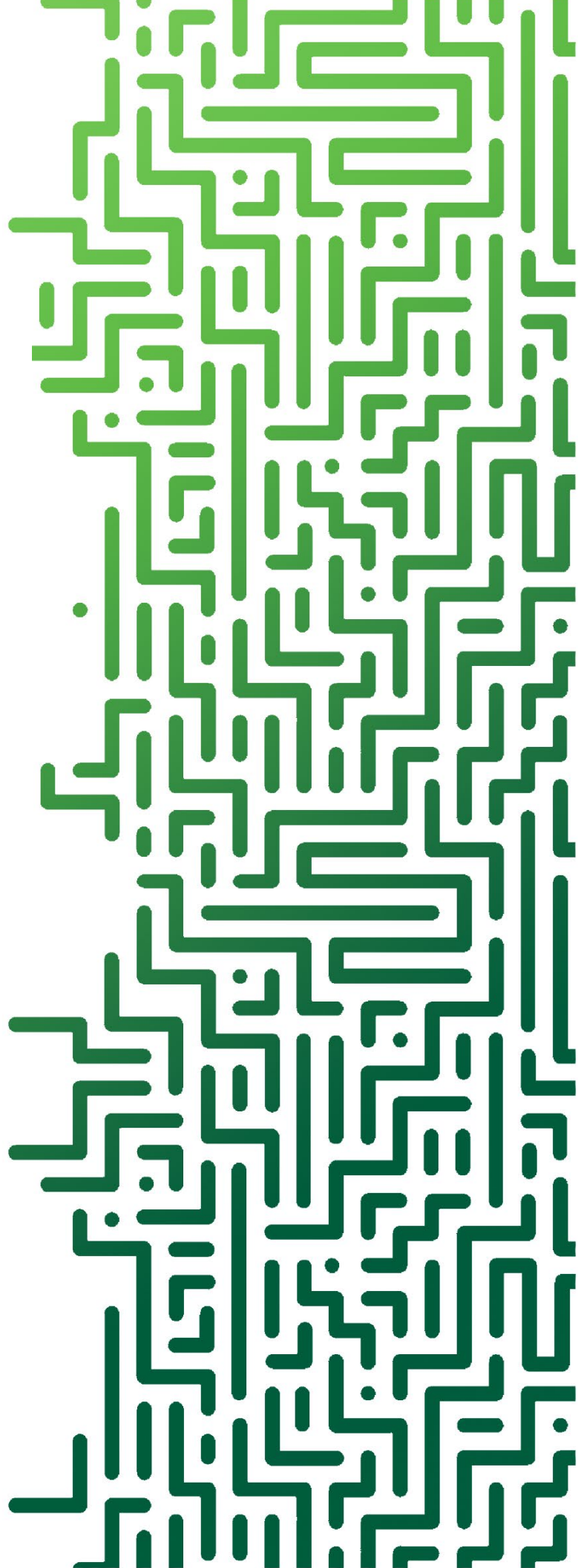




**2024
Commuter
Choice Annual
Report
Technical
Memorandum
October 2024**

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Executive Summary

This report describes how the Northern Virginia Transportation Commission (NVTC) calculated the benefits of projects funded to date by the Commuter Choice program. It includes a background on the program, provides a computation of the throughput increase for each project that was in service in spring 2024 based on the performance target/reporting requirements specific to the project, outlines the approach to estimating the regional benefits of Commuter Choice funded projects and calculates those benefits. NVTC found that the 24 projects reporting performance data for spring 2024 provided 7,573 passenger trips each weekday through the I-66 Inside the Beltway and I-395/95 corridors. Further, NVTC estimated the following benefits to date of Commuter Choice funding using nationally recognized tools and factors applied to the usage of each project and how commuters shifting to the project would be likely to adjust their travel:

- 1,322,253 hours of total travel time savings for commuters, amounting to \$46,402,516 in regional economic benefits from reduced travel delay
- 136,776,841 fewer vehicle miles traveled
- \$18,533,091 in fuel expenditures saved
- 205 automobile crashes avoided
- A 71% reduction in greenhouse gas emissions
- 7,091,805 total project trips

Appendix A includes a listing of all projects included in the regional benefits estimator. Appendix B includes a bi-annual update to regional cordon count data and travel trends supplied by the Metropolitan Washington Council of Governments (MWCOC).



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1. Introduction

This memorandum describes how the Northern Virginia Transportation Commission (NVTC) calculated the benefits of projects funded to date by the [Commuter Choice program](#) as identified in the Project Performance portion of the [2024 Commuter Choice Annual Report](#). Table 1 summarizes the number of projects funded through Commuter Choice through fiscal year (FY) 2024. These projects were evaluated primarily on their ability to support corridor improvement goals of moving more people (also referenced as “maximizing person throughput”), improving mobility, supporting new and diverse travel choices, and enhancing transportation safety and travel reliability.

Table 1: Commuter Choice Funded Projects

Category	Number of Projects
Total Commuter Choice Projects	62
I-66 Commuter Choice since FY 2017	40
I-395/95 Commuter Choice since FY 2020	22
Projects with Performance Included in the FY 2024 Annual Report	
Projects in Service in Spring 2024, I-66	13
Bus Service	7
Bus Capital	2
Access to Transit	2
Transportation Demand Management	2
Projects in Service in Spring 2024, I-395/95	11
Bus Service	9
Park-and-Ride	1
Transportation Demand Management	1

The 2024 Annual Report presents Commuter Choice projects’ benefits in two ways. For one, the report presents the people moved through the I-66 Inside the Beltway and I-395/95 corridors each weekday by projects active in spring 2024, the time of year that NVTC’s project agreements specify annual performance data collection. Moving more people is one of the overarching improvement goals and serves as a reasonable proxy for the attractiveness and effectiveness of the transportation improvements created. In spring 2024, 13 operational I-66 Commuter Choice projects provided 1,710 passenger trips through the corridor each weekday, while 11 operational I-395/95 Commuter Choice projects provided 5,863 passenger trips each weekday, for a total of 7,573 trips each weekday across the two program corridors.

The 2024 Annual Report also estimates the benefits that Commuter Choice projects have provided to Northern Virginia’s economy and quality of life since the first projects began operation in 2017.



The total benefits, estimated using nationally recognized tools and factors applied to the usage of each project and how commuters shifting to the project would be reasonably likely to adjust their travel, are:

- 1,322,253 hours of total travel time savings for commuters
- \$46,402,516 in regional economic benefits from reduced travel delay
- 136,776,841 fewer vehicle miles traveled
- \$18,533,091 in fuel expenditures saved
- 205 automobile crashes avoided
- A 71% reduction in greenhouse gas (GHG) emissions relative to drive-alone travel
- 7,091,805 total project trips

2. Background

[Commuter Choice](#) invests toll revenues in public transit and other multimodal transportation projects along two expressway corridors, I-66 Inside the Beltway and I-395/95, that benefit the corridors' toll payers by moving more people and expanding transportation options. NVTC manages Commuter Choice in partnership with the Commonwealth of Virginia and, on the I-395/95 corridor, the Potomac and Rappahannock Transportation Commission (PRTC).

Commuter Choice Awards to Date

Through FY 2024, Commuter Choice has funded 62 projects, some of which have received multiple installments of funding support, totaling \$156.3 million of reinvestment of toll revenues into multimodal improvements. About \$70 million has been awarded for long-lived capital assets including bus purchases, park-and-ride lot construction and capital improvements to bus stops that will benefit commuters for years to come. I-66 Commuter Choice funded 40 projects in five rounds of funding while I-395/95 Commuter Choice funded 22 projects in three rounds of funding. The totals do not include the \$22.1 million I-66 Commuter Choice FY 2025-2026 Program of Projects that was approved in June 2024 for implementation beginning in FY 2025.

All Commuter Choice projects are assigned to one of the following categories, even though many projects include elements of more than one category:

- **Bus Service** – Up to 24 months of operating subsidies for new commuter, local and on-demand bus routes or improvements to existing routes, such as more frequent service or route extensions. New and enhanced bus service projects often include the purchase of buses needed to operate the expanded service, while some include improvements to bus stops or park-and-ride facilities served by the route.
- **Bus Capital** – Capital-only improvements to bus routes or corridors to bolster ridership, such as through improvements to bus stops to enhance passenger comfort and safety, the purchase of larger buses to meet high ridership demand and/or the implementation of bus priority treatments such as dedicated lanes and signal priority.
- **Access to Transit** – Pedestrian and bicycle access improvements, such as bikeshare system expansions, from residential areas to nearby transit stations, hubs and stops.
- **Rail Capital** – Capital improvements to Metrorail and Virginia Railway Express facilities, such as construction or expansion of rail stations.



- **Park and Ride** – Construction or enhancement of park and ride lots serving commuter buses, vanpools and carpools.
- **Transportation Demand Management (TDM)** – Campaigns to reduce drive-alone commute trips. While earlier projects focused on education and outreach on alternative options, NVTC now requires standalone TDM projects to center on direct incentives to commuters to entice changes in their travel behavior.
- **Roadway Operations** – Operational and safety strategies and capital improvements to roadways that parallel or connect with I-66 inside the Beltway or I-395/95.

In all, Commuter Choice’s \$156.3 million total award has purchased, established or supported:

- 42 buses to operate expanded services
- 29 bus service improvements
- 14 new express bus routes
- 6 commuter incentive programs
- 4 rail station enhancements
- 3 park-and-ride lots
- 1 bus rapid transit line

Project Selection Process

NVTC’s Commuter Choice project selection process strongly emphasizes the outcomes of a multiple-measure technical evaluation approach. The technical evaluation process effective¹ in FY 2024 (Figure 1 below) allots 75 of the 100 possible points to factors related to how well proposed projects meet corridor improvement goals. The factors capture:

- The efficiency by which the project would move more people,
- The travel time savings that commuters would realize from using the project relative to a non-tolled driving trip,
- The extent to which the project would improve connections between modes of transportation,
- The extent to which the project would improve access to regional activity centers, and
- The ability of the project to absorb car trips that might be diverted onto parallel streets due to tolling or high-occupancy vehicle restrictions.

Other criteria in the process capture the project’s cost effectiveness (in terms of the technical merit score relative to the funding request, taking the useful life of project elements into account) and whether the proposed project is the applicant’s top priority out of those submitted for funding consideration.

¹ Adopted in 2022. However, prior processes also allotted the most emphasis to the Technical Merit factors that derive from the corridor improvement goals [identified in the two corridor programs’ governing memoranda of agreement](#).

