I-95 Corridor
Transit and TDM Plan

FINAL REPORT

Prepared for:

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1.0 Introduction

The Commonwealth of Virginia is addressing critical transportation needs for the I-95 corridor. Through a concurrent package of improvements, the Commonwealth will deliver congestion relief, enhance transit and provide new choices on I-95. These concurrent efforts related to the overall strategy to enhance travel and safety are listed below:

1. I-95 HOT/HOV Lanes
2. VDOT Seminary HOV/Transit ramp
3. Transit Improvements

This Final Report presents a recommended program for I-95 transit and transportation demand management (TDM) improvements and is a compilation of findings from the following three technical memoranda that were prepared as part of this study:

- ✔ *Technical Memorandum #1: Existing Service Characteristics*
- ✔ *Technical Memorandum #2: I-95 Corridor Transit and TDM Needs*
- ✔ *Technical Memorandum #3: I-95 Corridor Transit and TDM Plan Recommendations*

All three technical memoranda can be found at the end of this report.

This *I-95 Corridor Transit and TDM Plan* provides the Commonwealth of Virginia with a plan that will complement the I-95 HOT/HOV Lanes improvements. The plan has been developed with the intent of maximizing utilization of the HOT/HOV lanes network and responding to the demand for increased public transportation and ridesharing.

The *I-95 Corridor Transit and TDM Plan* was developed in collaboration with the Secretary of Transportation and the Virginia Public-Private Transportation Act Office. A multi-jurisdictional Stakeholder group was formed early in the study process to provide technical input into the study, with meetings at three key points during the course of the study.

Service and facility improvement recommendations are focused on the needs for commuter trips that originate within the I-95 travel corridor, south of I-495. The identified list of service and facility recommendations is limited to improvements that directly maximize capacity of the I-95 HOT/HOV lanes south of I-495. Consideration has also been given to potential impacts and needs at I-95 commuter trip destinations within I-495. Other corridor service needs, such as VRE service and facility expansion needs, have been identified in *Technical Memorandum #2*, but are not included in this study's plan recommendations, as they do not directly maximize capacity of the I-95 HOT/HOV lanes.

2.0 I-95 HOT/HOV Lane Project Definition

The Virginia Department of Transportation (VDOT) is advancing a new I-95 High Occupancy Toll/High Occupancy Vehicle (HOT/HOV) Lanes project to provide additional HOT and HOV capacity in the corridor and to create a seamless network for travelers along I-95 and I-495. In 2005, VDOT entered into an agreement with Fluor-Transurban to develop a HOV/Bus/HOT lanes system along I-395 and I-95 from the Pentagon area in Arlington County to Spotsylvania County. The project was delayed and VDOT has since decided to move forward with a redefined project. The new I-95 HOT/HOV Lanes project will create continuous HOT/HOV lanes on I-95 from the vicinity of Edsall Road on I-395 in Fairfax County to just south of US 17 (Mills Drive, south of Fredericksburg) in Spotsylvania County.

