-peak service. As shown below, the current DASH bus network does an exceptional job of providing access to basic transit for each of the groups identified below, however, the access to frequent all-day transit among these groups is virtually non-existent. This is a common theme that will be discussed through the Alexandria Transit Vision Plan process.

Figure 4-10 – Access to Transit & High-Frequent Transit
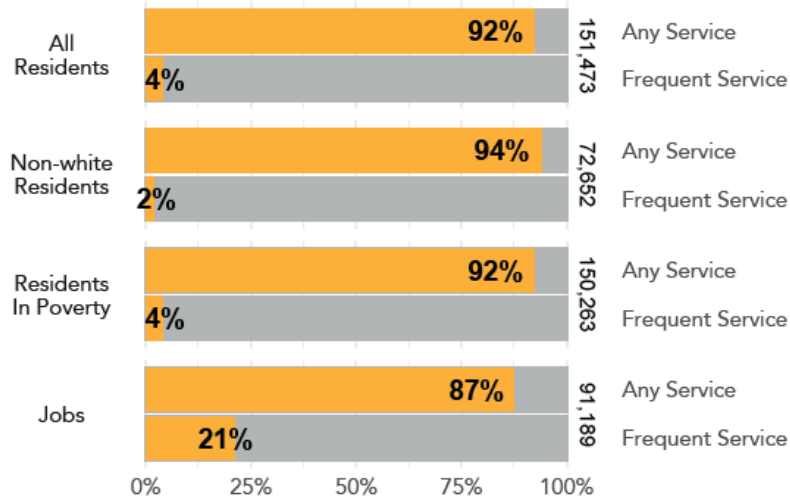
The second metric, mobility, can be derived from the isochrone maps that are included as Figures 4-11 and 4-12. Each map assumes that a fictitious transit user – represented as a stick figure – is at a selected location at a certain day and time. The colored isochrone shapes represent the area that can be reached from that specified location on the specified day and time using DASH or walking based on an average trip times of 15 minutes (white), 30 minutes (blue), 45 minutes (teal), and one hour (red). The trip time calculation accounts for both travel time, and waiting time based on route frequencies. The larger the isochrone shape, the more access to locations with different types of "opportunities" described above.

As an example, Figure 4-11 compares the mobility of a transit user at the King Street Metro during a weekday peak and a Saturday. Since the service levels are higher during the weekday peak, the size of the isochrone shapes on the left side are larger, particularly the blue area that shows how far the user can travel within 30 minutes. On weekdays, that person could travel from the King Street Metro to Foxchase Shopping Center within 30 minutes, but on a Saturday afternoon, it would take 40 minutes or longer on average. Therefore the larger colored areas equate to greater access to more opportunities via transit within a short period of time.

With the introduction of frequency and span improvements from the Alexandria Transit Vision Plan, these mobility metrics are expected to improve dramatically.

Figure 4-10 / Mobility Comparison to/from King Street Metro

Weekday – 5 PM

Saturday – 5 PM
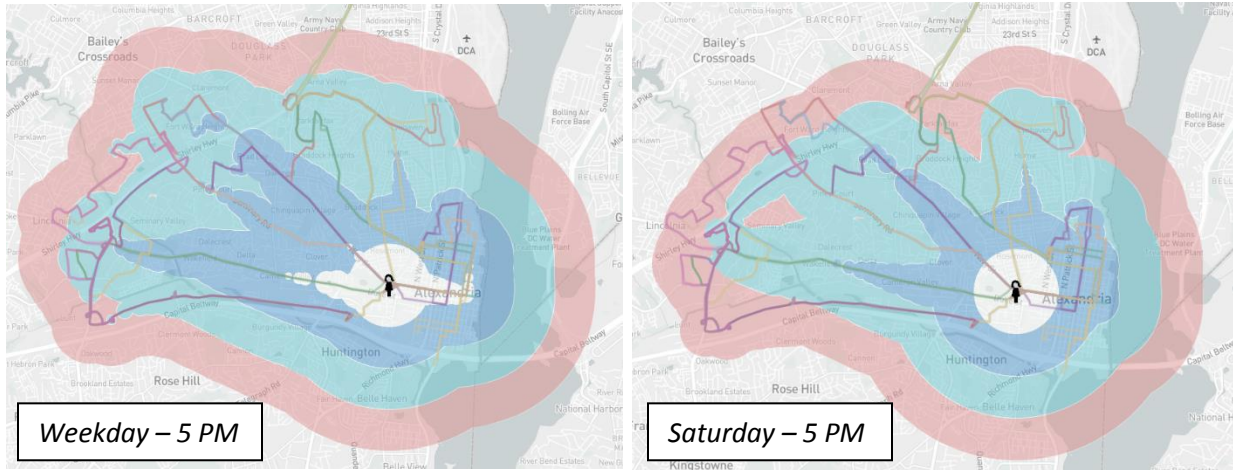
Figure 4-11 / Mobility Comparison to/from Stoneridge Apartments