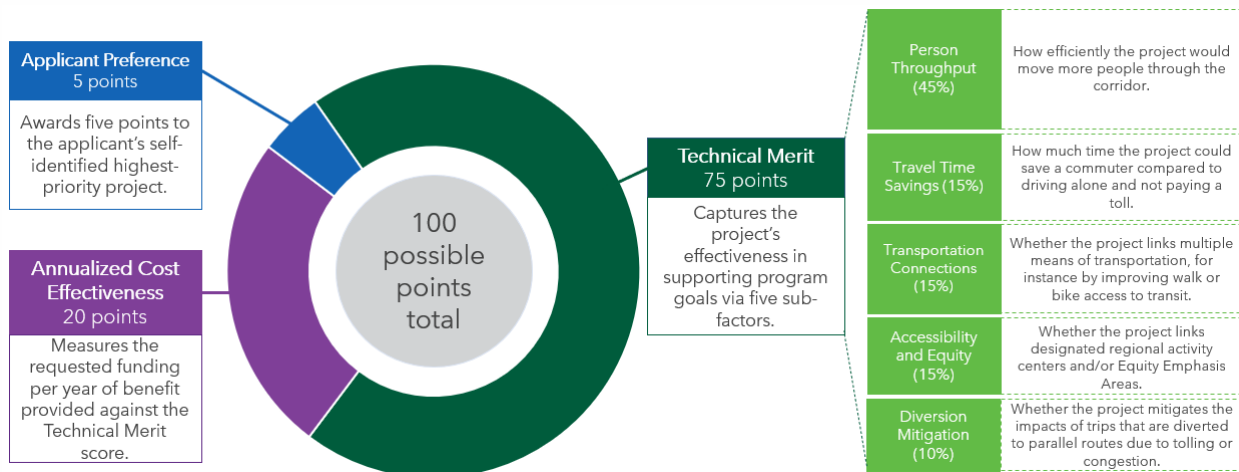


Figure 1: Commuter Choice Technical Evaluation Process

NVTC's Strategies to Maximize Program Benefits

NVTC has implemented program-wide strategies to maximize the benefits of Commuter Choice funds to I-66 Inside the Beltway and I-395/95 toll payers, including:

- Limiting operations projects to a maximum of 24 months of support at a time.** Transit service improvements, bikeshare operations, TDM campaigns and any other projects with ongoing operating expenses must successfully re-compete under a subsequent call for projects to receive a further installment of operating support. The 24-month limit provides grant recipients a reasonable amount of time to develop a viable service but limits the program's commitments where services cannot meet performance expectations despite good-faith efforts by grant recipients.
- Mandating measurable outcomes across project types.** For TDM projects, NVTC found that generalized outreach and education campaigns did not allow for ready quantification of the number of commuters that began using transit or alternatives to driving alone as a result of the campaign. NVTC therefore now requires standalone TDM strategies to focus on direct incentives to commuters, as these can be targeted specifically to toll payers and have directly measurable usage outcomes that do not require surveying.
- Encouraging proposals for capital projects with long-lived benefits.** Capital projects that support the program's goals can benefit toll payers over decades of useful life and the overall project benefits are less susceptible to short-term fluctuations in travel demand. Eligible types of capital project include construction or expansion of park and ride lots, bus stop enhancements, transit priority improvements and improvements to Metrorail and/or Virginia Railway Express facilities. About \$70 million has been awarded to date for long-lived capital assets and improvements, some of which were in the process of being implemented in spring 2024.

Annual Performance Requirement

The Memoranda of Agreement (MOA) with the Commonwealth of Virginia that govern the Commuter Choice program (dated [2021](#) for I-66 Commuter Choice and [2022](#) for I-395/95 Commuter Choice)



require NVTC and, for the I-395/95 corridor, PRTC, to submit an annual report on Commuter Choice to the Commonwealth Transportation Board. The MOAs for both corridors require the report to address the following:

1. *A description of projects selected for funding in the past fiscal year and the benefits that were the basis for evaluation and selection of each such project;*
2. *A review of projects funded in past fiscal years describing the degree to which the expected benefits were realized or are being realized;²*
3. *For any project that is not providing substantially similar benefits to those that were the basis for its evaluation and selection, an evaluation of the viability of a plan to modify the project or redeploy the assets to other eligible projects that are expected to provide greater benefits; and*
4. *Proposed uses of residual, unobligated balances of program funds carried over from prior years and interest earned on such funds.*

The summary figures in the Project Performance portion of NVTC's [2024 Commuter Choice Annual Report](#) present both the average weekday passenger trips (person throughput)³ on projects in service in spring 2024 and an estimate of the broader range of Commuter Choice projects' benefits to date, based on project person-throughput figures reported each year and comparing travel using each respective project relative to driving alone. The person-throughput results in particular, as summarized in the Annual Report and detailed in this memorandum, allow for an assessment of how well funded projects are realizing their anticipated benefits:

- Maximizing the number of people moving through the corridor is one of the two overarching improvement goals in each corridor. Person-throughput increases also serve as a reasonable proxy for the less tangible improvement goals of improving mobility, expanding transportation options and enhancing transportation safety and travel reliability.
- Each project's estimated person-throughput increase is therefore the clearest indication of its anticipated ability to support the corridor improvement goals and benefit toll payers, as well as a clear target for measuring actual project performance. The estimate is a significant part of the eligibility review (in terms of assuring that the project will benefit toll payers) and technical evaluation.⁴ For funded projects, this throughput increase is then specified in the project agreement and the performance measures identified in the agreement are intended to allow NVTC to compute an actual increase from the performance data provided by the recipient.

² Required beginning in 2020 for the I-66 corridor program and 2022 for the I-395/95 corridor program. NVTC now reports performance data for both corridors.

³ Defined as the number of additional people moving through the corridor – including by expressway, parallel commuter routes and/or parallel rail transit lines – as a result of the project.

⁴ NVTC works closely with applicants to ensure that the throughput estimates carried into the eligibility review and technical evaluation are reasonable, using transit ridership forecasting tools, past project performance and professional judgment.



The [2024 Commuter Choice Annual Report](#) summarizes the status of each of the active projects included in the computation and, in cases of projects that are not performing at or close to targets, describes steps NVTC and recipients are taking to address the performance concerns.

The estimates of the total number of trips taken on projects to date and reductions in vehicle-miles traveled, travel time and automobile crashes, meanwhile, help depict the program's support for the mobility, safety and reliability aspects of the improvement goals. The benefit estimates, the approaches to which are detailed in Section 4, are high-level and strictly contextual. Most would be difficult to measure empirically; individual projects are not evaluated or tracked against them.

The throughput results and benefit estimates provide a comprehensive view of Commuter Choice's benefits to I-66 and I-395/95 toll payers and more broadly to Northern Virginia's economy and quality of life.

Typical Project Performance Reporting Requirement

Grant recipients are required to provide performance data to NVTC annually to determine the actual increase in person throughput for each funded project.⁵ Each project agreement identifies specific performance measures that will allow NVTC to compute the throughput increase, as well as days for which to report data to provide a representative picture of usage of the project. Where possible, the performance reporting parameters are consistent among similar projects. An example of typical performance reporting parameters for a bus service enhancement is as follows:

- Performance Measures: Report average morning peak-period inbound ridership as well as average total daily ridership for the expansion trips.
- Collection Period: Data should be collected over a two-week period in March or April. Chosen period should not include any holiday periods and the weekday average should be calculated from Tuesdays, Wednesdays, and Thursdays during the period.
- Reporting: Report data to NVTC in a technical memorandum outlining the following:
 1. Data collection methodology
 2. Data collection dates
 3. Results – data
 4. Notes (if necessary)

Most projects, regardless of category, specify a similar data collection period. Mid-week (Tuesday, Wednesday, or Thursday) days in March and April typically represent commute travel at its peak, given schools in session and no major holidays.

Summary Findings

Table 2 summarizes morning peak period and daily ridership for the projects that were in service in spring 2024 by corridor. The daily totals correspond to those in the [2024 Commuter Choice Annual Report](#)'s Project Performance section. As Commuter Choice only funds new and enhanced transit services, facilities and other travel options, NVTC assumes the ridership to represent additional trips in each corridor ("person throughout improvements").

⁵ For transit service projects, the reporting requirement applies to active service improvements. Capital and certain other project types require reporting for five years from opening or implementation of the project.



Table 2: Person Throughput Improvements for Projects in Service in FY 2023

Metric, Operational and Completed Projects	Both Corridors (I-66 and I-395/95)	I-66 Corridor Projects Only	I-395/95 Corridor Projects Only
Total Actual Throughput Improvement, AM Inbound	2,143	892	1,251
Total Weekday Ridership Increase	7,573	1,710	5,863

Table 3 presents the estimated program-wide benefits by corridor since Commuter Choice began in 2017.

Table 3: Estimated Program Benefits by Corridor Since 2017

Metric	Both Corridors (I-66 and I-395/95)	I-66 Corridor Projects Only	I-395/95 Corridor Projects Only
Total Travel Time Savings for Project Users (hours)	1,322,253	787,707	534,545
Total Travel Time Cost Savings	\$46,402,516	\$27,466,557	\$18,935,959
Total Vehicle Miles Traveled Reduction	136,776,841	81,398,957	55,377,884
Total Fuel Expenditure Savings for Commuters	\$18,533,091	\$10,964,563	\$7,568,528
Total Vehicle Crashes Avoided	205	120	85
Percentage GHG-Equivalent Emissions Reduction	71%	71%	71%
Total Project Trips	7,091,805	2,894,403	4,197,402



3. Throughput Computation Methodology and Results

NVTC computed the person throughput increase for each project that was in service in spring 2024 based on the performance target/reporting requirements specific to the project and data provided by each grant recipient. The projects are broken out below by type; not all possible types of project are represented by those currently in service.

Descriptions of all Commuter Choice-funded projects within each category, including those that did not report performance data because they have not yet been fully implemented, are provided on the [Funded Projects page](#) of the [Commuter Choice website](#).

Bus Service Projects: New Routes

All new bus routes that were started with Commuter Choice funding provide only peak-period, peak-direction service (i.e., inbound toward Arlington or D.C. during the morning rush hours and outbound in the reverse direction in the afternoon rush hours). NVTC obtained ridership data from grant recipients at the trip level or aggregated by morning or afternoon service. The calculation methodology, actual throughput, and goal throughput for the nine new bus service projects that were active in spring 2024 are shown in Table 4. Descriptions of all Commuter Choice-funded bus service improvements are included in the [2024 Commuter Choice Annual Report](#).

Table 4: FY 2024 Person Throughput Improvements for New Bus Service Projects

Project	Grantee	Corridor	Calculation Method	Person Throughput		
				AM Inbound		Daily Actual
				Goal	Actual	
Fairfax Connector Route 698: Vienna/Fairfax-GMU Station to the Pentagon	Fairfax County	I-66	Averages of reported AM and daily midweek ridership, April 2-4 and 9-11, 2024	118	160	308
Loudoun County Transit Route 284/684: Stone Ridge Park-and-Ride to the Pentagon	Loudoun County	I-66	Averages of reported AM and daily midweek ridership in April and May 2024	40	19	32
Loudoun County Transit Route 391: Harmony Park-and-Ride to Ashburn Station	Loudoun County	I-66	Averages of reported AM and daily midweek ridership in April and May 2024	50	10	19
Loudoun County Transit Route 483/883: Harmony Park-and-Ride to Downtown Washington, D.C.	Loudoun County	I-66	Averages of reported AM and daily midweek ridership in April and May 2024	30	31	60

Project	Grantee	Corridor	Calculation Method	Person Throughput		
				AM Inbound		Daily Actual
				Goal	Actual	
OmniRide Route 612: Gainesville to the Pentagon	OmniRide	I-66	Averages of reported AM and daily midweek ridership, April 25-27 and May 2-4, 2024 *	160	250	457
OmniRide Route 622: Haymarket to Rosslyn	OmniRide	I-66	Averages of reported AM and daily midweek ridership, April 25-27 and May 2-4, 2024 *	40	60	113
Fairfax Connector Route 396: Backlick North Park and Ride to the Pentagon	Fairfax County	I-395/95	Averages of reported AM and daily midweek ridership, April 2-4 and 9-11, 2024	177	172	376
OmniRide Route 942: Staffordboro to the Pentagon	OmniRide	I-395/95	Averages of reported AM and daily midweek ridership, April 16-18 and 23-25, 2024	161	169	311
OmniRide Route 943: Staffordboro to Downtown Washington, D.C.	OmniRide	I-395/95	Averages of reported AM and daily midweek ridership, April 16-18 and 23-25, 2024	121	127	267

* A portion of the route’s ridership gain since November 2022 is being attributed to a TDM project, Prince William County’s “Fare Buy-Down on I-66 Commuter Bus Service”, which has temporarily lowered fares on the route since the new I-66 Outside the Beltway Express Lanes opened.

Bus Service Projects: Route Enhancements

Commuter Choice supports a range of enhancements to existing bus routes, including:

- Route extensions to serve additional origins, destinations and/or transfer points
- A discrete number of additional trips (e.g., two additional morning peak-period trips and two additional afternoon peak-period trips)
- Shorter headways (e.g., buses arrive every 10 minutes during rush hours rather than every 15 minutes)



Generally, all bus service enhancement projects are required to report average weekday ridership, though the throughput computation approach varies depending on the nature of the enhancements and the data that grantees provide. The nature of the service enhancement, calculation methodology, actual throughput, and goal throughput for the seven enhanced bus service projects operating in Spring 2024 are summarized in Table 5.

