

# TRANSIT PERFORMANCE IN THE I-66 INSIDE THE BELTWAY CORRIDOR



June 2018

*This report summarizes the performance of public transportation systems serving the I-66 inside the Beltway corridor in Northern Virginia. In December 2017, the Commonwealth of Virginia instituted dynamic tolling during peak periods along I-66, from the Capital Beltway in Fairfax County to the Roosevelt Bridge leading to Washington, D.C. This stretch of roadway was previously a restricted facility, limited to high occupancy vehicles (HOV2) during commuting hours, inbound (east) in the morning and outboard (west) in the afternoon. Upon implementation of the dynamic tolling, the Northern Virginia Transportation Commission (NVTTC) initiated the I-66 Commuter Choice program, a multimodal grant program that funds transit and transportation demand management services to complement the tolling in order to move more people through the corridor during peak periods. As part of this effort, NVTTC began tracking the overall transit performance changes along this corridor.*

## OVERVIEW

Public transportation plays an important role along the I-66 inside the Beltway corridor, transporting approximately 40 percent of commuters during peak periods. That's a more than three times greater transit mode share than Northern Virginia as a whole. Public transit ridership along the corridor generally follows regional and national public transportation ridership trends, which have showed some decline. In contrast to this trend, express buses, some of which are funded by the I-66 Commuter Choice program, experienced strong and growing ridership, while demonstrating faster and more reliable running times due to I-66 tolling and resulting traffic condition improvements.

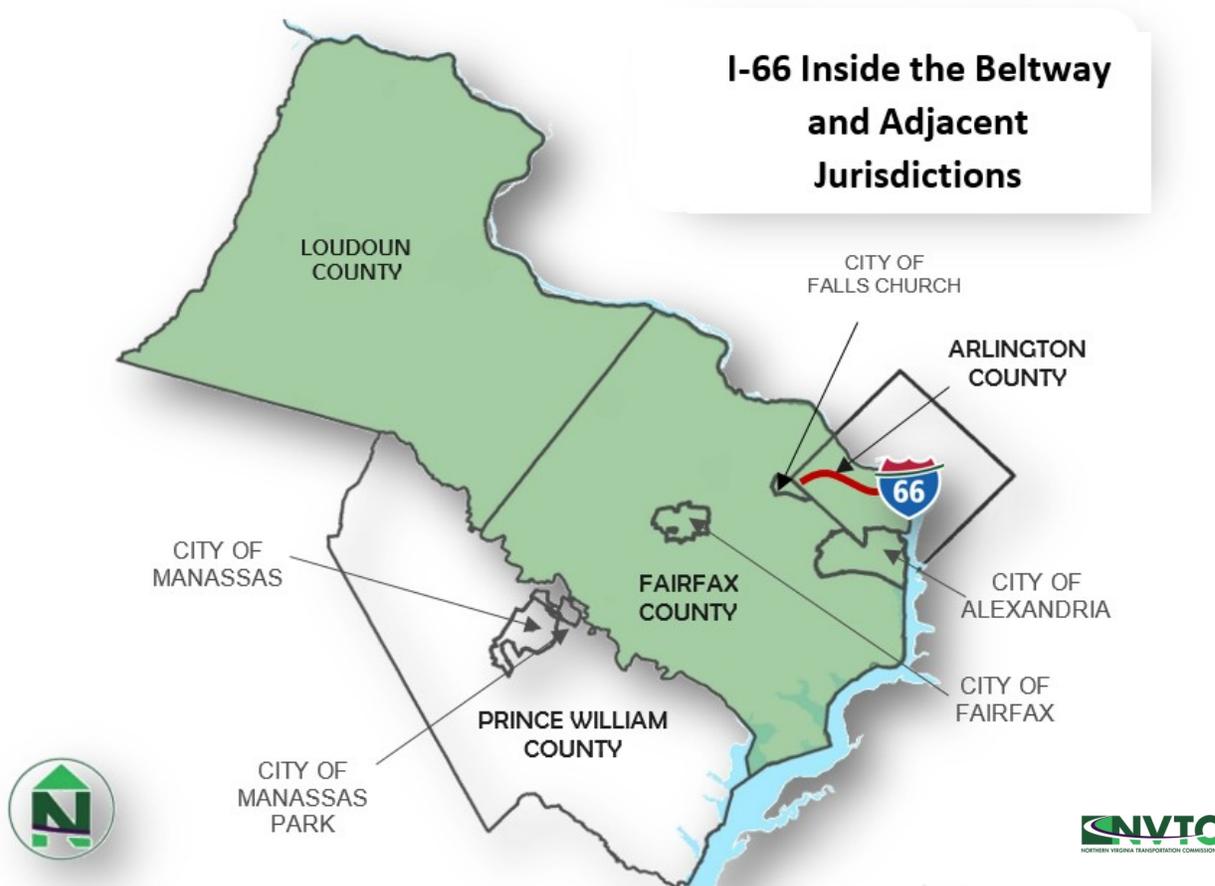
## KEY FINDINGS

- Public transportation plays a vital role along the I-66 corridor. According to a 2015 mode share survey, approximately 60 percent of person throughput was solo drivers and carpoolers, while 40 percent was commuters travelling via Metrorail, Virginia Railway Express (VRE), express bus, and local bus.
- Transit ridership in the I-66 inside the Beltway Corridor is largely dictated by regional transit ridership trends, which are influenced by employer transit benefits, transit service reliability, telework, and real estate development, among others.<sup>1</sup> There is insufficient data to disentangle the effect of tolling on transit ridership from these larger trends.
- Consistent with regional trends, local bus routes in the corridor showed ridership declines.
- Commuter and express bus routes in the corridor showed significant increases in ridership coinciding with the implementation of tolling and the introduction of new service related to the I-66 Commuter Choice program.
- Transit providers have reported that commuter bus running times have improved since I-66 tolling began due to improved traffic conditions. Transit providers are in various stages of data collection to assess travel time savings and will continue to monitor run times.
- NVTTC will continue to work with local and regional transit agencies to monitor corridor transportation performance.

<sup>1</sup>WMATA (2017). *Understanding Rail and Bus Ridership*, presentation at WMATA Board Finance Committee Meeting, October 12.

## BACKGROUND

At NVTC's January 2017 meeting, Deputy Secretary of Transportation Nick Donohue presented an update on the performance of I-66 inside the Beltway since the inception of tolling, noting that continued monitoring and evaluation would be necessary to determine the performance of the facility and corridor. At that meeting, the Commission requested that the Commonwealth return to brief the Commission on roadway performance and asked that transit be included in the performance evaluation. This memo supplements performance updates of the I-66 tolling program with performance statistics of public transportation services in the corridor. These public transportation services include all that service the corridor, whether or not they are funded through the I-66 Commuter Choice program.