Weekday – 8 AM

Sunday – 4 PM
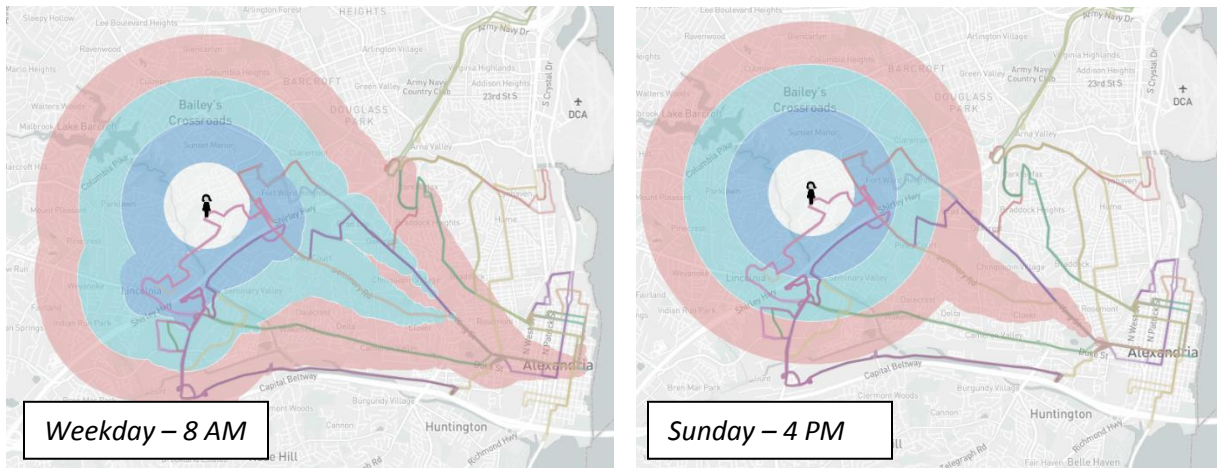
4.9 / System Performance Summary

Despite slight increases in total annual revenue hours, DASH has experienced an overall decrease in ridership on most routes over the last two year, and consequently a decrease in key measures of cost efficiency; the operating ratio has dropped from 33 percent in FY 2017 to 30 percent in FY 2018, and the boardings per revenue hour are down by 2-3 percent over the same period. Although these ridership declines are part of a larger national trend, local factors such as WMATA's Safetrack program, increased telecommuting, the proliferation of ridesharing and recent DASH service changes likely also have played a role.

In terms of another key metric, service reliability, DASH performs well but tends to experience significantly reduced on-time performance during the weekday afternoon commute period, particularly on routes such as the AT-5 and AT-8 that must navigate through the heavy traffic in Old Town Alexandria.

5.0 / Service & Fare Recommendations

The following section provides a series of recommendations for future service improvements and fare adjustments. These recommendations are based on staff analyses and guidance from the General Manager and ATC Board of Directors. The recommendations are organized chronologically, beginning with the service and fare assumptions from the FY 2020 ATC budget request. General service and fare recommendations for the rest of the six-year plan cycle (FY 2021 – FY 2025) are also included, but more detailed route-level recommendations are omitted since they will be largely determined over the next 6-12 months by the Alexandria Transit Vision Plan.