Table 5: FY 2024 Person Throughput Improvements for Enhanced Bus Service Projects

Project	Grantee	Corridor	Calculation Method	Person Throughput Increase		
				AM Inbound		Daily Actual
				Goal	Actual	
Loudoun County Transit Route 281/681 Service Enhancement: Stone Ridge Park-and-Ride to Downtown Washington, D.C.	Loudoun County	I-66	Averages of reported AM and daily midweek ridership on the expansion trips in April and May 2024	76	55	101
DASH Line 35 Service Enhancement: Van Dorn Street Station to the Pentagon	City of Alexandria / DASH	I-395/95	Averages of reported AM and daily ridership, April 17-19, 22-26 and 29-30, 2024, relative to projected ridership absent the (all-day) service expansion	212	299	3,475
DASH Line 36A/B Service Enhancement: Mark Center to Potomac Yard-VT Station	City of Alexandria / DASH	I-395/95	Averages of reported AM and daily ridership, April 17-19, 22-26 and 29-30, 2024, relative to projected ridership absent the (all-day) service expansion	138	152	733
Fairfax Connector Route 371 Service Enhancement: Lorton to Franconia-	Fairfax County	I-395/95	As of spring 2024, only a bikeshare expansion that was included in the overall project scope was active. Figures reflect average AM peak trips to the Franconia-	66	0	2



Project	Grantee	Corridor	Calculation Method	Person Throughput Increase		
				AM Inbound		Daily Actual
				Goal	Actual	
Springfield Station			Springfield Station and daily trips at any time to/from it, April 9-11 and 16-18, 2024			
OmniRide Route 52 (Route 1 Local) Service Enhancement: Quantico to Woodbridge Station	OmniRide	I-395/95	Averages of reported AM and daily midweek ridership on the expansion trips, April 16-18 and 23-25, 2024	16	35	125
OmniRide Route 95 (Prince William Metro Express) Service Enhancement: Dale City to Franconia-Springfield Station	OmniRide	I-395/95	Averages of reported AM and daily midweek ridership on the expansion trips, April 16-18 and 23-25, 2024	24	51	118
OmniRide Route 972 Service Enhancement: Dale City to Ballston	OmniRide	I-395/95	Averages of reported AM and daily midweek ridership on the expansion trips, April 16-18 and 23-25, 2024	42	59	82

Bus Capital

Two bus capital projects, both bus stop improvement projects, reported performance information for FY 2024, as shown in Table 6.

Table 6: FY 2024 Person Throughput Improvements for Bus Capital Projects

Project	Grantee	Corridor	Calculation Method	Person Throughput		
				AM Inbound		Daily Actual
				Goal	Actual	
Bus Stop Consolidation	Arlington County	I-66	Weekday ridership growth at improved bus stops from the pre-implementation baseline (March 2018) to FY24 (Q3 data for Metrobus routes, Q4 data for Arlington Transit routes); AM peak assumed to be half of total increase	15% increase	33	67
CUE Access and Technology Improvements	City of Fairfax	I-66	For weekday AM peak, growth in alightings at Vienna/Fairfax-GMU Station from April 2022 (pre-implementation) to April 2024; for weekday total, doubled change in total AM peak boardings and alightings at same station	50	33	106

Access to Transit

Two access to transit projects, both bikeshare expansions, reported performance information for FY 2024, as shown in Table 7.

Table 7: FY 2024 Person Throughput Improvements for Access to Transit Projects

Project	Grantee	Corridor	Calculation Method	Person Throughput		
				AM Inbound		Daily Actual
				Goal	Actual	
City of Fairfax Bike Share Implementation	City of Fairfax	I-66	Average weekday AM peak trips to Vienna/Fairfax-GMU Station in April 2024	19	1	2
I-66 Corridor Vienna/Merrifield Bike Share Expansion	Fairfax County	I-66	Average AM peak trips to the Vienna/Fairfax-GMU or Dunn Loring-Merrifield station and daily trips at any time to/from either station, April 9-11 and 16-18, 2024	400	2	9

Park-and-Ride

One park-and-ride construction project reported performance information for FY 2024, as shown in Table 8.

Table 8: FY 2024 Person Throughput Improvements for Park-and-Ride Projects

Project	Grantee	Corridor	Calculation Method	Person Throughput		
				AM Inbound		Daily Actual
				Goal	Actual	
New Park and Ride Lot in Massaponax	Spotsylvania County	I-395/95	Average AM midweek ridership on OmniRide commuter bus service from the lot, April 30-May 2 and May 7-9, 2024, as well as on new vanpools that began from the lot in June 2024; daily total assumed to be twice the AM total	133	83	166



Transportation Demand Management (TDM)

Three TDM incentive campaigns reported performance information for FY 2024, as shown in Table 9.

Table 9: FY 2023 Person Throughput Improvements for TDM Projects

Project	Grantee	Corridor	Calculation Method	Person Throughput		
				AM Inbound		Daily Actual
				Goal	Actual	
Expanded TDM Outreach to the I-66 Corridor (I-66 ART Free Fares)	Arlington County	I-66	Year-over-year weekday ridership growth while the campaign was underway (Oct-Jan 2023-2024 vs. 2022-2023), controlled for year-over-year systemwide ridership growth in the preceding months	67	32	63
TDM Strategy – Fare Buy-Down on I-66 Commuter Bus Service	Prince William County	I-66	AM and daily midweek ridership growth, April 25-27 and May 2-4, 2024, relative to November 2022 pre-implementation baseline *	200	206	373
I-395/95 Corridor Vanpool Monthly Incentive	OmniRide	I-395/95	AM midweek averages from trip-level ridership data, March 21-30, 2023; daily total assumed to be twice the AM total	105	104	208

* A portion of the ridership gain since November 2022 is being attributed to operation of two OmniRide routes (612 and 622) whose net operating costs are also being supported by I-66 Commuter Choice.

4. Regional Benefits Estimation Approach and Results

NVTC followed the approaches outlined in this section to estimate the regional economic and quality of life benefits of Commuter Choice funding to date. The benefits were aggregated across all fiscal years since Commuter Choice began in 2017 and reflect all projects that reported person-throughput data in at least one of the years. [Appendix A](#) shows the projects included in the regional benefit estimations and for which fiscal years, based on when NVTC received throughput performance data from the recipient. NVTC performed the computations on a per-project, per-year basis.

The benefit estimates are intended to be high-level and contextual, as noted in Section 2. In lieu of being able to measure the benefits empirically, which would be challenging to impossible given their nature, NVTC estimated most by contrasting how commuters might reasonably travel with and without each project based on professional judgment, then aggregated the results across all projects and years. For some of the benefits, NVTC applied factors from nationally recognized tools to the savings in travel times and vehicle mileage. Fundamental to the analysis for each project was the identification of a sample morning peak-period commute trip from a hypothetical residential location to a hypothetical worksite that would plausibly involve travel on or via the project. NVTC constructed these trips consistent with the guidelines that it follows⁶ to estimate the travel time savings for proposed Commuter Choice projects, using Google Maps, transit timetables and information from Commuter Choice funding applications to develop the trips and obtain information on the length and duration of the legs. For consistency, the hypothetical worksites were all at an eastern point in Arlington County (Rosslyn, Crystal City or the Pentagon), unless the project was a transit service bringing commuters directly into downtown Washington, D.C.

The home-to-work trip without each project, referenced in the sections below as the “baseline” scenario, was assumed in all cases for simplicity and consistency to be a drive-alone, non-toll paying trip from end to end. The trip with the project, referenced as the “project” scenario, generally entailed one of the following:

- For most Commuter Choice transit improvements and transit-focused incentive campaigns: Drive-alone travel from the home location to a nearby transit stop, station or park-and-ride that the project is improving or serving, then a transit ride (on the project if it is a new or enhanced service) to the worksite, involving additional transfers if needed. If the project is a new or enhanced local bus route or a facility improvement in a walkable environment, where drive access would be unlikely, the home location is assumed to be adjacent to or a short walk from the project.
- For Commuter Choice vanpool-focused projects: Drive-alone travel from the home location to a transit stop, station or park-and-ride, then a vanpool ride (using toll roads as applicable) to the worksite.
- For Commuter Choice access to transit projects: Walk or bicycle travel using the project from the home location to a transit stop, station or park-and-ride facility, then travel via transit to reach the worksite. “Project” trips for access to transit projects do not include any driving.

Figure 2 illustrates examples of “baseline” and “project” trips.

Benefits arise where Commuter Choice projects afford commuters shorter travel times and/or less travel by personal vehicle than non-toll drive-alone trips, thus also reducing the incidence of automobile collisions, volume of automobile greenhouse gas emissions and commuters’ out-of-pocket fuel expenses, and generating economic benefits for the region. The operation of new or enhanced bus service carries greenhouse gas and vehicle miles traveled (VMT) implications, however, and the benefit estimations presented in this section appropriately account for these impacts of Commuter Choice-funded transit service improvements.

⁶ See Chapter 4 of the [Commuter Choice Recipient Handbook](#)

Commuter Choice Project Type	Baseline Trip Scenario Components	Project Trip Scenario Components
New or Enhanced Bus Service	Drive Alone	Drive Alone Transit
Vanpool	Drive Alone	Drive Alone Vanpool
Access to Transit	Drive Alone	Bike/Walk Transit

Figure 2: Comparison of Sample ‘Baseline’ and ‘Project’ Hypothetical Home-to-Work Trips

The sections below outline the computation approach for each category of benefit. All computations were performed at the level of each project for each year that data was available and then aggregated across all projects and years.

Annual Trips

NVTC first computed the project’s daily person-throughput increase from the performance data provided by the recipient for the year in question. In cases where only morning peak-period data was reported, NVTC doubled the morning peak-period result. To convert daily to annual trips, NVTC multiplied the daily figure by 261, the approximate number of non-holiday weekdays per year.⁷

Vehicle Miles Traveled Reduction

NVTC then computed the reduction in annual VMT associated with each project, reflecting the reduction in driving by the commuters that would use the project offset by any transit vehicle VMT increase generated by the operation of additional service. First, the “baseline” automobile VMT was computed as the product of two elements:

1. The one-way home-to-work driving distance. The one-way distance used in the calculation was the average length in miles of the Google Maps non-toll routing options; and
2. The number of annual project trips. As noted above, each “baseline” trip was assumed to be non-toll, drive-alone. The number of baseline annual vehicle trips is therefore the same as the number of annual trips on the project.

For any legs of the “project” trip involving automobile travel, the VMT was computed in the same fashion (i.e., the one-way driving distance from the assumed home location to the park-and-ride facility or transit station, generally no more than two miles, multiplied by the number of annual project trips). And for any trip legs involving vanpools, the number of individuals that would be making the trip was divided by 4, simulating the typical minimum occupancy of a vanpool.

⁷ While any individual commuter is unlikely to make the same trip on every possible workday of the year, there are assumed to be enough prospective riders making similar trips that the volume of daily trips is reasonably consistent over the course of the year.



If the Commuter Choice project included the operation of transit service, the attributable annual bus VMT was computed by the following steps, to reflect the full revenue operation of the service regardless of its usage:

- a. Estimate weekday morning bus VMT by multiplying the end-to-end bus route distance by the number of one-way weekday morning in-service bus trips supported by Commuter Choice;
- b. Convert the figure to daily by doubling it;
- c. Convert the figure to annual by multiplying by 261, the approximate number of non-holiday weekdays per year.

NVTC drew from funding applications for the number of trips and traced the transit routing as closely as possible in Google Maps to obtain the end-to-end distance.

Finally, the annual VMT reduction was obtained by subtracting the total annual “project” VMT (including drive-alone, bus and/or vanpool elements) from the annual “baseline” (drive-alone) VMT.