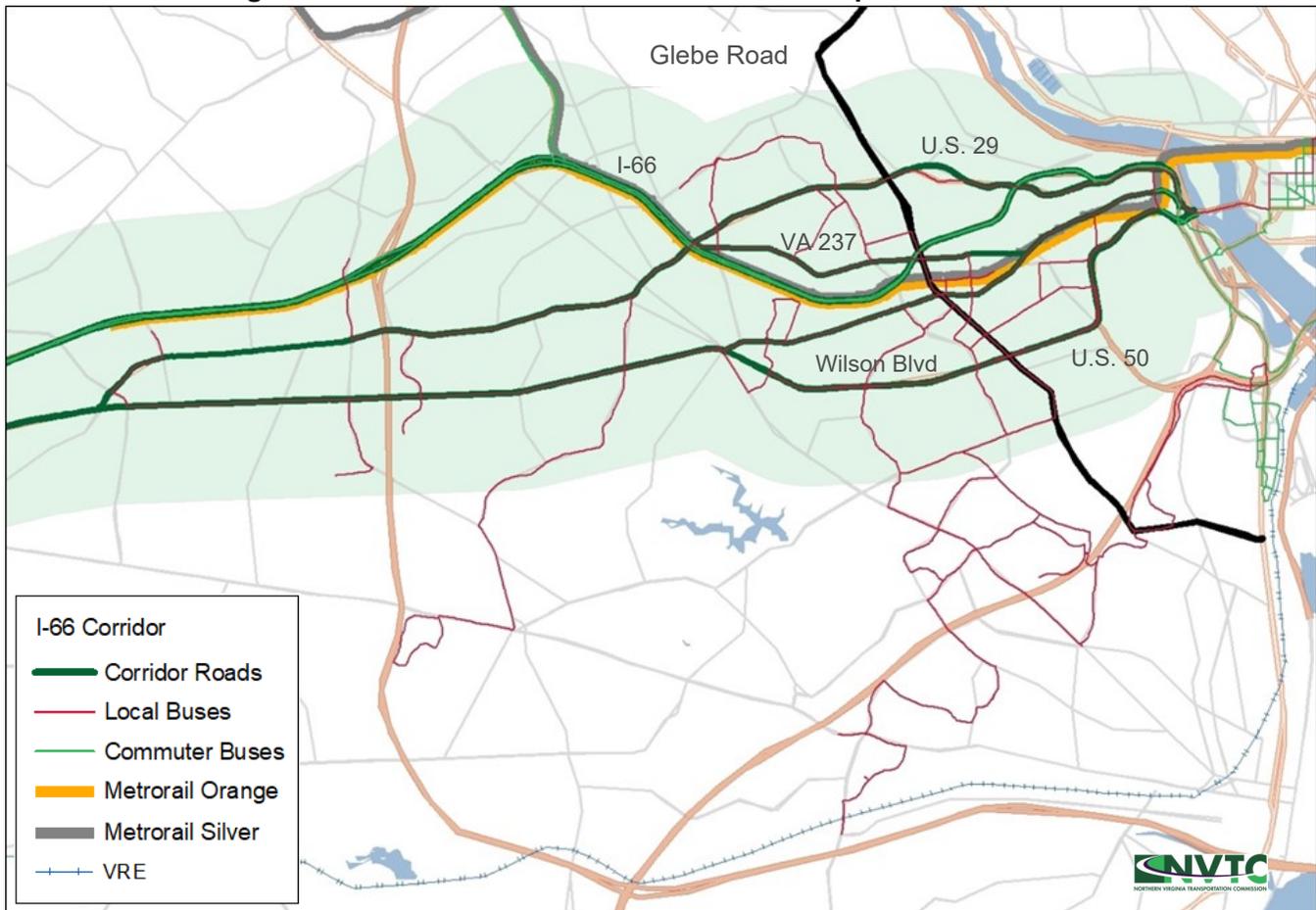


The I-66 corridor is a multimodal transportation network that moves commuters between Northern Virginia's outer and inner suburbs as well as Washington D.C. On a typical weekday AM peak period, approximately 60,000 commuters travel the corridor toward Washington D.C., over 40 percent of whom use public transportation (Metrorail, VRE, and commuter and local buses).<sup>2</sup>

The following sections present passenger throughput in the I-66 corridor and ridership statistics of public transportation systems along the corridor. The limited amount of data currently available highlights the need for continuous monitoring of both vehicular and public transportation traffic to evaluate the performance of transportation systems in the corridor.

<sup>2</sup>Transportation Planning Board (2016). 2015 Mode Share Study: I-66 Corridor Inside the Beltway Final Report, August.

Figure 1: I-66 Corridor Roads and Public Transportation Services



Source: Transportation Planning Board (2016)

### I-66 Inside the Beltway Corridor

The I-66 inside the Beltway corridor serves commuters from the suburbs along the interstate including Loudoun and Fairfax counties, the cities of Fairfax and Falls Church, and communities served by PRTC's OmniRide, running between Prince William County and job centers in Washington, D.C. and Arlington County (**Figure 1**). The corridor consists of highways and arterials including I-66, US 50, US 29, VA 237 (Washington Blvd.), and Wilson Blvd., as well as public transportation systems such as Metrorail, VRE, and express and local buses.

This report follows a study conducted by the Transportation Planning Board (TPB) in 2016 in defining the I-66 multimodal corridor as consisting of roads and public transportation services. The roads included:

- I-66 (east and west bound)
- U.S. 29 (Lee Highway, north and south bound)
- VA 237 (Washington Blvd., east and west bound)
- Wilson Blvd. (east and west bound)
- U.S. 50 (east and west bound)

The following railway lines serve the I-66 corridor:

- Metrorail's Orange and Silver lines
- VRE's Manassas Line, which runs parallel to I-66

The following local bus routes also serve the corridor:

- Metrobus: 1A, 1B, 1E, 1Z, 2A, 3Y, 4A, 5A, 22A, 22B, 22C and 25B<sup>3</sup>
- ART – Arlington Transit: 41, 51, 52, 55 and 75<sup>4</sup>

The following express bus services travel through the corridor:<sup>5</sup>

- Fairfax Connector 599 (Pentagon–Crystal City Express) and 699 (Government Center– Downtown D.C.)
- Loudoun County Transit commuter bus from Dulles North Transit Center, Dulles South, Brambleton, Telos, Stone Ridge, Ashburn North, and Christian Fellowship Church, to Rosslyn, Crystal City, the State Department, or Independence Avenue and 12th Street, SW in Washington, D.C.
- PRTC OmniRide Manassas Route (from the Manassas Mall or Portsmouth commuter lots to the Pentagon) and Gainesville Route (from the Cushing Road commuter lot to the State Department).

### MODAL SHARE OF I-66 COMMUTING TRIPS

The Transportation Planning Board’s “2015 Mode Share Study: I-66 Corridor Inside the Beltway,” provides a snapshot of how people move through the corridor. The study counted passengers in transit vehicles, carpools and automobiles, as well as those on bicycle or foot. This recurring mode share study provides the most complete understanding of movement through and mode shifts within the corridor. Future mode share studies are recommended to comprehensively evaluate the performance of tolling, transit, and transportation demand management programs in the corridor.

**Table 1** and **Figure 2** summarize the modal share of I-66 corridor passenger throughput, illustrating how vital public transportation is to this multimodal transportation system. On a weekday during the AM peak period (6:30-9:30 a.m., as defined in the TPB study), person throughput in the I-66 corridor as measured at Glebe Road was 59,300. Fifty-nine percent of these commuters drove or carpooled, while 41 percent took public transportation, namely Metrorail, VRE or commuter/local bus services. In contrast, the American Community Survey 5-Year estimates (2016) found that 12 percent of commuters residing in the NVTC region travel to work by public transportation (excluding taxi).