5.1 / Service Recommendations (FY 2020)

As part of the FY 2020 budget development process, DASH is planning the following fiscally-constrained service level assumptions:

- **No major service changes are proposed to regular DASH routes for FY2020.** Due to uncertainty surrounding the Alexandria Transit Vision Plan, no major service improvements are planned in FY 2020, other than those which are tied to I-395 Commute Choice Program funding or the Summer 2019 Metrorail Shutdown.

- **Platform miles and hours are projected to remain flat in FY 2020 compared to the adopted FY 2019 DASH budget assumptions.** Excluding the I-395 Commuter Choice program improvements and additional service provided in response to WMATA's Summer 2019 Platform Improvement Project, DASH projects that FY 2020 service levels for regular DASH routes and the King Street Trolley will remain flat as compared to FY 2019 (237,000 annual platform hours).

- **Projected Operating Ratio of 31.7% represents a slight decrease from 33.7% in FY 2019 adopted budget.** This decrease is attributed to declining ridership, the federal government shutdown in January, the King Street Metro Access Improvement Project, and expected effects of the Summer 2019 Metro Platform Improvement Project.

- **DASH to play key role in mitigating impact of Summer 2019 Metrorail Shutdown.** DASH has agreed to operate shuttle service during the first phase of WMATA's Platform Improvement Project, which is a shutdown of all Metrorail stations south of National Airport from Memorial Day to Labor Day 2019. DASH will be operating the Blue Line Shuttle seven days per week during this shutdown period, and will provide enhanced service on the AT3, AT4 and King Street Trolley on weekdays to help mitigate the impact of the closure. The vast majority of operating costs for these services will be reimbursed by WMATA and DRPT.

- **DASH to seek operating funding from I-395 toll funding program for service improvements.** As part of the inaugural I-395 Commuter Choice program for disbursement of toll revenues from the new I-395 Express Lanes, DASH will be submitting applications to enhance service on several DASH routes that provide local and express bus service along the I-395 corridor. These improvements will be compatible with the pending final recommendations of the Alexandria Transit Vision Plan, and would be implemented starting in October 2019.

- **Ridership decline of the last three years is expected to subside.** Based on early FY 2018 ridership trends, planning staff correctly projected that ridership would only decrease by two percent in FY 2018. Early trends for FY 2019 suggest that ridership may stabilize in FY 2020 with overall increases in ridership on regular DASH routes and a moderate decrease on the King Street Trolley.

- **King Street Metro Access Improvements.** The planned renovation and expansion of the existing King Street Metro transit center began in November 2018 and is expected to last until early 2020. During the initial 18-month project phase, the transit center is closed for construction and all bus stops have been temporarily relocated to the surrounding street network. At the end of Phase I, the new King Street Metro transit center will open with three additional bus bays and a more efficient bus circulation pattern. Additional changes to the route alignments, timetables, and layover locations will be implemented at that time.

- **Other Metrorail Station Improvements.** Additional projects at the Eisenhower Avenue, Van Dorn and Braddock Road Metro Stations are planned during the Summer 2019 Metrorail Shutdown to increase bus capacity and improve circulation. DASH plans to coordinate with WMATA and the City of Alexandria on these projects and will adjust bus service at these locations as needed.

5.2 / Fare Recommendations (FY 2020)

As part of the FY 2020 budget development process, DASH is planning to implement the following fare changes to increase passenger revenues and improve the organization's long-term financial stability:

- **Increase base fare from $1.75 to $2.00.** This represents a 12.5 fare increase, that will put DASH at the same level as the $2.00 base fares that are currently charged by neighboring transit providers (Metrobus, ART, Fairfax Connector, RideOn and PRTC). This change is proposed to be implemented at the completion of the Summer 2019 Metrorail Shutdown on September 1, 2019.

- **Increase monthly DASH Pass cost from $45 to $50.** This fare increase in DASH Pass cost will increase the average monthly DASH Pass savings from 10 cents to 16 cents per trip as compared to paying the new $2.00 base fare throughout the month. This change is proposed to be implemented at the completion of the Summer 2019 Metrorail Shutdown on September 1, 2019.