Figure 3 shows a sample VMT reduction computation for a Commuter Choice bus service project.

Hours of Delay Saved

NVTC estimated delay savings by first computing the travel time savings (if any) for each trip by subtracting the end-to-end “project” trip travel time from the end-to-end “baseline” trip travel time, both in minutes. For driving segments, the travel time was assumed to be the midpoint of the full range of potential non-toll travel times identified by Google Maps, reflecting the variability of day-to-day travel. For trips with multiple segments by transit, the overall travel time included waiting time between the segments.

To convert from minutes per trip to hours per year, NVTC multiplied the per-trip time difference by the number of annual project trips, then converted from minutes to hours by dividing by 60.

Regional Economic Benefits from Reduced Travel Delay

NVTC performed a similar computation to that for hours of delay saved, but just involving the in-vehicle portions of the “baseline” and “project” trips – in other words, when the commuter was aboard a moving vehicle, as opposed to waiting for a bus or train (or walking or bicycling).

The resulting total annual difference in in-vehicle travel times was multiplied by the figure in Table 10 below corresponding to the year for which the person-throughput data was reported to account for the assumed average value of a Northern Virginia commuter’s hour of travel time saved. The figures represent the United States Department of Transportation’s (USDOT) time savings valuation for business travel. While USDOT suggests use of a lower personal travel value for commute trips, the business travel value aligns more closely with how Northern Virginia commuters are likely to value their time based on predominant income levels.⁸

⁸ Specifically, the levels assumed in the Metropolitan Washington Council of Governments’ regional travel demand forecasting. See the [User’s Guide for the COG/TPB Gen2/Version 2.4 Travel Demand Forecasting Model](#), p. 181. The hourly rate of \$27.70 (in 2007 dollars), corresponding to households earning between \$50,000 and \$100,000, was assumed to be most applicable.



Table 10: Travel Time Valuations by Year

Year(s)	Value of One Hour of Travel Time	Source
2017-2023	\$29.40	USDOT Revised Departmental Guidance on Valuation of Travel Time in Economic Analysis (September 27, 2016)
2024	\$32.30	USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs (December 2023)

The steps to estimate the VMT reduction associated with OmniRide’s Staffordboro to Downtown D.C. express bus service, a Commuter Choice-funded route, for FY 2022 were as follows. For this project, the hypothetical ‘home’ location was a residential area two miles from the Staffordboro Commuter Lot, where the route picks up passengers in the morning. The work location was assumed to be directly along the route at L’Enfant Plaza in downtown D.C.

1. Baseline automobile VMT: Google Maps’ sole non-toll routing option from home to work is 40.8 miles, using the general-purpose lanes on I-395/95. There were estimated to be 70,731 trips on the OmniRide route during FY 2022, based on 271 reported daily trips in spring 2022 multiplied by 261. (All baseline trips are assumed to be drive-alone, so there is no adjustment to the number of trips for vehicle occupancy.) Baseline automobile VMT is therefore 2,885,825, the result of multiplying 40.8 by 70,731.

2. Project automobile VMT: As noted above, the home location is two (2.0) miles from the Staffordboro lot according to Google Maps. All project trips are assumed to access the lot by driving alone. Project automobile VMT is therefore 141,462, the result of multiplying 2.0 by 70,731.

3. Project bus VMT: Tracing the OmniRide route in Google Maps provides an approximate end-to-end length of 41.5 miles. OmniRide operated five morning one-way trips on the route in FY 2022, all supported by Commuter Choice, so the route’s VMT on a weekday morning is 207.5 (41.5 multiplied by 5). NVTC doubled the morning figure to reach the estimated daily bus VMT of 415. Converting the daily figure to annual by multiplying by 261 yields an annual project bus VMT of 108,315 (415 multiplied by 261).

4. Annual VMT reduction: The baseline VMT is 2,885,825 and the total project VMT is 249,777, comprising the project automobile VMT of 141,462 and the project bus VMT of 108,315. The annual VMT reduction for FY 2022, from subtracting the project VMT from the baseline VMT, is 2,636,048.

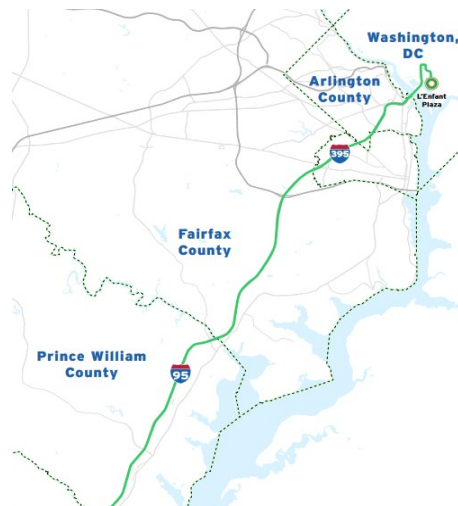


Figure 3: Sample Vehicle Miles Traveled Reduction Computation



Automobile Crashes Avoided

NVTC computed the difference in annual automobile VMT between the “baseline” and “project” scenarios and multiplied it by the incidence of Northern Virginia automobile crashes in the year for which the person-throughput data was reported according to Virginia Department of Transportation (VDOT) data, as shown in Table 11. VDOT has aggregated and published crash data through 2022, so the 2022 rate is assumed for subsequent years.⁹

Table 11: Northern Virginia Crash Rates per 1,000,000 VMT

Year(s)	Crash Rate
2017	1.53
2018	1.53
2019	1.49
2020	1.32
2021	1.41
2022-2024	1.39

Greenhouse Gas Emissions Reductions

NVTC used the nationally recognized [California Life-Cycle Benefit/Cost Analysis Model \(Cal-B/C\)](#)¹⁰ Excel-based tool to convert the annual VMT changes into estimated greenhouse gas emissions reductions. Cal-B/C identifies the quantity of tailpipe emissions in grams per mile for the greenhouse gases carbon dioxide (CO₂) and nitrogen oxides (NO_x).¹¹ The emission rates are specific to vehicle type (car or bus) and average travel speed.

To estimate annual “baseline” and “project” greenhouse gas emissions in metric tons:

1. NVTC computed the average travel speed for automobile travel in the “baseline” trip in miles per hour, using the end-to-end travel distance and travel time.
2. NVTC obtained CO₂-equivalent emissions for the “baseline” trip by adding together the following:
 - a. The baseline annual automobile VMT multiplied by Cal-B/C’s grams/mile CO₂ emissions factor for the average travel speed, converted from grams to metric tons of emissions by dividing by 1,000,000, and
 - b. The baseline annual automobile VMT multiplied by Cal-B/C’s grams/mile NO_x emissions factor for the average travel speed, converted from grams to metric tons of emissions by dividing by 1,000,000, then multiplied by 298 to convert the NO_x emissions to CO₂-equivalent.¹²

⁹ [Virginia Department of Transportation Crash Summary Book \(2015-2022\)](#).

¹⁰ Developed by the California Department of Transportation using on-road emissions estimates from the California Air Resources Board’s 2021 EMFAC model and compliant with USDOT guidance on benefit-cost analyses.

¹¹ Cal-B/C includes projections for various vehicle model years. NVTC used model-year 2024 projections.

¹² [EPA Greenhouse Gas Equivalencies Calculator](#).



3. NVTC then performed steps 1 and 2 for the “project” trip:
 - a. For automobile travel, the computation incorporated the project annual automobile VMT and average automobile travel speed in miles per hour.
 - b. For operation of bus transit funded by Commuter Choice, the computation incorporated the total annual revenue bus VMT and the average end-to-end bus travel speed in miles per hour per revenue trip (from the trip distance traced in Google Maps and the one-way travel time provided in online timetables).

The difference in CO₂-equivalent emissions between the “baseline” and “project” travel was then computed. As the absolute impact of a number of metric tons reduced does not have a widely recognized basis for comparison, NVTC aggregated the results across all projects and fiscal years to obtain a percentage reduction in emissions.

Fuel Expenditure Savings

NVTC first estimated the number of gallons of fuel that commuters saved annually on their automobile travel under the “project” trip relative to the “baseline” trip using Cal-B/C’s factors for fuel consumption based on average travel speed.¹³ For each scenario, NVTC estimated commuters’ annual fuel consumption in gallons by multiplying the applicable Cal-B/C fuel consumption factor (provided in gallons per mile) for the automobile portion of the trip by the annual automobile VMT. NVTC then obtained the fuel consumption reduction by subtracting the “project” fuel consumption from the “baseline” fuel consumption. NVTC multiplied this difference by the approximate fuel price¹⁴, reflected in Table 12, to obtain an estimated total fuel expenditure savings for each project in each year. For fiscal years through FY 2022, NVTC multiplied the difference by \$4, equivalent to approximate early 2022 per-gallon prices (when this analysis was begun).

Table 12: Per-Gallon Fuel Costs

Year(s)	Per-Gallon Fuel Cost
2017-2022	\$4.00
2023	\$3.50
2024	\$3.60

5. Conclusion

This technical memorandum documents NVTC’s methodology to monitor, report and evaluate person throughput performance and related regional benefits for Commuter Choice projects to support the figures included in the Project Performance portion of the [2024 Commuter Choice Annual Report](#). NVTC presented the person-throughput performance for projects active in spring 2024, reflecting a single, straightforward measure that aligns with the corridor improvement goals that any Commuter Choice project must support – specifically, maximizing person throughput,

¹³ Cal-B/C includes projections for various vehicle model years. NVTC used model-year 2024 projections, the closest available to today.

¹⁴ [American Automobile Association reported gas prices](#) for the “Washington, DC, (VA Only)” metropolitan area, “Regular” grade fuel.



improving mobility, supporting new and diverse travel choices, and enhancing transportation safety and travel reliability. NVTC also estimated the benefits since 2017 of Commuter Choice funding to Northern Virginia’s economy and quality of life.

NVTC found that the 24 projects reporting performance data for spring 2024 provided 7,573 passenger trips each weekday through the I-66 Inside the Beltway and I-395/95 corridors. Further, NVTC estimated the following benefits to date of Commuter Choice funding using nationally recognized tools and factors applied to the usage of each project and how commuters shifting to the project would be likely to adjust their travel:

- 1,322,253 hours of total travel time savings for commuters, amounting to \$46,402,516 in regional economic benefits from reduced travel delay
- 136,776,841 fewer vehicle miles traveled
- \$18,533,091 in fuel expenditures saved
- 205 automobile crashes avoided
- A 71% reduction in greenhouse gas emissions
- 7,091,805 total project trips



Appendix A: Projects Included in the Regional Benefits Estimation

Project	Grantee	Corridor	Fiscal Years (20-)							
			17	18	19	20	21	22	23	24
Metrobus Route 2A Peak Period Expansion	Arlington County	I-66		X	X					
Enhanced Bus Service on Metrobus 3Y: Lee Highway-Farragut Square	Arlington County	I-66				X				
Route 55 Peak Period Service Expansion	Arlington County	I-66		X	X					
Expanded TDM Outreach on the I-66 Corridor	Arlington County	I-66						X		X
Bus Stop Consolidation	Arlington County	I-66								X
CUE Access and Technology Improvements	City of Fairfax	I-66								X
Bike Share Implementation	City of Fairfax	I-66								X
Expanded Transit Access, Bike Share	City of Falls Church	I-66				X	X	X		
Metrobus Route 3T Extension and Service Expansion	City of Falls Church	I-66			X	X				
Bicycle Parking Improvements at Manassas VRE Station	City of Manassas	I-66				X				
Fairfax Connector Route 699: Monument Drive Park-and-Ride to Downtown Washington, D.C.	Fairfax County	I-66		X	X	X	X	X		
Fairfax Connector Route 698: Stringfellow Road Park-and-Ride to the Pentagon	Fairfax County	I-66			X	X	X	X	X	X
Fairfax Connector Route 697: Stringfellow Road Park-and-Ride to L'Enfant Plaza	Fairfax County	I-66					X	X		
I-66 Corridor Vienna/Merrifield Bike Share Expansion	Fairfax County	I-66							X	X
TDM Strategy – Fare Buy-Down on Bus Service from Reston North to Crystal City	Fairfax County	I-66							X	
Loudoun County Transit Route 281/681 Service Enhancement: Stone Ridge Park-and-Ride to Downtown Washington, D.C.	Loudoun County	I-66	X	X	X	X		X	X	X
Loudoun County Transit Metro Connection Route 88X Extension to Dulles South	Loudoun County	I-66			X	X				
Loudoun County TDM	Loudoun County	I-66		X	X					
Loudoun County Transit Metro Connection from New Purcellville Park and Ride	Loudoun County	I-66			X	X	X	X	X	X
New Bus Service from Stone Ridge to Pentagon	Loudoun County	I-66						X	X	X