**Table 1: I-66 Corridor AM Peak Person Throughput by Route & Mode, 2015**

Facility or Service	Drive Solo	Carpool	Person Throughput	Share by Mode
I-66	33%	67%	14,600	
U.S. 29	82%	18%	3,500	
VA 237	82%	18%	3,200	
U.S. 50	83%	17%	10,600	
Wilson Blvd	80%	20%	3,000	
<b>Driving</b>				59%
Metrorail			17,800	
VRE			2,400	
Express buses			2,300	
Local Buses			2,000	
<b>Public Transportation</b>				41%
<b>Total</b>			<b>59,300</b>	

Note: Numbers may not add up due to rounding. Source: Transportation Planning Board (2016)



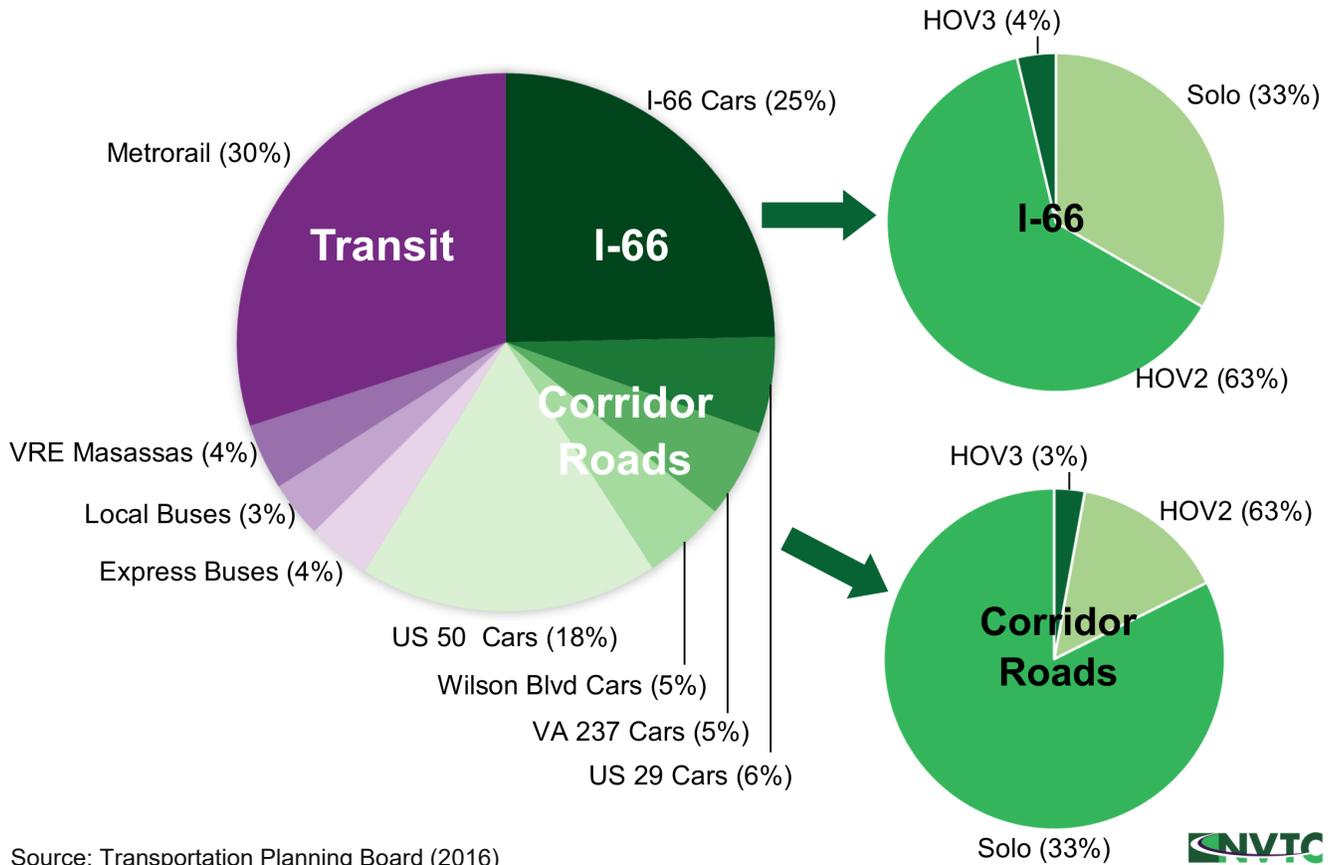
<sup>3</sup>Metrobus Route 3A was replaced by ART 55 on December 16, 2015.

<sup>4</sup>ART 55 replaced Metrobus Route 3A on December 16, 2015.

<sup>5</sup>The following services started with the support from I-66 Commuter Choice program in 2017: Fairfax Connector 699; Loudoun County Transit Stone Ridge service; and PRTC OmniRide Gainesville to Pentagon service.

Looking at Metrorail’s Orange and Silver lines, which run in the interstate’s median, and express buses, which transport 2,300 commuters each rush hour, public transportation’s person throughput is more than 30 percent larger than that of solo drivers and carpoolers combined. Relying on the Transportation Research Board’s Highway Capacity Manual, which shows that the capacity of an interstate class highway is approximately 1,600 vehicles per hour per managed lane, one can infer that express buses save more than one lane for one hour during the AM peak period. Similarly, Metrorail plays a vital role in transporting commuters along this corridor, saving capacity of over 11 managed lanes for one hour during the AM peak period.

**Figure 2: Corridor-wide Person Throughput by Mode, 2015**



Source: Transportation Planning Board (2016)



### IMPACT OF I-66 TOLLING ON PUBLIC TRANSPORTATION

Tolling on I-66 inside the Beltway began on December 4, 2017. Tolls influence operation of public transportation systems serving the I-66 corridor in various ways. This report focuses on two of them: ridership and running time.

Local and regional transit operators provided average weekday ridership from July 2016 through February or March 2018. As only four months’ data is available, the ability to analyze the impact of tolling on transit ridership is limited. It is expected that toward the end of 2018 more comprehensive data will become available. The following subsections report weekday average ridership of I-66 corridor transit services by railways (Metrorail and VRE), local buses (Metrobus and ART-Arlington Transit), and express buses (Loudoun County Transit, Fairfax Connector, and PRTC OmniRide).

In regard to running time, limited data is available to evaluate the impact of I-66 tolling. This report presents a collection of available quantitative and qualitative information provided by operators of express buses that use I-66.