- **DASH will implement a Mobile Ticketing Pilot program.** In May 2019, DASH plans to launch a one-year mobile ticketing pilot program, which will allow customers to purchase their DASH fare products on smartphones using debit cards, credit cards and selected e-wallet platforms. During the pilot period, passengers will be required to show the validation screen on their phone to the operator, but if the pilot is successful, DASH would implement electronic fare validation, which uses a small reader attached to the farebox to validate mobile fare payments. DASH will be the first bus agency in Northern Virginia to pilot a mobile ticketing application and is working closely with NVTC and other agencies so that the tool could expanded to other agencies throughout the region in the future.

- **Convert DOT Paratransit Cards to SmarTrip Cards.** DASH is working with the City of Alexandria to transition DOT cards from the current paper version to a SmarTrip-enabled chip card. DOT cardholders will be able to tap their cards on the farebox of DASH buses which will increase operational efficiency, customer convenience, and data collection, while reducing the occurrence of fraud.

- **"Free Student Rides" Program will continue for the 2019-2020 school year.** DASH is planning to continue the "Free Student Rides" program for its third year with T.C. Williams, and its second year with Bishop Ireton, Episcopal and St. Stephen's & St. Agnes. DASH has identified several smaller private high schools within the City of Alexandria that have expressed interest in the program and will be considered for inclusion.

Staff analyses of the above fare adjustments project a resulting net ridership loss of 3.3 percent, but indicate that $262,000 in additional passenger revenues will be generated to help ensure the long-term financial stability of the DASH organization.

5.3 / Service & Fare Recommendations (FY 2020 – FY 2024)

The following service and fare recommendations have been developed by DASH Staff in consultation with city staff:

- **Alexandria Transit Vision Plan**. Based on the recommendations of the Alexandria Transit Vision (ATV) Plan, DASH will implement a set of comprehensive service adjustments beginning in FY 2021. As discussed in Chapter 2, the ATV kicked off in early 2018 and the specific short- and long-term service improvements will be determined in Summer 2019. The first short-term implementations will likely begin in July 2020.

- **Potomac Yard Metro Station**. WMATA is planning to construct a new in-fill Metrorail Station at Potomac Yard, between the existing Braddock Road and National Airport Metro Stations. The station will be constructed just west of the intersection of Potomac Avenue and East Glebe Road, with an adjacent bus transit center for DASH, WMATA and Metroway buses. Based on the expected opening date of early 2022, DASH plans to identify any corresponding service changes in this area during the Alexandria Transit Vision Plan process.

- **West End Transitway.** The City of Alexandria is planning to build the West End Transitway, a high-capacity BRT service that would operate along the I-395 corridor between Alexandria and the Pentagon. The original route began at the Van Dorn Metro with stops at Landmark, Mark Center, Southern Towers and Shirlington Transit Center before reaching the Pentagon. The project's first phase will provide service between Landmark and the Pentagon, with service beginning by FY 2023. Although a specific transit provider has not been identified for this service, DASH is expected to be considered due to its other nearby services and cost efficiency. Operating funds for this service are expected to be provided through I-395 Commuter Choice funding or the City of Alexandria's Transportation Improvement Program (TIP).

- **Key Development Areas.** Several key development areas are likely to see continued growth in over the next 5-6 years, and will warrant consideration for additional transit service. Although the specific corridors and proposed service levels will be identified in the Alexandria Transit Vision Plan, the areas of primary focus will include Carlyle, Eisenhower Avenue, Landmark Mall, and Potomac Yard.

- **Future Fare Changes.** Aside from the FY 2020 fare adjustments outlined in the previous section, no future changes to fare levels are currently planned.

6.0 / DASH Capital Budget Program

This section outlines the capital improvements that are planned to support the long-term viability and growth of the DASH bus system. The primary source of capital funding for DASH is the City of Alexandria's Capital Improvement Program (CIP), however, ATC capital improvements are also funded by other state and regional sources, such as the Virginia Department of Rail and Public Transit (VDRPT) and the Northern Virginia Transportation Authority (NVTA).