Project	Grantee	Corridor	Fiscal Years (20-)							
			17	18	19	20	21	22	23	24
Loudoun County Transit Route 483/883: Harmony Park-and-Ride to Downtown Washington, D.C.	Loudoun County	I-66						X	X	X
OmniRide Route 612: Gainesville to the Pentagon	OmniRide	I-66	X	X	X	X	X	X	X	X
Enhanced Bus Service from Gainesville to DC	OmniRide	I-66				X	X	X		
OmniRide Linton Hall Metro Direct Bus Service Enhancement	OmniRide	I-66				X	X			
OmniRide Route 622: Haymarket to Rosslyn	OmniRide	I-66				X	X	X	X	X
TDM Strategy - Fare Buy-Down on I-66 Commuter Bus Service	Prince William County	I-66							X	X
Enhanced Bus Service on AT-1 Plus: West End to Van Dorn Metro	DASH	I-395				X	X			
DASH Line 35 Service Enhancement: Van Dorn Street Station to the Pentagon	DASH	I-395						X	X	X
Enhanced Bus Service on AT-9: Mark Center to Potomac Yard	DASH	I-395				X	X			
DASH Line 36A/B Service Enhancement: Mark Center to Potomac Yard-VT Station	DASH	I-395						X	X	X
Fairfax Connector Route 396: Backlick North Park and Ride to the Pentagon	Fairfax County	I-395				X	X	X	X	X
Fairfax Connector Route 371 Service Enhancement: Lorton to Franconia-Springfield Station	Fairfax County	I-395								X
OmniRide Route 972 Service Enhancement: Dale City to Ballston	OmniRide	I-395				X	X	X	X	X
OmniRide Route 95 (Prince William Metro Express) Service Enhancement: Dale City to Franconia-Springfield Station	OmniRide	I-395				X	X	X	X	X
OmniRide Route 52 (Route 1 Local) Service Enhancement: Quantico to Woodbridge Station	OmniRide	I-395				X	X	X	X	X
OmniRide Route 943: Staffordboro to Downtown Washington, D.C.	OmniRide	I-395				X	X	X	X	X
OmniRide Route 942: Staffordboro to the Pentagon	OmniRide	I-395				X	X	X	X	X
I-395/95 Corridor Vanpool Monthly Incentive	OmniRide	I-395						X	X	X
New Park and Ride Lot in Massaponax	Spotsylvania County	I-395								X



Appendix B: I-66 and I-395 Cordon Count Data Analysis

As an addition to the project performance information presented in the [2024 Commuter Choice Annual Report](#), NVTC hereby also presents an update to the broader travel trends over time in the I-66 Inside the Beltway (ITB) and I-395 corridors as most recently highlighted in the 2022 Commuter Choice Annual Report's [technical memorandum](#). These analyses of travel trends are based on travel volume counts taken during the morning rush hour in each corridor, inclusive of expressways and parallel arterials and rail lines, across all modes of travel to help depict how tolling and Commuter Choice funded projects are influencing commuters' transportation choices and the overall numbers of people and vehicles moving through each corridor.

Travel volume counts have now been taken in the I-66 ITB corridor in 2015 and in both the I-66 ITB and I-395 corridors in 2019, 2021 and 2023. When they were being planned, the 2021 counts, which took place in November, were anticipated to capture large regional employers' implementation of return-to-office plans following the COVID-19 pandemic. Many of these plans instead began to be implemented in 2022, so the fall 2023 counts (which took place in October and November) provide the clearest picture of post-pandemic travel patterns to date. However, a large-scale return of civilian federal employees to frequent in-person work, particularly to District of Columbia worksites, has not taken place.

Data for the I-66 ITB¹⁵ corridor showed substantial gains in more efficient travel between 2021 and 2023, with corridor users returning to transit in meaningful numbers, though still with substantially lower ridership than in 2019. The I-66 corridor saw growth in both highway and transit person throughput from 2021 to 2023, reflecting a continued and ongoing post-pandemic recovery. Between 2021 and 2023, transit person throughput on I-66 and parallel routes eastbound during the morning peak-period tripled, while highway person throughput increased by 40%. Overall, peak-period, peak-direction person throughput along the I-66 corridor increased by 64% compared to 2021.

Looking at mode share on the I-66 corridor, 26% of the morning peak-period eastbound trips were taken via transit (local bus, commuter bus, or commuter rail), a substantial increase over the transit mode share in 2021 (15%). Of those transit trips taken in 2023, approximately 78% were rail trips on WMATA's Orange and Silver lines and the outer portion of VRE's Manassas line, 9% were local bus trips on Metrobus and ART, and 13% were commuter bus trips on Loudoun County Transit, Fairfax Connector and OmniRide.

As travel on the I-395 corridor recovered relatively quickly post-pandemic, highway person throughput was effectively unchanged compared to 2021, though transit person throughput saw large gains. During the morning rush, transit person throughput along the I-395 corridor doubled compared to 2021 and thus supported all of the corridor's 14% growth in peak-period, peak-direction person throughput compared to 2021.

¹⁵ The I-66 ITB corridor includes I-66, Lee Highway (U.S. 29), Washington Blvd. (Va. 237), Wilson Blvd. and Arlington Blvd. (U.S. 50) for the purposes of this analysis. Counts of the numbers of inbound vehicles and people, including buses and their passengers, were taken along each of these thoroughfares at Glebe Road (see Figure 4). Inbound ridership counts were also obtained for the Metrorail Orange and Silver Lines between the East Falls Church and Ballston stations and the VRE Manassas Line at the line's outer stations proximate to I-66. Appendix B-1 describes the count methodology in more detail.



Looking at mode share on the I-395 corridor, 26% of the morning peak-period northbound trips in the I-395 corridor were taken via transit (local bus, commuter bus, or commuter rail), compared to 15% in 2021. Of those transit trips taken in 2023, approximately 62% were rail trips on WMATA’s Blue and Yellow lines, VRE’s Fredericksburg Line and the inner portion of VRE’s Manassas Line, while 27% were local bus trips on Metrobus, ART, and DASH, and 11% were commuter bus trips on OmniRide and Fairfax Connector.

Changes in I-66 Inside the Beltway Corridor Travel, 2015 to 2023

Figure 4 shows the main roadways in the I-66 ITB corridor. Overall, about 40,000 people and 25,000 vehicles traveled inbound per day through the I-66 ITB corridor during the corridor’s three-hour weekday morning peak-period (7:00 to 10:00 a.m.) as of late 2023. Between 2015 and 2019, the number of people moving through the corridor had grown by about 700 people (1.2%) while the number of vehicles decreased by about 750 (2.7%). From 2019 to 2021, the number of people moving through the corridor decreased by about 35,000 (59%) and the number of vehicles by about 9,500 (35%), reflecting continued impacts of the pandemic and continued high levels of remote work. As the pandemic waned, travel volumes rebounded between 2021 and 2023, with a large increase in the number of people and vehicles moving through the corridor. From 2021 to 2023, the number of people moving through the corridor increased by over 15,000 (45%) and the number of vehicles increased by approximately 7,000 (40%). While the number of vehicles moving through the corridor is approaching pre-pandemic levels, person-throughput remains reduced.

Figure 5 depicts the changes in volume over time.