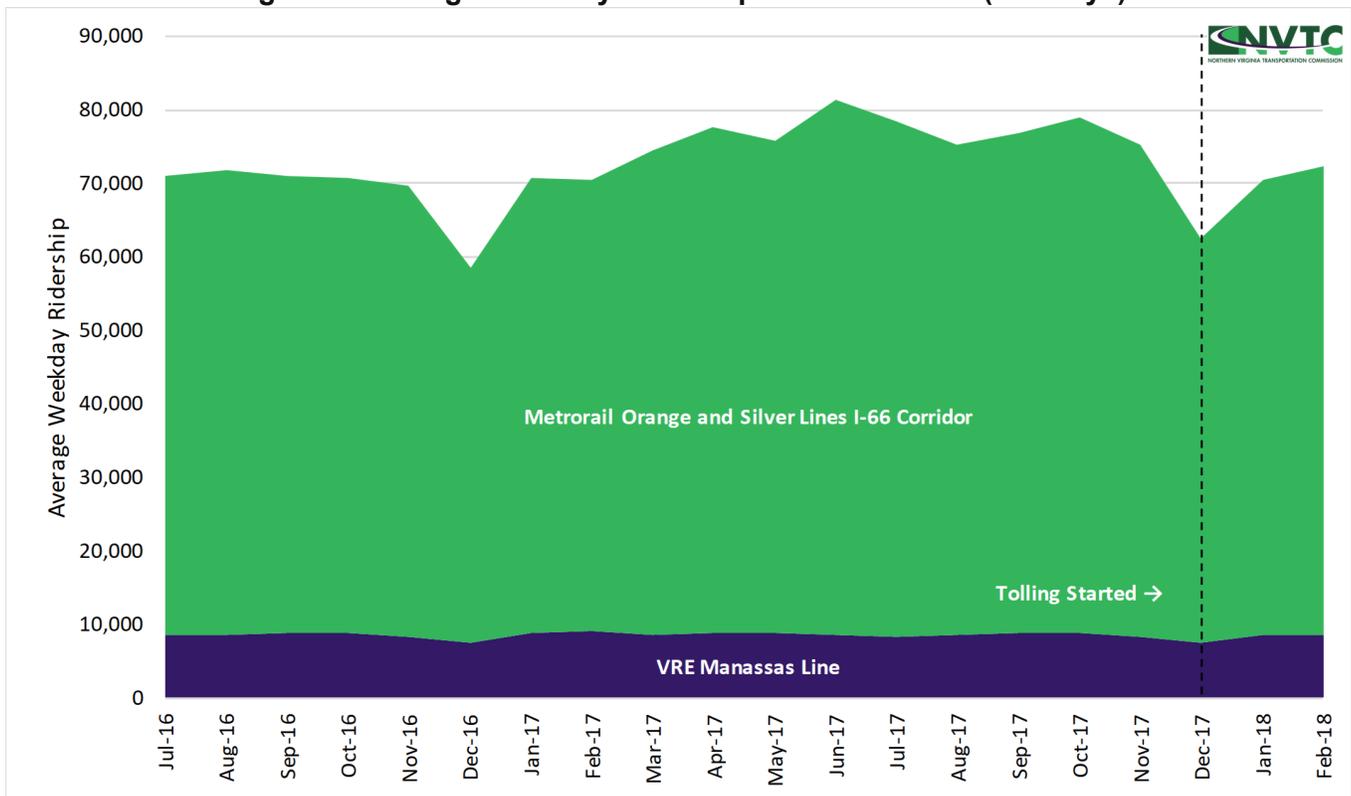
### Impact of I-66 Tolling on Public Transit Ridership

Ridership of public transportation systems serving the I-66 corridor is largely dictated by Metrorail, which constitutes over 60 percent of the corridor’s public transportation travel demand. Since July 2017, Metrorail’s ridership has shown increases compared to the same month in the previous year, due in part to SafeTrack,<sup>6</sup> an accelerated track work to improve safety and reliability of the Metrorail in the previous year, and associated service disruptions. Other public transit providers, however, generally experienced ridership decreases. While this was especially so with local buses (Metrobus and ART-Arlington Transit), express bus services experienced increases.

#### Railways: Metrorail and VRE

Figure 3 shows average weekday ridership on Metrorail’s Orange and Silver lines, between stations west of Ballston and Ballston and stations eastward, as well as VRE’s Manassas Line from July 2016 to February 2018. Metrorail ridership increased in FY2018 which started in July 2017, due in part to SafeTrack and associated service disruptions in the previous year. In February 2018, two months into I-66 tolling, average weekday ridership of Metrorail was 4 percent higher than February 2017, while the average weekday ridership of VRE decreased by 5 percent from February 2017 to February 2018. It is difficult to discern the influence of I-66 tolling from these statistics.

Figure 3: Average Weekday Ridership of I-66 Corridor (Railways)



Note: Metrorail average weekday ridership of trips between Wiehle-Reston East, Spring Hill, Greensboro, Tysons Corner, McLean, Vienna, Dunn Loring, West Falls Church, and East Falls Church and all other stations. Ridership includes peak and non-peak periods.

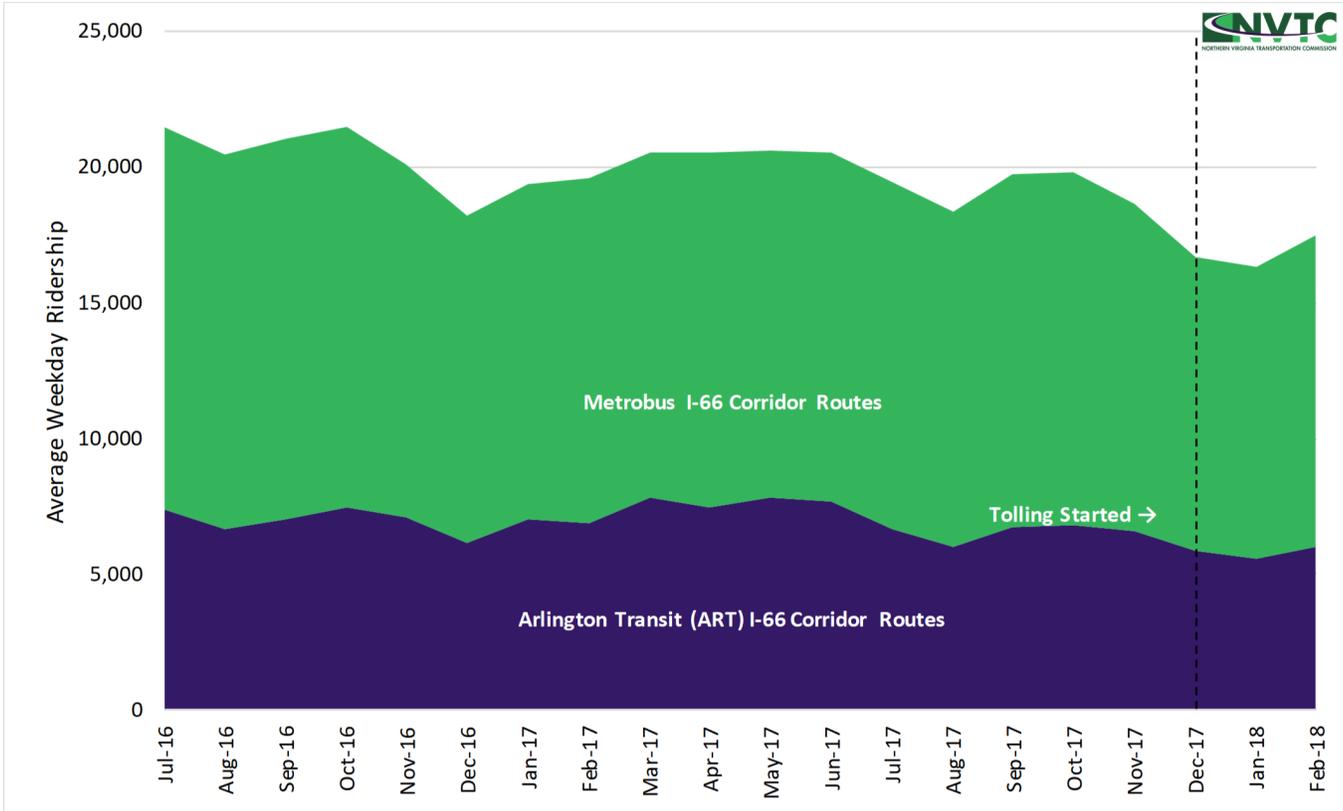
Source: WMATA and VRE

<sup>6</sup>WMATA SafeTrack ([www.wmata.com/service/SafeTrack.cfm](http://www.wmata.com/service/SafeTrack.cfm))

**Local Buses: Metrobus and ART-Arlington Transit**

Local buses serving the I-66 corridor generally experienced declining ridership trends between July 2016 and February 2018 (Figure 4). Average weekday ridership of Metrobus I-66 corridor routes decreased 10 percent from February 2017 to February 2018, following a trend that extends to July 2016, the beginning of the study period. Similarly, the average weekday ridership of ART-Arlington Transit I-66 corridor routes decreased by 12 percent from February 2017 to February 2018. These declines persist before and after the I-66 tolling, and the impact of tolling is unclear with available statistics.