6.1 / FY 2020 – FY 2029 Capital Improvement Plan (CIP)

DASH relies upon capital funding from the City of Alexandria and regional funds from NVTA to pay for replacement buses, facility improvements, technology systems and a wide range of other capital projects. The City of Alexandria's Capital Improvement Program covers a ten-year period and operates on a two-year cycle. Based on the adopted FY 2019 – FY 2028 CIP, the city has allocated a total of $51 million for five different ATC capital projects. These projects include bus replacements, battery pack replacements, facility expansions, and investments in new technology.

Based on recent guidance from DASH management and City staff, DASH made several modifications to its capital funding requests for FY 2020. Table 6-1 depicts a summary of the approved FY 2019 CIP project funding requests and the major changes. These changes include the addition of funds from a related NVTA grant to the existing "DASH Fleet & Facility Expansion" Project and the rescoping of the existing "DASH Hybrid/Electric Battery Pack Replacement" project to include mid-life engine rebuilds.

6.2 / Fleet Replacement Plan

As shown in Table 6-2, DASH has purchased 27 replacement buses in the last 12 months. With the potential purchase of six additional replacement buses in FY 2020 through the VW Mitigation Trust program described below, DASH will be able to retire the last of its old diesel buses, which are now operating beyond their useful 12-year life cycle.

A detailed summary of the current Fleet Replacement Plan is included in Table 6-2. This table shows the proposed replacement schedule for each of the nine active sub-fleets of buses, based on a useful life cycle of 12 years. In order to maintain a State of Good Repair and ensure that service is provided in a safe and reliable manner, DASH must replace all buses that are more than 12 years old. Any buses that are replaced within the yellow portion of the table are buses that are being kept in service beyond their useful life, which represents a failure to maintain State of Good Repair.

As part of the recent switch from hybrid to clean diesel vehicles, the ATC Board of Directors and DASH leadership have expressed a strong desire to transition the fleet towards electric or zero-emission buses over the next 5-10 years. To this end, DASH has applied for state funding to purchase six electric buses, which will replace the last six of the old diesel buses. The funding for this purchase comes through the state's VW Mitigation Trust program, and would cover the cost differential between clean diesel and electric buses as well as charging equipment. A gradual transition to electric buses is outlined in the fleet replacement plan shown in Table 6-2, but is not included in the city's final adopted FY 2020 – FY 2029 Capital Improvement Program. Additional information on zero-emission fleet plans is in included in Section 6.5.