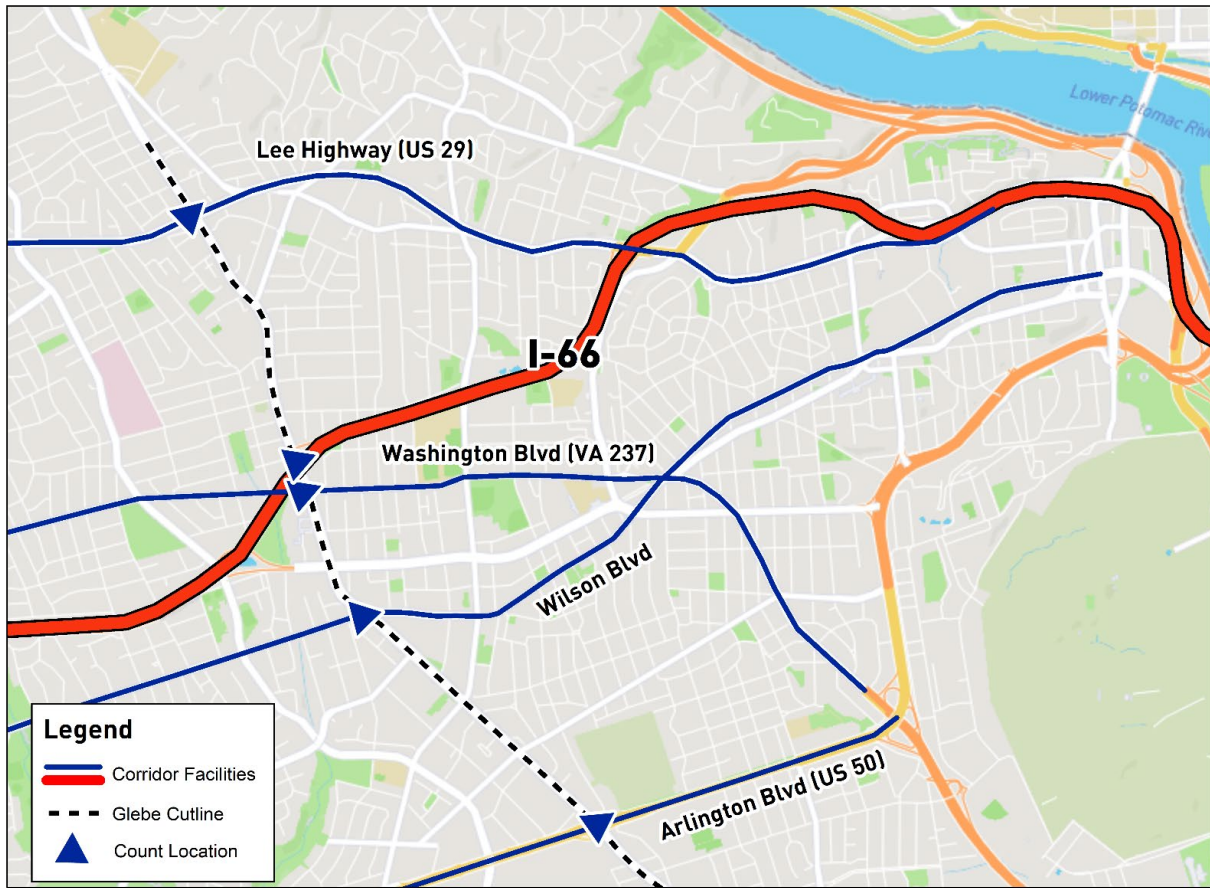


Figure 4: I-66 Corridor Traffic Count Locations

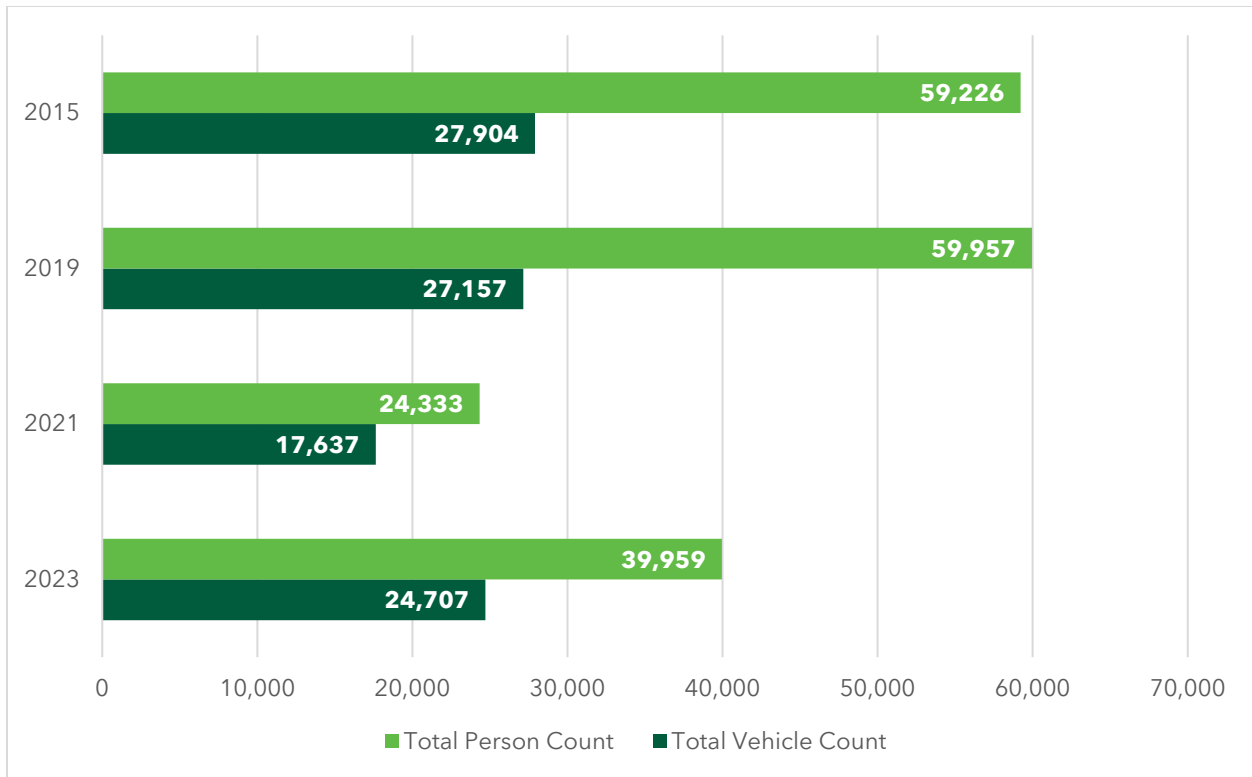


Figure 5: Change in I-66 ITB Corridor Travel Volumes, 2015 to 2023

Source: Metropolitan Washington Council of Governments Transportation Policy Board, April 2015, April 2019, November 2021 and November 2023 traffic counts

A majority of the trips in the corridor in 2023 were made by non-HOV auto, as shown in Figure 6. HOV and transit trips accounted for 31% of the corridor’s inbound trips during the morning peak hour in 2023, while non-HOV trips made up 69% of trips. The share of transit trips in the corridor increased by over 11% compared to 2021. The HOV and transit mode shares and their shifts are discussed more below.

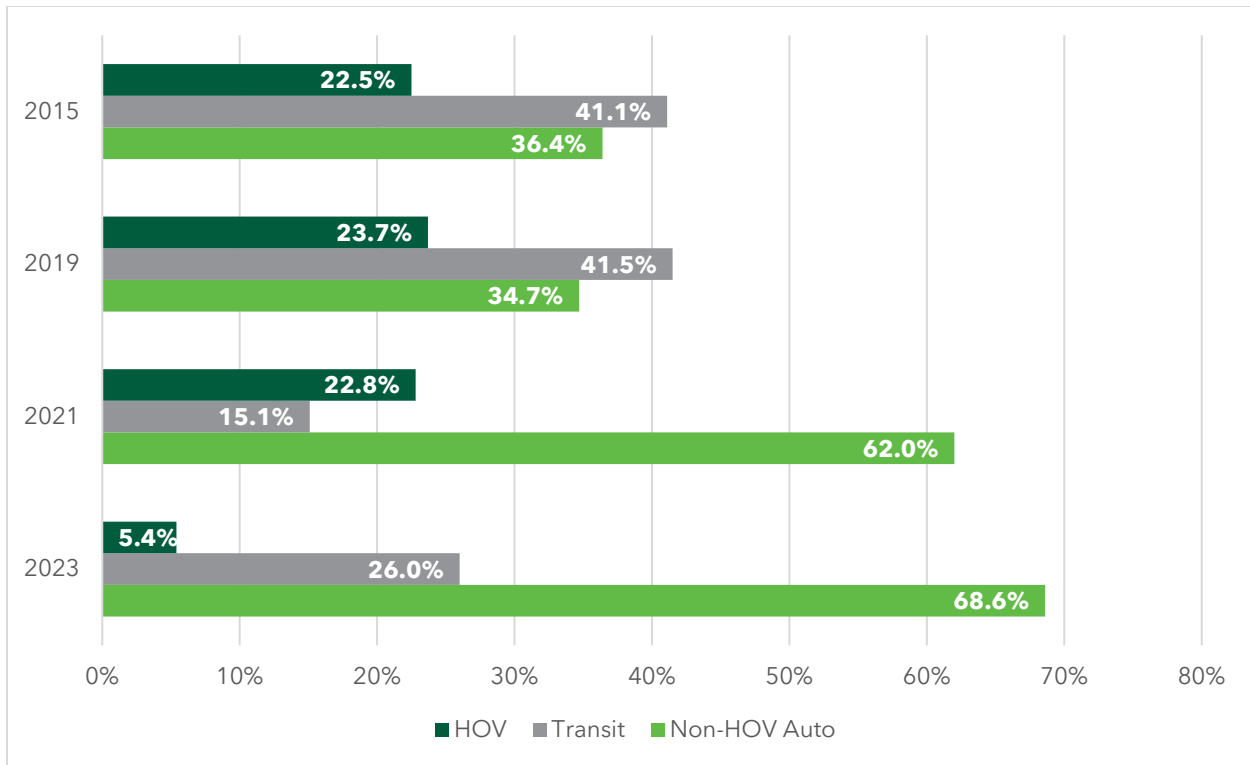


Figure 6: I-66 ITB Corridor Mode Share, 2015 to 2023

Source: Metropolitan Washington Council of Governments Transportation Policy Board, April 2015, April 2019, November 2021 and November 2023 traffic counts

HOV Mode Share

Approximately 5% of the I-66 ITB corridor’s inbound weekday morning peak-period trips were made by HOV in 2023, a much lower level than in prior years. A portion of the decrease is likely due to the change in the definition of an HOV on I-66 that took effect in December 2022, upon the opening of the I-66 Outside the Beltway Express Lanes, from an automobile with two or more occupants to one with three or more occupants. Vehicles with two occupants are therefore now counted as non-HOVs, where they were previously counted as an HOV. Challenges with the manual counts of vehicle occupancy, for instance due to glare or angle, may also have contributed to an underreporting of HOV travel.

Transit Mode Share

Nearly 11,000 inbound trips were made by transit in the I-66 ITB corridor during the weekday morning peak period as of late 2023. Transit’s mode share among weekday morning peak period trips was 26%, a substantial increase compared with 2021 (15%) though still well below 2019 levels (42%), when transit provided approximately 25,000 weekday morning peak-period inbound trips. Rail is still the predominant transit mode in the corridor, making up about 78% of transit trips. Figure 7 shows the change in the distribution of transit ridership between 2015 and 2023.

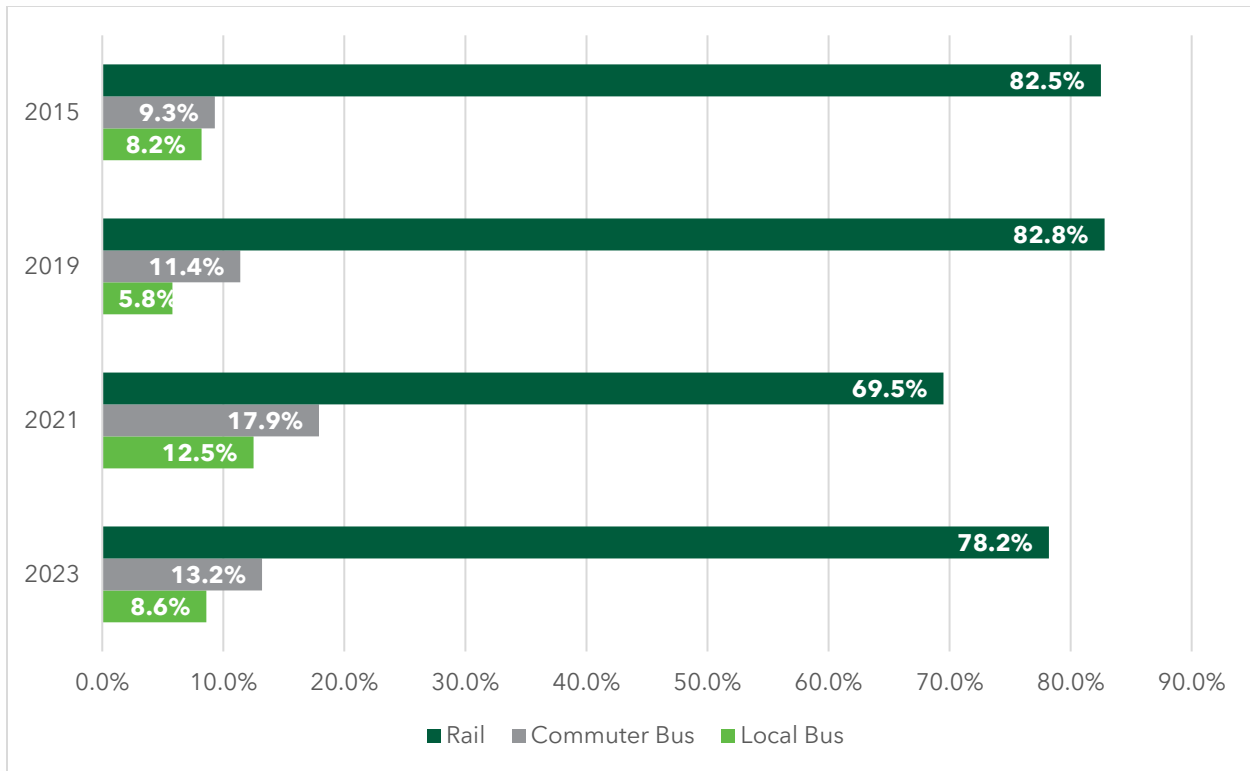


Figure 7: Distribution of I-66 ITB Corridor Transit Trips by Transit Mode

Source: Metropolitan Washington Council of Governments Transportation Policy Board April 2015, April 2019, November 2021 and November 2023 traffic counts

I-66 Commuter Choice

I-66 Commuter Choice has funded numerous transit improvements and other alternatives to driving alone. Table 13 identifies the 17 projects that were underway – that is, operational transit services, capital projects that were partially or fully implemented, and outreach campaigns that had begun – as of November 2023, when the most recent set of I-66 ITB corridor counts occurred.