**Figure 4: Average Weekday Ridership of I-66 Corridor (Local Buses)**



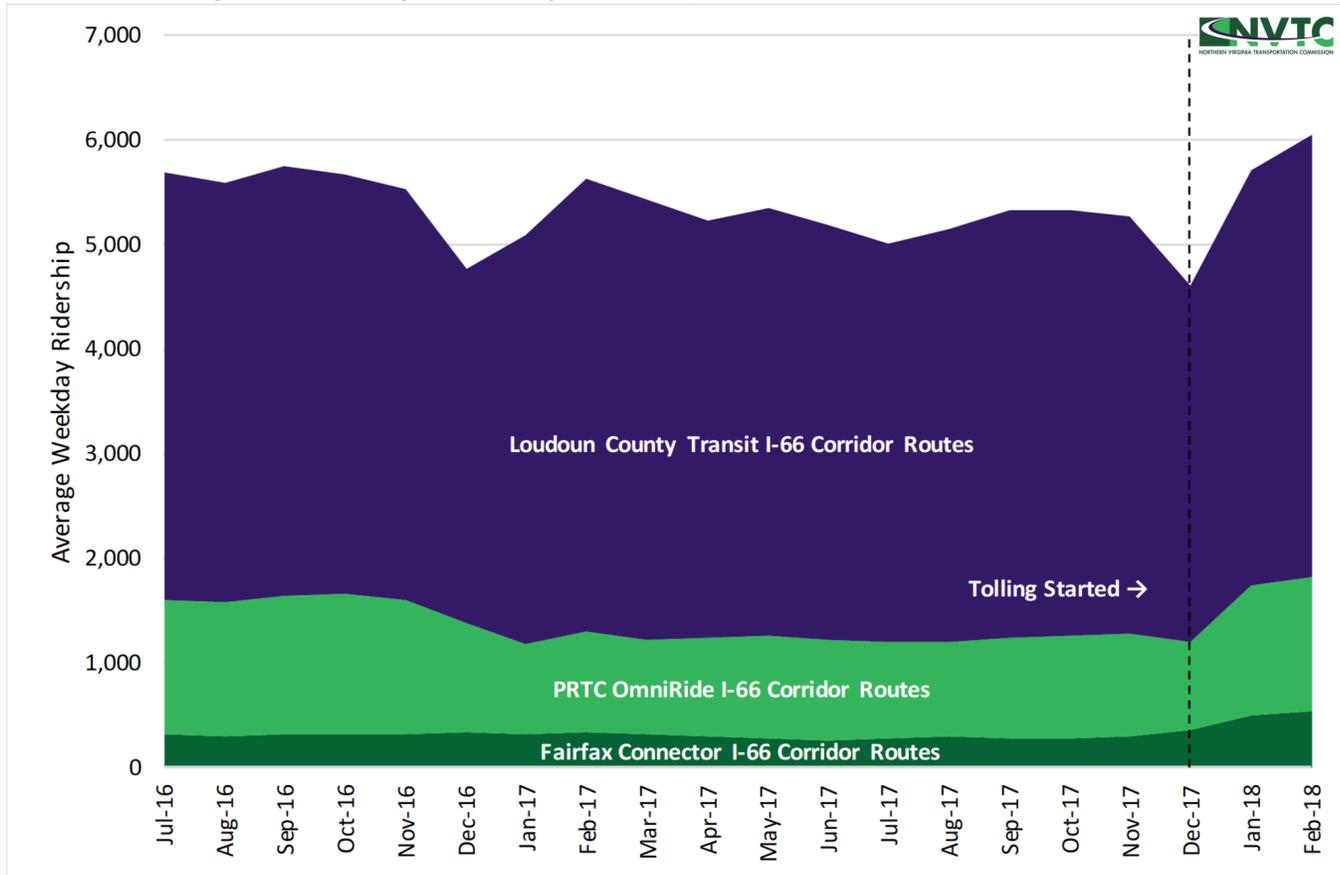
Note: Metrobus average weekday ridership of 1A,B,E,Z; 2A; 3A; 3Y; 4A,B; 5A; 22A,B,C,F; and 25B. ART – Arlington Transit average weekday ridership of 41, 51, 52, 55, and 75. Ridership includes peak and non-peak periods.

Source: WMATA and Arlington County

**Express Buses: Loudoun County Transit, Fairfax Connector, and PRTC OmniRide**

With the implementation of tolling on I-66 in December 2017, the average weekday ridership of express buses show increases. The aggregate average weekday ridership of Loudoun County Transit, Fairfax Connector and PRTC OmniRide I-66 corridor routes, which run only during peak periods in contrary to railway and local bus services, increased 8 percent from February 2017 to February 2018 (Figure 5). The increase is in part due to new capacity funded by the I-66 Commuter Choice program as well as tolling on I-66, though data is insufficient to quantify the impact of each of these factors. At the transit provider level, Fairfax Connector and PRTC’s OmniRide experienced average weekday ridership increases of 32 percent and 58 percent respectively, between February 2017 and February 2018. The average weekday ridership of Loudoun County Transit I-66 corridor routes decreased by 12 percent between February 2017 and February 2018.

Figure 5: Average Weekday Ridership of I-66 Corridor (Express Buses)



Note: Loudoun County Transit I-66 Corridor Routes: 101-111, 201-211, 251-253, 301-309, 401-420, 501-511, 601-612, 651-654, 701-708, 800D, and 801-822. PRTC OmniRide I-66 Corridor Routes: LH, G-100, G-200, M-100, and M-200. Fairfax Connector I-66 Corridor Routes: 599 and 699. These services extend peak periods only.

While public transportation systems transport significant numbers of commuters from the Washington, D.C. suburbs to downtown, overall transit ridership in Northern Virginia has shown a gradual decline, which is influenced by employer transit benefits, transit service reliability, telework, and real estate development, among others.<sup>7</sup> However, new commuter and express bus services supported by the I-66 Commuter Choice program have demonstrated stable demand and are expected to grow.

**Public Transit Services Funded by the I-66 Commuter Choice Program**

In fiscal year 2017, the I-66 Commuter Choice program began supporting new and enhanced public transportation services in the corridor. The FY2017 program funded 10 projects worth \$9.8 million, in Arlington, Fairfax, Loudoun, and Prince William counties and the City of Falls Church (Figure 6).