Table 6-1 / FY 2018 – FY 2027 Capital Improvement Plan (CIP) Summary

FY20 ATC Capital Improvement Plan (CIP) Final Submittal

Item	Project Description	FY 2020 Requests			FY 2020-2029 Request Totals		
		Previous	Updated	Net Change	Previous	Updated	Net Change
1	**Bus Fleet Replacement.** The Alexandria Transit Company (ATC) bus replacement schedule is based on the 12-year life cycle of a heavy-duty transit bus. Due to recent budgetary constraints and uncertainty surrounding the future of the hybrid bus program, ATC has delayed its purchase of replacement buses, and continued to operate older diesel buses well beyond their useful life and scheduled replacement date. Based on the recent recommendation of the ATC Board of Directors, ATC will be switching to clean diesel buses to meet its near-term fleet replacement needs and achieve SOGR standards in a reliable, cost effective manner. This funding will cover the cost of new clean diesel replacement buses and includes the eventual transition to electric buses for fulfillment of the DASH fleet replacement schedule.	$3,529,000	$3,529,000	$0	$23,458,000	$20,904,000	-$2,554,000
2	**DASH Hybrid Battery & Powertrain Replacement.** The hybrid/electric battery pack replacement at the bus's mid-life ensures reliable operation of DASH's current hybrid fleet, and the future electric bus fleet. **UPDATE: In response to an emerging problem with hybrid engine transmissions, DASH and the City have modified the scope of this project to include mid-life engine rebuilds. Note that the funding amount for FY20 has not been changed.**	$900,000	$900,000	$0	$4,800,000	$4,950,000	$150,000
3	**DASH Fleet & Facility Expansion.** The current DASH Facility has reached its maximum bus capacity and cannot accomodate future fleet expansion. DASH has secured funding from multiple state and regional sources for a staged implementation of expanded bus storage capacity, which will be integrated with facility and utility upgrades to support a zero-emission subfleet. The City's temporary parking arrangement for its overflow impound lot, currently housed on the adjacent DASH bus expansion land, will ultimately need to be relocated. This project also includes six (6) new buses, which are intended to be used to enhance service in high development areas such as Potomac Yard and the Van Dorn Corridor. **UPDATE: This CIP project now includes funding from the "DASH Transit Service Enhancements & Expansion" project, which includes $11.9 million in NVTA funding for facility and utility upgrades in support of a zero-emission bus fleet. The NVTA project also includes funding to pruchase eight zero-emission expansion buses.**	$0	$15,639,161	$15,639,161	$11,134,000	$23,067,161	$11,933,161
4	**DASH Electronic Fare Payment.** The current regional SmarTrip program is nearing its useful life. Alexandria Transit Company, along with the rest of the regional transit partners, will be working towards the development of a new fare payment system. This will take a number of years. In the meantime, the region will be procuring hardware and software to upgrade the current SmarTrip system to extend its useful life.	$450,000	$450,000	$0	$1,200,000	$1,200,000	$0
5	**DASH Technology.** This project will fund transportation scheduling software which allows a transit agency to design bus routes, create bus stops, schedule bus routes, combine individual bus trips into blocks, cut blocks into pieces that individual drivers will operate on a daily basis, assign individual drivers into runs, and provide customer information about the network. The automation allows for schedulers and transit planners to quickly develop many different scheduling scenarios which can significantly increase the operational efficiency of today's transit systems. **UPDATE: The city has helped DASH secure $200,000 in additional FY 2019 CIP funding to expand its Automated Passenger Counting (APC) system so that the entire fleet is equipped with APC devices by mid-2019.**	$0	$0	$0	$600,000	$855,745	$255,745
	TOTALS	$4,879,000	$20,518,161	$15,639,161	$41,192,000	$50,976,906	$9,784,906

6.3 / Fleet Expansion

In order to maintain appropriate urban service levels for the City of Alexandria, increase service frequency on productive existing routes, add new service in developing areas, and achieve an industry-standard spare ratio, DASH must periodically increase its active bus fleet size. The current fleet size is 85 vehicles. With an afternoon pull-out requirement of 75 buses, DASH is currently well below the industry standard 20 percent spare ratio.

To address the current fleet spare ratio deficiency, DASH is planning the following fleet expansions:

- **FY 2019 & FY 2020 DRPT Capital Assistance Grants.** DASH has worked closely with City of Alexandria and DRPT staff to rescope several of its outstanding bus procurement grants in order to secure funding for eight expansion buses over the next two years. By purchasing these buses, DASH will be able to achieve an industry-standard 20 percent spare ratio for its permanent active fleet.

- **FY 2018-2023 NVTA Six Year Plan Funding.** In 2018, DASH was awarded $11.9 million to be used for facility upgrades and for the purchase of eight zero-emission buses. These eight expansion buses are expected to be delivered in FY 2021.

- **FY 2021 SmartScale Funding.** DASH has secured roughly $11 million in state DRPT funding through the Smartscale program. Most of the funding for this project will be used towards the facility expansion project described in Section 6.6, but the funds will also cover the purchase of six expansion buses to be used towards improved DASH bus service in major development corridors throughout the city.

- **Contingency Fleet**. In preparation for the Summer 2019 Metrorail Shutdown, DASH purchased 13 used buses to help support shuttle operations. These buses included 11 articulated buses, and 2 40-foot suburban-style transit buses. At the end of the summer closure, DASH will evaluate the condition of these buses to determine if they are still in good working condition. If maintenance staff determines that they may be used going forward, DASH may use some of these vehicles to temporarily boost their spare ratio and to implement any service enhancements from the I-395 Commuter Choice program, beginning in October 2019.

Based on these planned expansions, DASH could increase its active fleet size from 85 buses to 101 buses as early as FY 2021.