Table 13: Commuter Choice Projects Underway in the I-66 Corridor, November 2023

Projects	Status as of November 2023	Type of Project	Recipient
Expanded TDM Outreach to the I-66 Corridor	Peak-period ART free-fare campaign underway	Transportation Demand Management	Arlington County
Bus Stop Consolidation	Bus stop improvements fully implemented as of spring 2020	Bus Capital	Arlington County
CUE Access and Technology Improvements	Most bus stop improvements complete	Bus Capital	City of Fairfax
Bike Share Implementation	Three of four stations in service	Access to Transit	City of Fairfax

Projects	Status as of November 2023	Type of Project	Recipient
Fairfax Connector Route 699: Monument Drive Park-and-Ride to Downtown Washington, D.C.	Service began December 2017	Bus Service	Fairfax County
Fairfax Connector Route 698: Stringfellow Road Park-and-Ride to the Pentagon	Service began January 2019	Bus Service	Fairfax County
Fairfax Connector Route 697: Stringfellow Road Park-and-Ride to L'Enfant Plaza	Service began August 2020	Bus Service	Fairfax County
I-66 Corridor Vienna/Merrifield Bike Share Expansion	Five of 10 stations in service	Access to Transit	Fairfax County
Loudoun County Transit Route 281/681 Service Enhancement: Stone Ridge Park-and-Ride to Downtown Washington, D.C.	Service resumed May 2022	Bus Service	Loudoun County
Loudoun County Transit Metro Connection from New Purcellville Park and Ride	Service began November 2018	Bus Service	Loudoun County
New Bus Service from Stone Ridge to Pentagon	Service began August 2021	Bus Service	Loudoun County
Loudoun County Transit Route 483/883: Harmony Park-and-Ride to Downtown Washington, D.C.	Service began August 2021	Bus Service	Loudoun County
Bicycle Parking Improvements at Manassas VRE Station	Fully implemented as of October 2020	Access to Transit	City of Manassas
OmniRide Route 612: Gainesville to the Pentagon	Service began December 2016	Bus Service	OmniRide
OmniRide Route 622: Haymarket to Rosslyn	Service began July 2019	Bus Service	OmniRide
New TDM Outreach to the I-66 Corridor	Information and marketing campaign underway	Transportation Demand Management	Prince William County
TDM Strategy - Fare Buy-Down on I-66 Commuter Bus Service	Half-fares in place	Transportation Demand Management	Prince William County

Changes in I-395 Corridor Travel, 2019 to 2023

Figure 8 shows the main roadways in the I-395/95 corridor. Approximately 56,000 people and 36,000 vehicles moved inbound through the corridor¹⁶ each weekday during the corridor’s three-hour weekday morning peak-period as of late 2023. Total person throughput increased by approximately 7,000 (14%) between 2021 and 2023, while the total vehicle count increased by about 200 vehicles, indicating that nearly all net new morning peak direction trips were taken via transit. Even with this increase, person-throughput remains well below 2019 levels, as does the number of vehicles to a lesser extent. Figure 9 shows the change in total person throughput and vehicle counts over time.

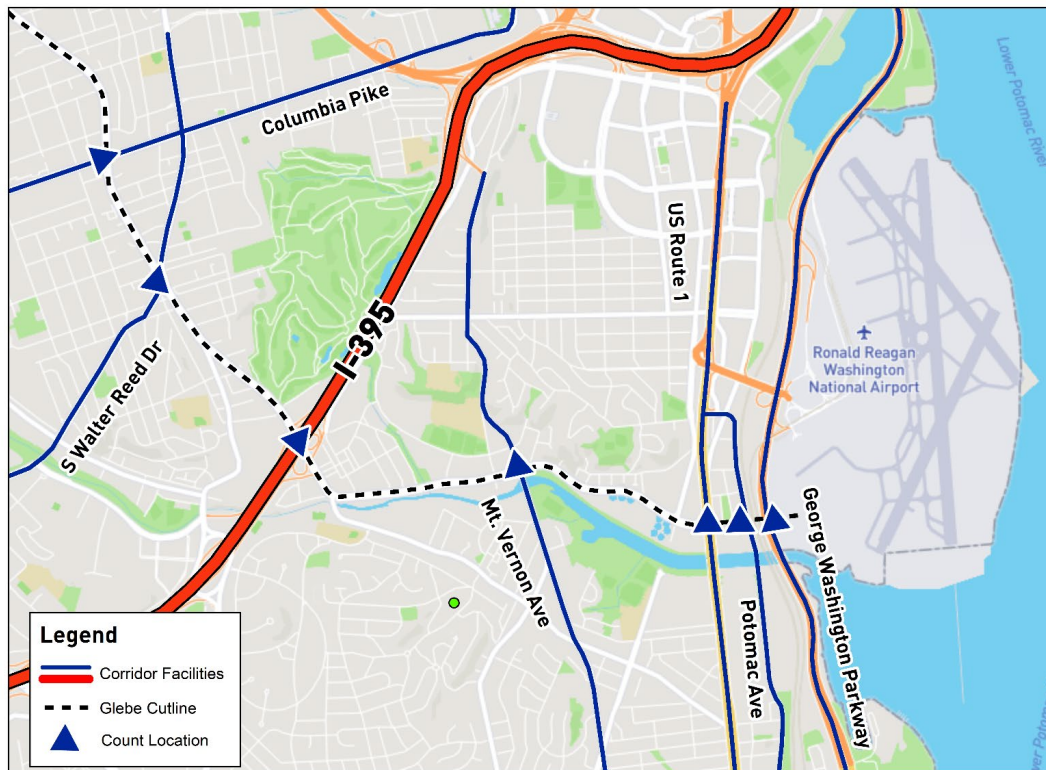


Figure 8: I-395/95 Corridor Traffic Count Locations

¹⁶ The I-395 corridor includes I-395, Columbia Pike, S. Walter Reed Drive, Mt. Vernon Ave, U.S. 1, Potomac Avenue, and George Washington Parkway for the purposes of this analysis. Counts of the numbers of inbound vehicles and people, including buses and their passengers, were taken along each of these thoroughfares at Glebe Road (see Figure 9). Inbound ridership counts were also obtained for the Metrorail Blue and Yellow Lines between the Braddock Road and Ronald Reagan Washington National Airport stations, as well as the VRE Fredericksburg Line between the Alexandria and Crystal City stations. Appendix B-1 describes the count methodology in more detail.

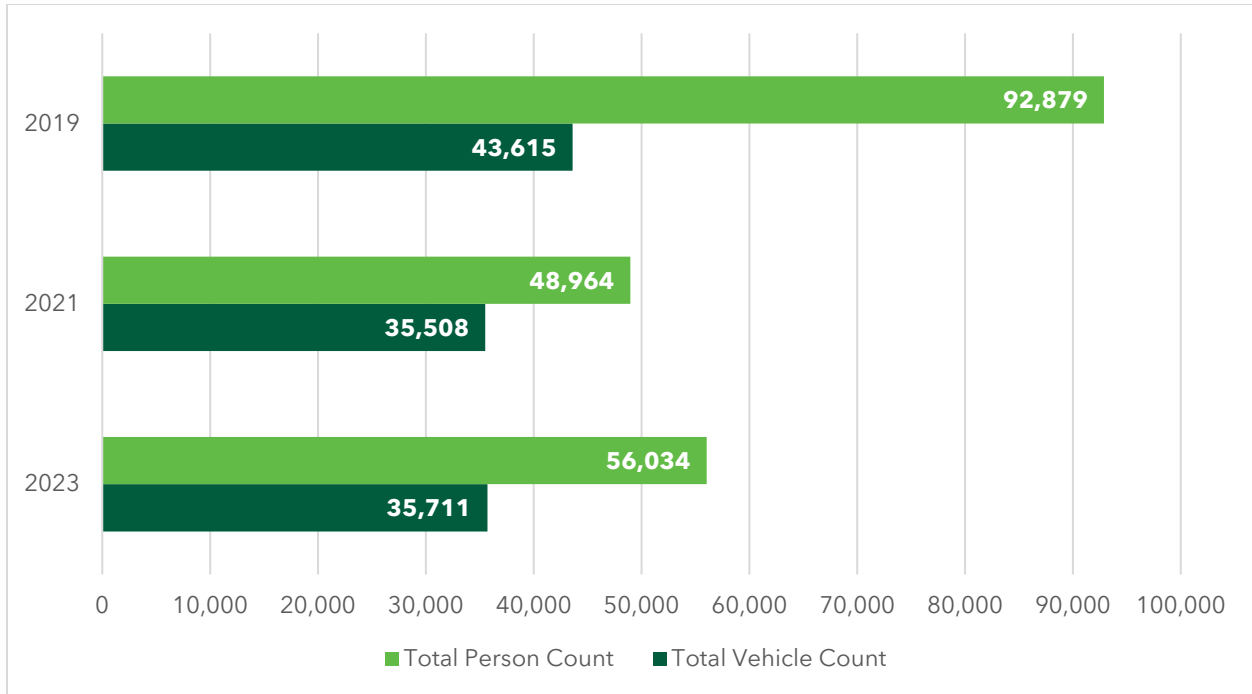


Figure 9: Change in I-395/95 Corridor Travel Volumes, 2019 to 2023

Source: Metropolitan Washington Council of Governments Transportation Policy Board, April 2019, November 2021 and November 2023 traffic counts

Transit and HOV, the latter defined for the I-395 corridor as automobiles occupied by three or more people, together accounted for over 29% of the corridor’s inbound morning peak period trips in late 2023. In 2021, transit and HOV trips accounted for over 20% of trips, while in 2019, they accounted for 58% of trips, as shown in Figure 10.

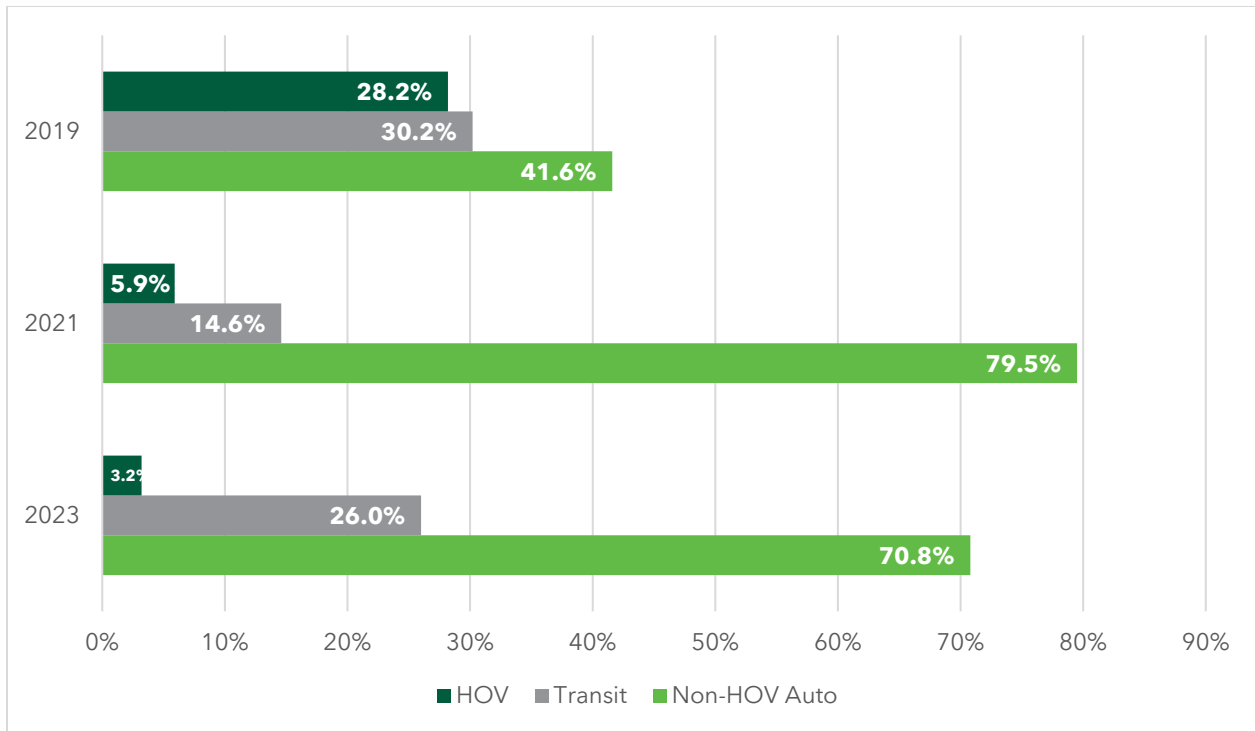


Figure 10: I-395/95 Corridor Mode Share, 2019 to 2023

Source: Metropolitan Washington Council of Governments Transportation Policy Board, April 2019, November 2021 and November 2023 traffic counts

HOV Mode Share

Approximately 3% of the I-395 corridor’s inbound morning peak period trips were made by HOV in fall 2023, defined for this corridor as an automobile with three or more occupants. The corridor’s high HOV share of trips in 2019 reflected the preponderance of casual carpooling or “slugging,” which allowed travelers willing to share a vehicle with other commuters to save significant time on their commutes via the then-I-395 HOV lanes. The practice largely ceased during the pandemic though anecdotally has again become more prevalent, if with fewer travelers. The lack since spring 2019 (after which noisewalls were installed) of a manual counting location along I-395 north of Glebe Road that offers good visibility into vehicles is suspected to have contributed to an underreporting of HOV travel; the 2023 counts suggested about half as many HOVs along I-395 as in 2021.