Public transportation services added to the I-66 corridor included:<sup>8</sup>

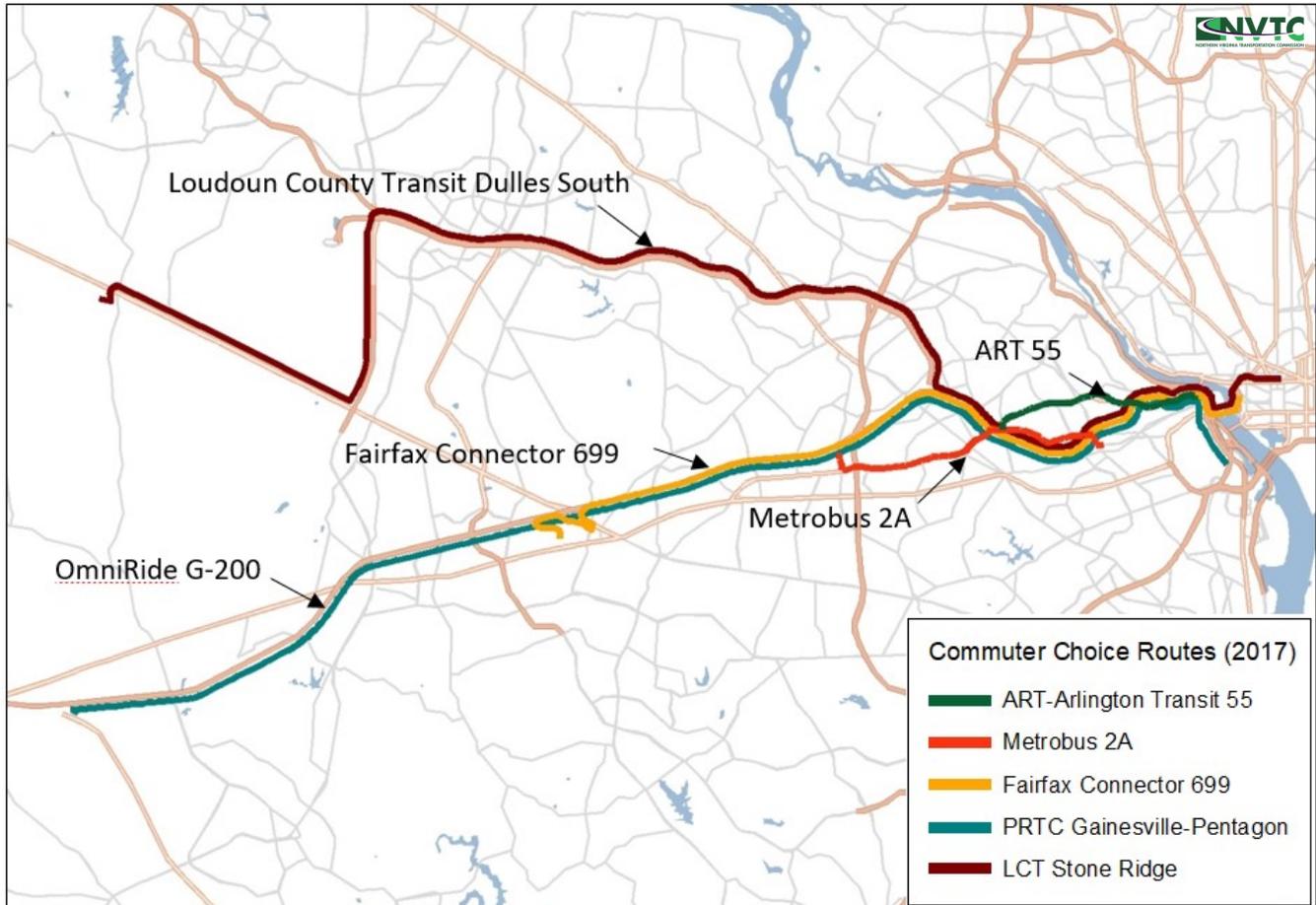
- Arlington County Peak Period Service Expansion to Metrobus Route 2A (Washington Blvd.-Dunn Loring). The project, which started in June 2017, features improvements in peak time headways from 15 to 10 minutes.

<sup>7</sup>WMATA (2017).

<sup>8</sup>In FY2017, Commuter Choice program also supported following projects: Arlington Bus Stop Consolidation and Accessibility Improvements; City of Falls Church Expanded Transit Access; Arlington Multimodal Real-Time Transportation Information Screens; Loudoun County Transportation Demand management; and Arlington Expanded TDM Outreach. Implementations of these projects are at various stages. They are beyond the scope of this report since they are not public transportation services.

- ART – Arlington Transit Route 55 Peak Period Service Expansion. The project, which started in June 2017, features peak time headway improvement from 16 to 12 minutes.
- Fairfax Connector Route 699 (Government Center-Downtown DC). The project, which started in December 2017, features 10 service runs each peak period.
- Loudoun County Transit Stone Ridge Enhanced Service. The project, which opened in July 2017, features 11 service runs from the newly constructed Stone Ridge II park and ride lot.
- PRTC OmniRide Gainesville to Pentagon Commuter Service. The project, which started in December 2016, features five service runs each peak period.

**Figure 6: Bus Routes Supported by Commuter Choice Program (2017)**



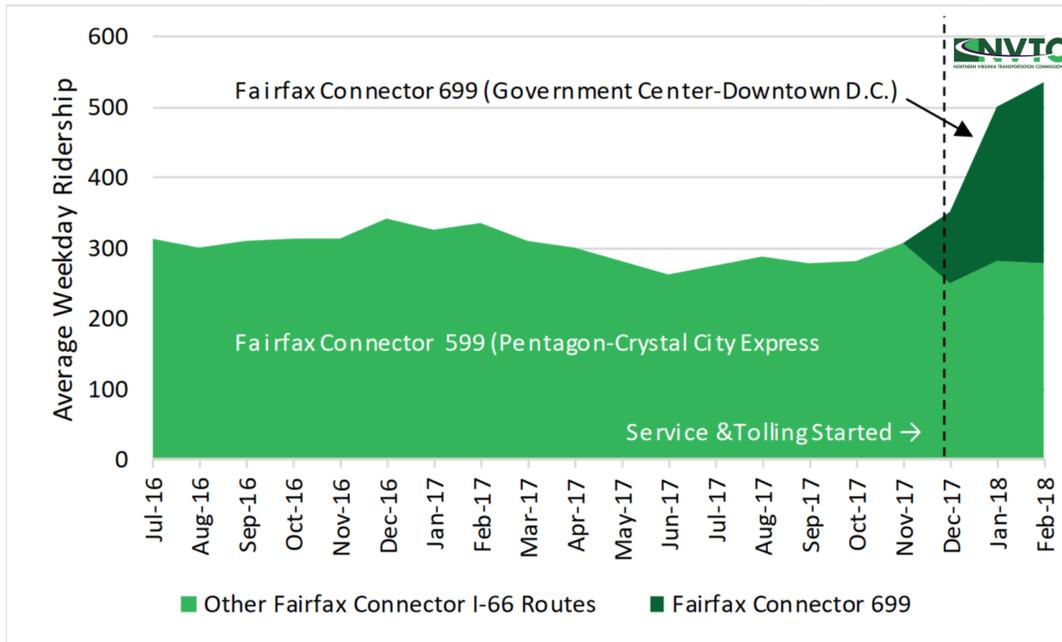
Source: NVTC

The public transportation service capacity added in FY2017 through the I-66 Commuter Choice program has met with stable demand. A ramp-up in demand is expected in the coming years. The ridership trends of the new and enhanced services compared to the existing public transportation services provided by each operator in the corridor are detailed below.