6.4 / Battery Pack Replacement

Nearly two-thirds of the DASH active bus fleet is comprised of hybrid-propulsion buses. Hybrid buses rely on battery packs, which must be replaced after six years. These mid-life battery placements allow the hybrids to continue operating for their full useful lifespan of 12 years. As shown in Tables 6-1 and 6-3, DASH is requesting over $4.9 million in CIP funds for these hybrid battery pack replacements, which are also subject to State of Good Repair requirements, and mid-life Powertrain rebuilds. For FY 2019, DASH is requesting $900,000 to complete necessary mid-life battery pack replacements and engine rebuilds.

Table 6-2 / Fleet Replacement Schedule.

Fiscal Year			2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Delivery Year	Type	Qty	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
2002 Orions	Diesel	8	6											
2005 Orions	Diesel	14	2	12										
2007 Orions	Diesel	9	2	1	0	6								
2007 Gilligs	Diesel	4	4											
2011 Gilligs	Hybrid	15					6	6	3					
2012 Gilligs	Hybrid	10							3	7				
2014 Gilligs	Hybrid	7										7		
2015 Gilligs	Hybrid	14										7	7	
2017 Gilligs	Hybrid	6												6
2018 Gilligs	Clean Diesel	14												
2019 New Flyers	Clean Diesel	13												
Replacement Buses	Clean Diesel		14	13	0	0	4	4	3	3	2	0	0	0
Replacement Buses	Electric		0	0	0	6	2	2	3	4	5	7	7	6
Total Replacement Buses			14	13	0	6	6	6	6	7	7	7	7	6
Expansion Buses	Clean Diesel		0	0	0	8	0	0	0	0	0	0	0	0
Expansion Buses	Electric		0	0	0	0	8	4	2	0	0	0	0	0
Total Expansion Buses			0	0	0	8	8	4	2	0	0	0	0	0

Table 6-3 / Battery Pack Replacement Schedule

Fiscal Year	Qty	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
2011 Gilligs	15	6										
2012 Gilligs	10		10									
2014 Gilligs	7		7									
2015 Gilligs	14		1	7	6							
2017 Gilligs	6				2	4						
2022 Electrics (VW - TBD)	6									6		
2023 Electrics (NVTA)	8										4	4
Total Battery Replacements		6	18	7	8	4	0	0	0	6	4	4

6.5 / Electric Bus Program

In the last 18 months, DASH has taken great strides towards transitioning to electric buses as a sustainable, long-term solution for its fleet replacement needs. DASH staff has taken the following steps:

- DASH management has held a continued dialogue with city staff, city advisory boards, local utility company officials, electric bus manufacturers, and partner transit agencies that have either already purchased electric buses or are considering doing so. DASH and key city representatives formed a Zero-Emission Fleet Working Group in 2018 to help guide the transition planning.

- Members of the DASH executive leadership team have toured the New Flyer electric bus manufacturing facility in Aniston, Alabama and attended the Zero Emission Bus Conference in September 2018 in Los Angeles, California to learn more about how the buses are built and how the technology works;

- DASH staff have arranged for multiple electric bus demonstrations with leading electric bus manufacturers, whereby DASH is loaned an electric bus for a limited period of time so that it can be tested in revenue service and displayed at public events for community feedback;

- Based on these demonstrations, DASH has been able to collect and analyze a wealth of telemetric bus performance data to help determine how effectively electric buses could be used to meet current operational needs;

- DASH has modified its two most recent Capital Improvement Program (CIP) funding requests to the City of Alexandria to include funding for electric replacement buses as early as FY 2020. The request assumes that the electric bus purchases would increase each year until FY 2026, at which point all DASH replacement buses would be electric buses;

- DASH has been awarded multiple regional and state grant funding opportunities through VDOT (SmartScale) and NVTA (70% Funds) that will help cover the cost of facility expansions, upgrades, infrastructure improvements, and additional electric buses, bus chargers, and maintenance equipment over the next 3-5 years; and

- DASH is currently in the process of completing a consultant-led Feasibility Review that will identify additional long-term considerations that will be addressed as part of an upcoming Electric Bus Implementation Plan.