Transit Mode Share

About 14,600 inbound trips were made by transit in the I-395 corridor during the morning peak period as of late 2023. Transit accounted for about 26% of all inbound morning peak period trips in the corridor. Rail accounted for 62% of transit trips, with the remaining 38% taken by bus. Compared to 2021, rail’s share of transit trips increased by nearly 11%, and bus’s share decreased by the same margin. Both bus and rail modes gained ridership between 2021 and 2023, though the growth of rail ridership significantly outpaced that of bus ridership. While the over 14,000 transit trips in the corridor were double those in 2021, they were roughly half those in 2019, when transit supported

about 29,000 total inbound passenger trips each morning.¹⁷ The comparison between 2019, 2021 and 2023 peak period transit mode share is shown in Figure 11.

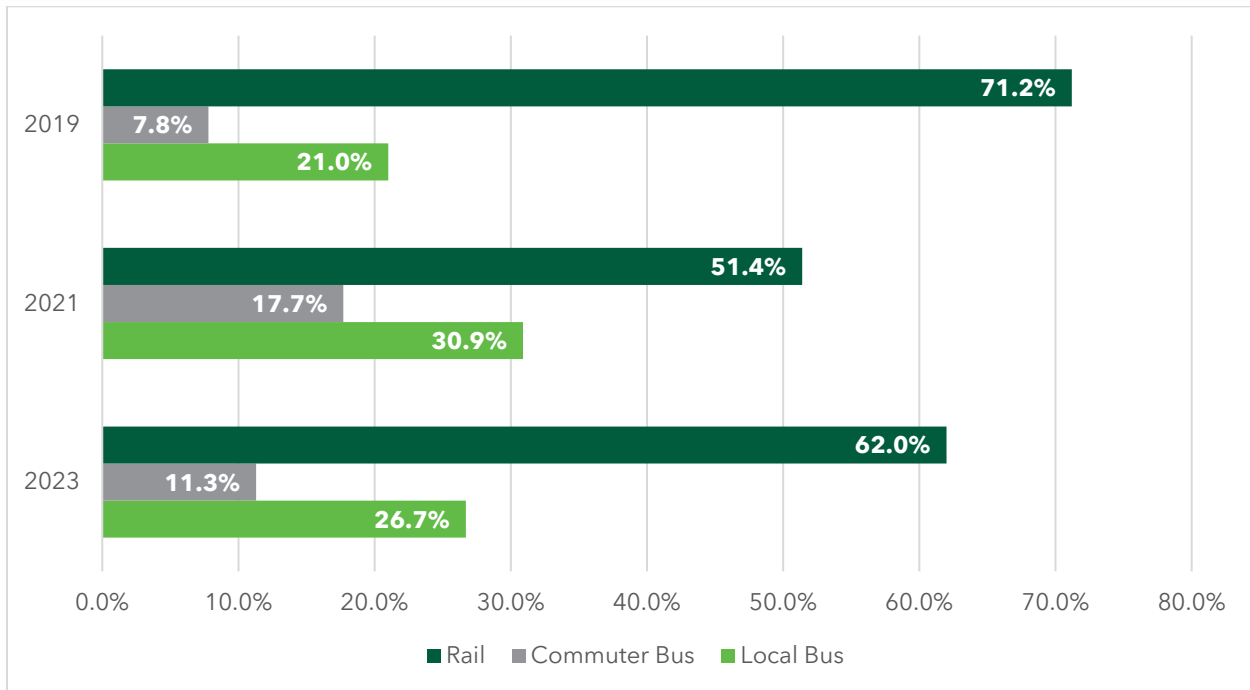


Figure 11: Distribution of I-395/95 Corridor Transit Trips by Transit Mode, 2019 to 2023

Source: Metropolitan Washington Council of Governments Transportation Policy Board, April 2019, November 2021 and November 2023 traffic counts

I-395/95 Commuter Choice

Table 14 identifies the 10 I-395/95 Commuter Choice-funded transit service improvements and other efforts were underway – that is, operational transit services, capital projects that were partially or fully implemented, and outreach campaigns that had begun – as of November 2023, when the most recent set of I-395/95 corridor counts occurred.

Table 14: Commuter Choice Projects Underway in the I-395/95 Corridor, November 2023

Projects	Status as of November 2023	Type of Project	Recipient
DASH Line 35 Service Enhancement: Van Dorn Street Station to the Pentagon	Enhanced service began September 2021	Bus Service	DASH
DASH Line 36A/B Service Enhancement: Mark Center to Potomac Yard-VT Station	Enhanced service began September 2021	Bus Service	DASH

¹⁷ Ridership on Arlington Transit (ART) and DASH local buses was underreported in 2019 due to a manual counting error.



Projects	Status as of November 2023	Type of Project	Recipient
Fairfax Connector Route 396: Backlick North Park and Ride to the Pentagon	Service began January 2020	Bus Service	Fairfax County
New TDM Outreach Campaign for Military Facilities	Campaign began October 2019	Transportation Demand Management	NVRC
OmniRide Route 972 Service Enhancement: Dale City to Ballston	Enhanced service began November 2019	Bus Service	OmniRide
OmniRide Route 95 (Prince William Metro Express) Service Enhancement: Dale City to Franconia-Springfield Station	Enhanced service began November 2019	Bus Service	OmniRide
OmniRide Route 52 (Route 1 Local) Service Enhancement: Quantico to Woodbridge Station	Enhanced service began November 2019	Bus Service	OmniRide
OmniRide Route 943: Staffordboro to Downtown Washington, D.C.	Service began November 2019	Bus Service	OmniRide
OmniRide Route 942: Staffordboro to the Pentagon	Service began November 2019	Bus Service	OmniRide
New Park and Ride Lot in Massaponax	Lot opened for use in June 2023	Park-and-Ride	Spotsylvania County

Conclusions and Discussion

Travel volumes in both the I-66 ITB and I-395 corridors had recovered a significant portion of their pandemic decreases by fall 2023, though with a favoring in each case of non-HOV automobile travel. On the I-66 corridor, vehicle- and person-throughput volumes represented 90% and 66% of spring 2019 levels, respectively; transit ridership roughly tripled, though from a very low baseline, between fall 2021 and fall 2023. On the I-395 corridor, vehicle- and person-throughput volumes represented 80% and 60% of spring 2019 levels, respectively; all of the corridor’s person-throughput growth between fall 2021 and fall 2023, about 7,000 travelers each morning, was met through increased transit ridership. The overall recovery between fall 2021 and fall 2023 was more pronounced in the I-66 corridor, along which travel volumes had decreased more steeply during the pandemic (to 41% of 2019 person throughput in 2021 compared to 53% for the I-395 corridor).

The 2023 counts mirror the partial rebound in transit ridership throughout the region, though the extent of the rebound has varied by day, time and mode of travel, as well as specific trip origins and destinations. Peak-period rail ridership in the two corridors remains below pre-pandemic levels; on the other hand, some Commuter Choice-funded bus service improvements in the two corridors have surpassed their 2019 ridership, as has WMATA’s systemwide weekend bus and rail ridership¹⁸. A

¹⁸ [Metro Ridership Snapshot, July 2024](#)



limitation of the counts and data supporting this analysis is their restriction to peak-period, peak-direction travel, when greater shares of trips in the corridors now likely occur at off-peak times. As such, the data presented in this analysis should not be treated as representative of transit’s overall utility to corridor travel.

Accurate manual counts of automobile occupancy have been challenging to obtain for the two corridors, particularly I-395. A decrease in HOV travel in the I-66 corridor between 2021 and 2023 could be largely explained by the implementation of a more stringent definition of an HOV (i.e., a vehicle with three or more occupants rather than two or more). The reason for a decrease in the number of HOVs counted along I-395 in 2023 compared to 2021 is unclear, beyond potentially poor visibility into vehicles, considering that the practice of “slugging” has anecdotally become prevalent again, if not to pre-pandemic levels.

Future Updates

Newer data platforms that aggregate location-based phone data may be able to provide a richer picture of corridor-level travel, including volumes, mode shares, origins and destinations, and routings by time of day. NVTC plans to evaluate such options for data provision and seeks to integrate a new set of findings about travel in the I-66 and I-395 corridors into the Commuter Choice Annual Report as soon as practicable.



B-1. Methodology

In spring 2015 and 2019 and fall 2021 and 2023, the Metropolitan Washington Council of Governments' Transportation Planning Board (TPB) technical staff conducted mode share studies on behalf of the Virginia Department of Transportation (VDOT). The study areas included the I-66 ITB corridor in 2015, 2019, 2021 and 2023 and the I-395 corridor in 2019, 2021 and 2023. These studies were performed as part of the TPB Virginia Technical Assistance Program in support of NVTC's Commuter Choice program.

The counts sought to quantify the number of vehicles and people crossing through the corridor. The counts included all modes of ground transportation, including motorized and non-motorized modes. The 2023 counts along the I-66 ITB corridor were an update to the 2021 Mode Share Study: I-66 Inside the Beltway. The traffic count locations, data processing approaches, technical methodologies, and assumptions of the current count closely aligns with the 2021 study. The 2023 I-395 counts were an update to the 2021 Mode Share Study: I-395 corridor. The traffic count locations, data processing approaches, technical methodologies, and assumptions of the current count closely aligns with the 2021, 2019 and (in the I-66 corridor) 2015 studies.

The counts were taken along a cutline, an artificial boundary that is defined to capture movements through a defined corridor at a specific point. Glebe Road (Va. 120) served as the cutline because it roughly bisects the corridors in the middle and provides a reasonable cordon line. The counts were taken manually from 5:00 a.m. until 10:00 a.m. over three consecutive weekdays in the middle of the week, in November during a normal workweek. The data compiled all vehicle and person movement crossing the cutlines, including passenger counts on local, express, and commuter bus routes (in some cases collected via automatic passenger counter devices on the buses). Metrorail and VRE ridership data were obtained from the providers for the same dates as the traffic counts.

The analyses in this report for each corridor focus on the three-hour portion of the count period with the highest travel volumes. This approach provides the clearest indication of the impacts of tolling and increased commute options on travel volumes and behavior.

Study Area

The I-66 ITB corridor is defined as a system of west-east highways leading from Northern Virginia suburbs into employment destinations in the core area of the Washington Metropolitan region. The I-66 ITB corridor consists of the following five highways from north to south, with counts taken at Glebe Road: Lee Highway (U.S. 29), Washington Boulevard (Va. 237), I-66, Wilson Boulevard, and Arlington Boulevard (U.S. 50).

The I-395 corridor is defined as a system of generally south-north or southwest-northeast highways leading into employment destinations in the core area of the Washington Metropolitan region. The following seven highways defined the I-395 corridor from west to east: Columbia Pike, S. Walter Reed Drive, I-395, Mt. Vernon Ave, U.S. 1, Potomac Avenue, and George Washington Parkway.