**Fairfax County Connector**

Fairfax County Connector started the 699 (Government Center – Downtown D.C.) service concurrent with the implementation of tolling on I-66 inside the Beltway in December 2017. The average weekday ridership grew over the first three months of operation (**Figure 7**). With demand for the existing 599 (Pentagon-Crystal City Express) service stable, the addition of the 699 route increased the Connector’s average weekday ridership in the corridor by 58 percent in February 2018 compared to February 2017. These services run only during peak periods.

Figure 7: Fairfax Connector I-66 Corridor Services Average Weekday Ridership

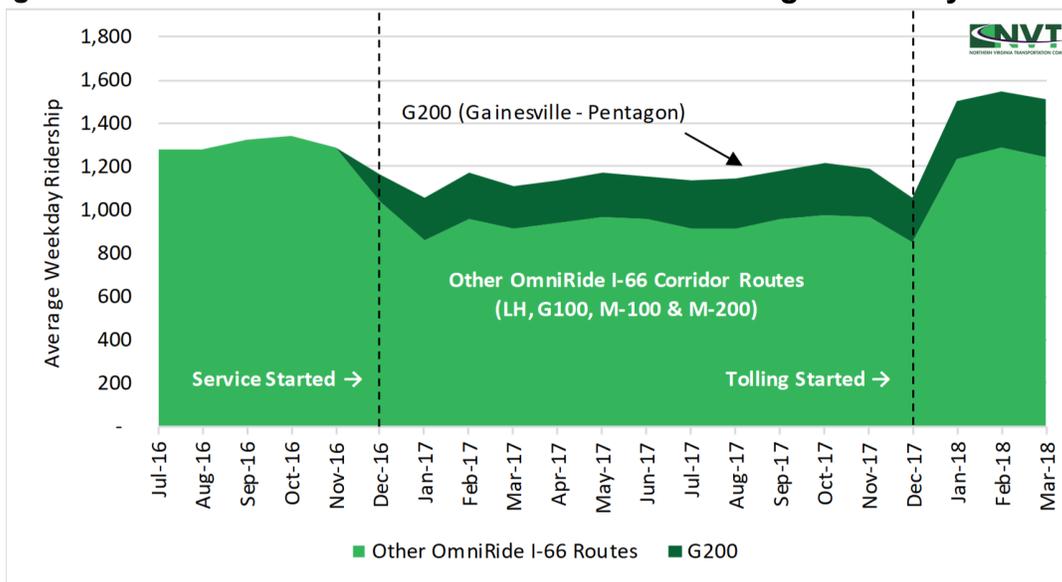


Note: Services only during peak periods.  
 Source: Fairfax County

PRTC OmniRide

Supported by the I-66 Commuter Choice program, PRTC’s G200 service (Gainesville – Pentagon) began in December 2016. Ridership was stable through December 2017 (Figure 8). After I-66 tolling started, aggregate ridership of PRTC’s I-66 corridor services experienced a significant increase. Overall, I-66 Corridor Routes of OmniRide increased by 32 percent from February 2017 to February 2018. These services run only during peak periods.

Figure 8: PRTC OmniRide I-66 Corridor Services Average Weekday Ridership

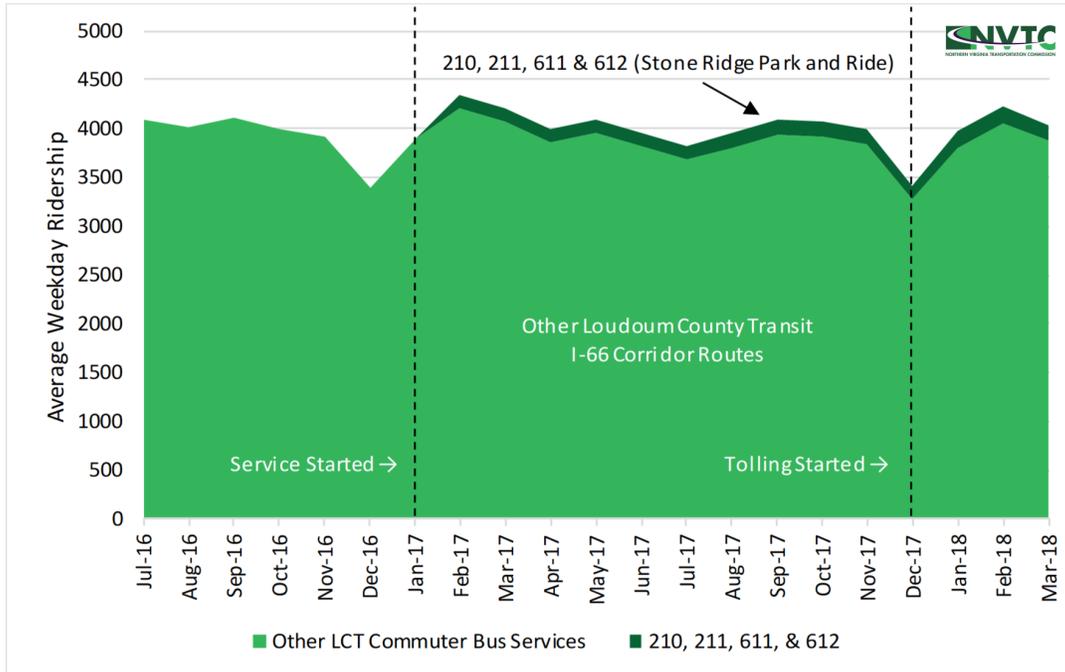


Note: Other OmniRide I-66 corridor routes are LH, G-100, M-100, & M-200. Services are only during AM and PM peak periods.  
 Source: PRTC

**Loudoun County Transit**

Loudoun County Transit also improved its commuter bus services with the addition of the newly built Dulles South park and ride lot and two bus routes each peak period, starting in February 2017. Ridership on the new routes – 210, 211, 611 and 612 – was 26 percent higher in February 2018 compared to February 2017 (**Figure 9**). These services run only during peak periods.