- DASH has applied to receive funding for six electric buses through the state's Volkswagen Mitigation Trust program. If selected, DASH will receive funding in FY 2020 to cover the cost differential of purchasing six electric buses and charging equipment. In anticipation of this award, DASH has requested to move a portion of its NVTA funding up from FY 2021 to FY 2020 to cover the costs of facility and utility upgrades that will be necessary to support the six buses.

If DASH is selected to receive electric bus funding from the VW Mitigation Trust program, DASH will be able to purchase its first six electric buses in late-2019 with an expected delivery date of no later than

Spring 2021. These six buses will allow DASH to evaluate the performance of electric buses in daily revenue service to help inform a long-term decision on how quickly the fleet transition to zero-emission buses can be made. The Zero-Emission Fleet Feasibility Review and subsequent Zero-Emission Fleet Implementation Plan will also guide this decision and process.

6.6 / DASH Facility Expansion

As part of the $11 million DRPT SmartScale project mentioned above, DASH has secured funding to expand its existing garage facility to increase vehicle capacity from roughly 90 buses to over 130 buses to meet anticipated service demand in the coming decades. The existing William B. Hurd Transit Facility was opened in 2009, but has now reached its maximum bus capacity.

In preparation for future expansion, the City of Alexandria secured the rights to the parcel of land immediately west of the existing DASH facility. This parcel, which is currently occupied by a temporary impound lot, will be regraded and integrated into the existing facility. Construction is scheduled to begin in FY 2021, and the new expanded facility would open by FY 2023.

More recently, DASH has been awarded additional funding through the FY 2018 – 2023 NVTA Six-Year Plan to construct the necessary infrastructure improvement to prepare the garage for electric buses. This infrastructure will allow for depot charging, and will be required to maintain a sub-fleet of electric buses. Funding for this project has been moved up from FY 2021 to FY 2020 in anticipation of the six electric buses that DASH could be receiving through the VW Mitigation Trust program.

6.7 / Technology Improvements

In recent years, DASH has placed an emphasis on leveraging new technologies to improve passenger experience, facilitate intra-departmental coordination and improve standard business practices. The FY 2020 – FY 2029 CIP request includes funding for automated passenger counters (APC's), improved scheduling software and a next-generation fare technology.

DASH was awarded $200,000 in FY 2019 to retrofit its current fleet with APC equipment and is preparing to move forward with project implementation by mid-2019. With these installations, nearly 100% of the DASH fleet will be equipped with APC's and much more detailed ridership data will be available for service planning decision-making. The scheduling software that is allocated for FY 2023 will allow DASH to plan and manage its routes, schedules and driver assignments with greater efficiency. The next-generation fare technology (formerly NEPP) funding will be used to upgrade the fare payment system that has reached the end of its useful life. DASH is working with WMATA and other partner agencies on the development of this system.

DASH is also finalizing the implementation of several other new grant-funded intelligent transportation systems (ITS) technologies. These include Transit Signal Prioritization (TSP) along the Duke Street corridor, real-time bus arrival screens at selected high-ridership bus stops, real-time SMS texting, and several new operations management technologies (Smartyard, TMS Daily Ops, MobileCAD).

Lastly, in May 2019, DASH plans to launch a one-year mobile ticketing pilot program, which will allow customers to purchase their DASH fare products on smartphones using debit cards, credit cards and selected e-wallet platforms. During the pilot period, passengers will be required to show the validation

screen on their phone to the operator, but if the pilot is successful, DASH would implement electronic fare validation, which uses a small reader attached to the farebox to validate mobile fare payments. DASH will be the first bus agency in Northern Virginia to pilot a mobile ticketing application and is working closely with NVTC and other agencies so that the tool could expanded to other agencies throughout the region in the future.

6.8 / Other Capital Outlay Items

The FY 2020 ATC proposed operating budget also includes capital outlay funding for regular equipment replacement. This funding will be used for the replacement and repair of items such as computers, network equipment, building security and surveillance systems, garage doors, and vehicle lifts which have reached the end of their useful lives.