**Figure 9: Loudoun County Transit I-66 Corridor Services Average Weekday Ridership**



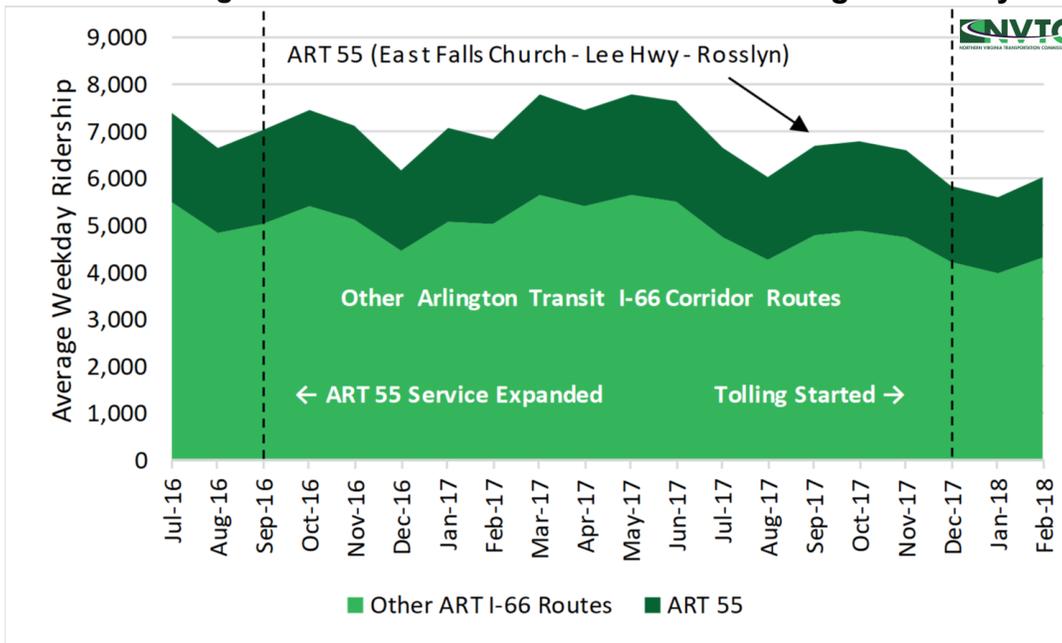
Note: Other Loudoun County Transit I-66 Corridor Routes are 101-111, 201-209, 251-253, 301-309, 401-420, 501-511, 601-610, 651-654, 701-708, 800D, & 801-822. Services are only during AM and PM peak periods.

Source: Loudoun County Transit

**ART – Arlington County Transit**

ART expanded its 55 bus service frequency to every 12 minutes during the AM and PM peak periods, starting June 2017. I-66 corridor routes of ART, which consists of 41, 51, 52, 55, and 75 decreased by 12 percent from February 2017 to February 2018. The ridership of ART 55, with the added service frequency, decreased by 7 percent during the same period (**Figure 10**). The services run during peak and non-peak periods.

Figure 10: ART - Arlington Transit I-66 Corridor Services Average Weekday Ridership

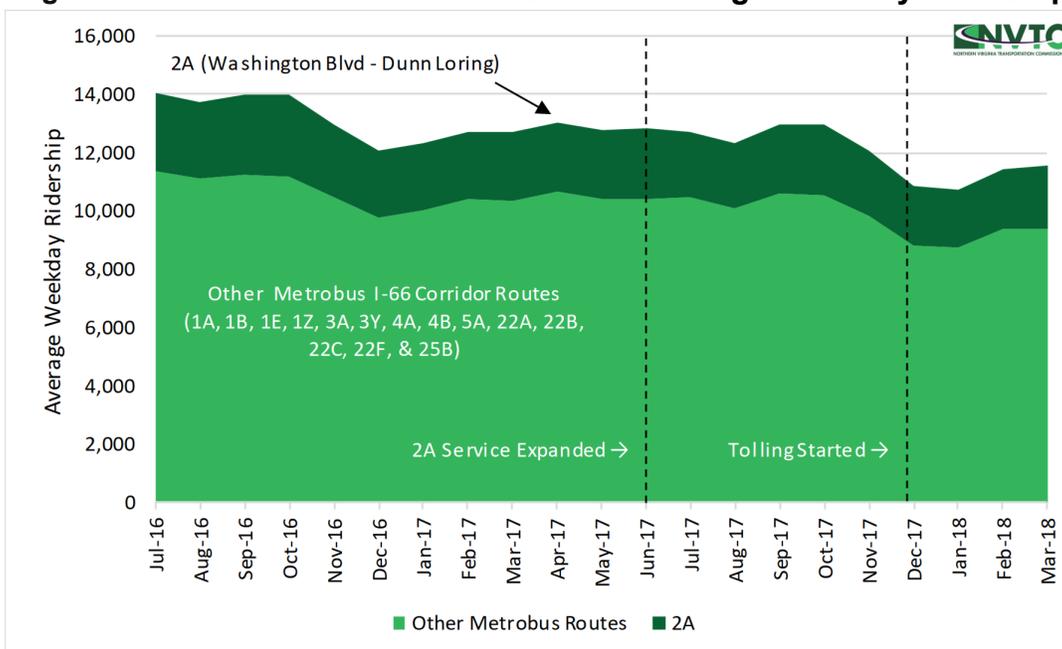


Note: Other Arlington County Transit I-66 Corridor Routes are 41, 51, 52, and 75. Services extend peak and non-peak periods.  
Source: Arlington County

Washington Metropolitan Area Transit Authority

Metrobus 2A (Washington Boulevard – Dunn Loring), frequency was expanded from every 15 to 10 minutes during peak periods. Average weekday ridership decreased by 10 percent from February 2017 to February 2018, with the increase in 2A’s service frequencies. Figure 11 summarizes the route’s average weekday ridership from December 2016 to February 2018. The services run during peak and non-peak periods.

Figure 11: Metrobus I-66 Corridor Services Average Weekday Ridership



Note: Other I-66 Corridor Routes are 1A,B,E,Z; 3A; 3Y; 4A,B; 5A; 22A,B,C,F; and 25B. Services extend peak and non-peak periods.  
Source: WMATA

## Impact of I-66 Tolling on Express Bus Running Time

Tolling on I-66 affects public transportation not only in terms of ridership but also the running times of bus services using the facility. Vehicular speed on I-66 inside the Beltway increased by 15 percent from February 2017 to February 2018<sup>9</sup>. Available data and anecdotal evidence strongly suggest that running times of express bus services using I-66 have also improved.

Transit operators noted the following service impacts:

- Loudoun County Transit commuter bus drivers are reporting easier travel into and out of the District of Columbia.
- Fairfax County Connector 599 (Pentagon – Crystal City Express) buses are experiencing improved running time on AM and PM trips, while 699 (Government Center – Downtown D.C.) buses are operating within expected running time parameters.
- PRTC OmniRide is experiencing improved reliability and running times for services using I-66. Prior to tolling, OmniRide was using I-495 express lanes and I-395 HOV lanes for services from western Prince William County to the Pentagon instead of I-66 and Route 110, because they offered comparable travel time and greater reliability. After tolling started, OmniRide switched these services to I-66/Route 110 due to improved run time reliability and time savings of up to 15 minutes compared to I-495/I-395.
- Average weekday running time of Metrobus 5A, which includes time spent on roads other than I-66, improved by up to 7 percent from December 2016 to December 2017. WMATA will continue to monitor the performance of Metrobus routes using the facility.

## NEXT STEPS

This report highlights the need for more information to evaluate the impact of tolling on the I-66 Commuter Choice program and, more broadly, public transportation services along the I-66 corridor. NVTC will continue to work with regional and jurisdictional partners to monitor the performance of public transportation services in the corridor. Staff recommend the following next steps:

- Continuation of periodic mode-share surveys of person throughput in the corridor. The next survey currently is scheduled for 2019, with funding from VDOT.
- Regular, biannual collection of ridership statistics for public transportation serving the corridor.

<sup>9</sup>Virginia Department of Transportation, February 2018 Performance Report, I-66 Express Lanes Inside the Beltway ([www.66expresslanes.org/documents/february\\_2018\\_performance\\_report\\_for\\_i-66\\_express\\_lanes\\_inside\\_the\\_beltway.pdf](http://www.66expresslanes.org/documents/february_2018_performance_report_for_i-66_express_lanes_inside_the_beltway.pdf))