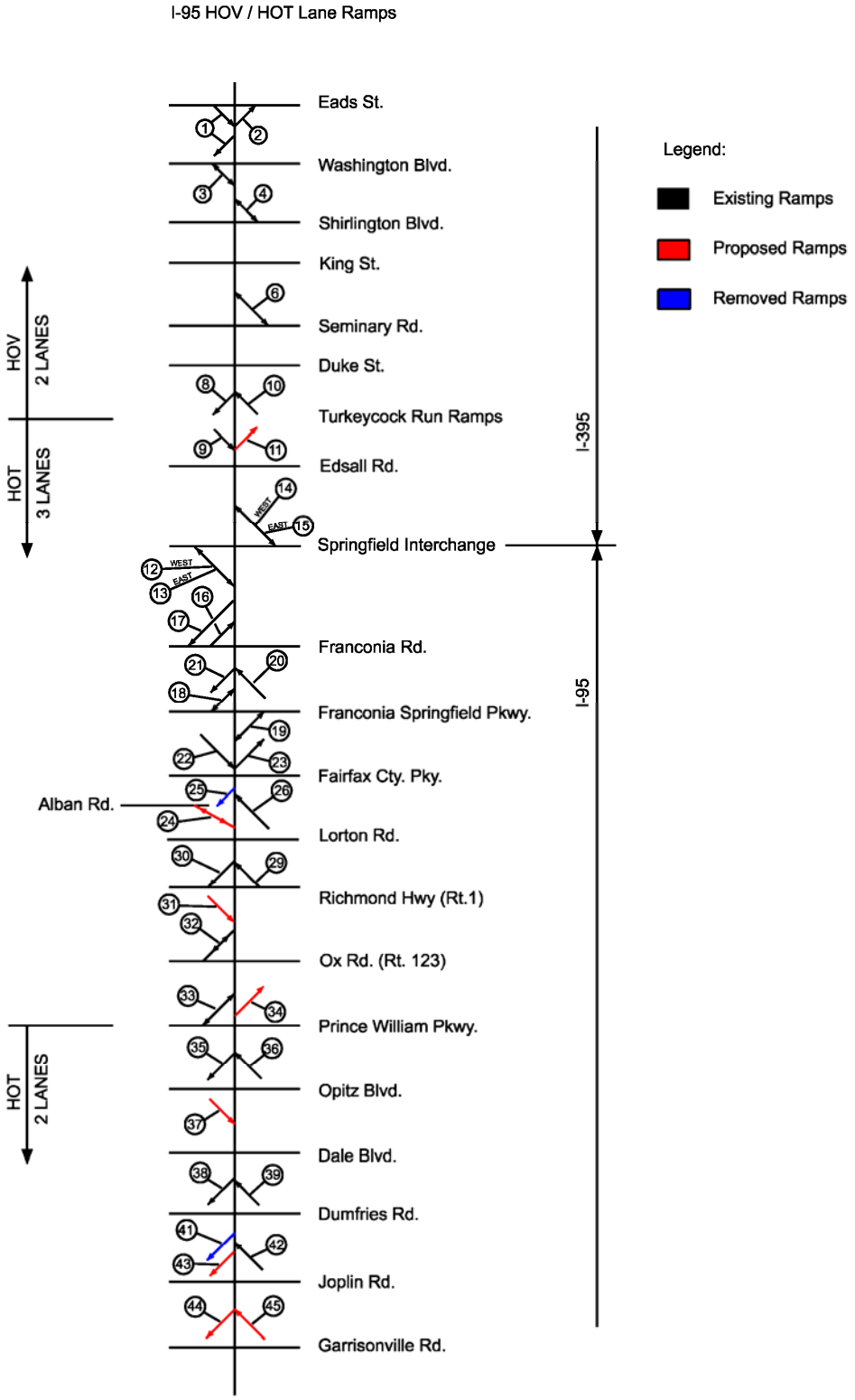
The portion of the project that is to be completed by 2015 will include the following:

- Constructing two new reversible HOT/HOV lanes for nine miles from Route 610/Garrisonville Road in Stafford County to Route 234/Dumfries Road in Prince William County, where the existing HOV lanes begin
- Widening of the existing HOV lanes from two to three lanes for 14 miles from Prince William Parkway to approximately two miles north of the Springfield Interchange, in the vicinity of Edsall Road
- Improvements to the existing two HOV lanes for six miles from Route 234 to Prince William Parkway
- New or improved access points between the HOT/HOV lanes and the general purpose lanes
- New access between the HOT/HOV lanes and Fairfax County Parkway (at Boudinot Drive)

Access points between HOT/HOV lanes and general purpose lanes are illustrated in **Figure 2-1** (schematic provided by VDOT). This project will create the following new access points:

- For southbound traffic, new flyover ramp access from HOT/HOV lanes to general purpose (GP) lanes between Joplin Road and Garrisonville Road
- For northbound traffic, new access from GP lanes to HOT/HOV lanes between Garrisonville Road and Joplin Road
- Removal of existing southbound access from HOV lanes to general purpose lanes south of Dumfries Road, and constructing a new flyover access ramp further south
- For southbound traffic, new access from GP lanes to HOT/HOV lanes south of Opitz Boulevard
- For northbound traffic, access from HOT/HOV lanes to GP lanes north of Prince William Parkway
- For southbound traffic, new ramp access from GP lanes to HOT/HOV lanes south of Route 1/ Richmond Highway
- For northbound traffic, flyover ramp access from HOT/HOV lanes to Boudinot Drive in the a.m. In the p.m., traffic flows are reversed, providing access from Boudinot Drive to southbound HOT/HOV lanes
- For northbound traffic, new flyover ramp access from HOT/HOV lanes to GP lanes north of Edsall Road

Figure 2-1
HOT/HOV Lane Access Schematic



Carpools with three or more people, vanpools and transit vehicles will have free access to the HOT/HOV Lanes network. The estimated cost of Phase 1 is $1 billion, and is being financed, constructed and operated under Virginia's Public-Private Transportation Act.

The HOT/HOV lanes are to be extended south to Spotsylvania County, with construction proposed by 2018. Two new HOT/HOV lanes are to be constructed in the median of I-95 from Route 610/ Garrisonville Road to US 17 (the Massaponax exit) in Spotsylvania County. Access ramps between HOT/HOV Lanes and general purpose lanes will generally be provided between each interchange.

Dynamic tolling will be used to adjust HOT lane tolls based on real-time traffic conditions, video technology to identify accidents, a series of electronic signs to communicate with drivers and state troopers to ensure enforcement. These strategies are to maintain travel speeds, make travel times more predictable and significantly reduce violators.

VDOT is also proceeding with a separate project. A new HOV ramp is to be constructed at the Mark Center at I-395 and Seminary Road. This ramp will provide access to the third level of the I-395/ Seminary Road interchange. Access to the third level will provide HOVs and buses with more direct access to the Mark Center via Seminary Road and Mark Center Drive. This project is to be completed by 2015 at an estimated cost of $80 million. This project will complement other short and mid-term improvements to the arterial street network to be implemented in conjunction with the Base Realignment and Closure (BRAC) 133 project at Mark Center.

3.0 Demographic and Travel Pattern Characteristics

An important task in this project has been the understanding of existing demographic characteristics and commuter travel patterns. The following section presents a summary of these existing characteristics. More detailed information can be found in *Technical Memorandum #1*.

3.1 Demographic Characteristics

The Metropolitan Washington Council of Governments (MWCOG) and Fredericksburg Area Metropolitan Planning Organization (FAMPO) regional travel demand forecast models were used to determine existing and future demographic characteristics along the I-95 corridor. Population and employment characteristics were determined for the years 2011, 2015 and 2035. Demographic data for the northern portion of the I-95 corridor was obtained from the MWCOG, as used in the approved 2010 Constrained Long-Range Transportation Plan, Version 2.2, Round 8. Demographic data for the southern portion of the corridor was obtained from the FAMPO data used in the FAMPO 2035 Long-Range Transportation Plan.

Tables 3-1 and **3-2** present population and employment projections for traffic analysis zones (TAZs) along the I-95 corridor. Though population and employment is much higher in the northern end of the corridor, growth rates are anticipated to be much higher in the south end of the corridor. Overall, the corridor population is projected to increase by 36% and employment by 45%.

Figures 3-1 and **3-2** illustrate projected 2035 population and employment densities for TAZs along the I-95 corridor. **Figure 3-4** presents 2009 minority population and **Figure 3-5** presents 2009 households below poverty in the I-95 corridor.

Table 3-1
I-95 Corridor Population Projections

County Area	Area Population 2011	2015	2035	2035 - 2015	Percent Change
Fairfax	182,767	188,196	207,333	24,566	13.4%
Pr. William	259,823	277,119	330,369	70,546	27.2%
Stafford	103,262	120,675	183,554	80,292	77.8%
Spots./Fred.	107,337	116,848	165,974	58,637	54.6%
Total	**653,189**	**702,838**	**887,230**	**234,041**	**35.8%**

Table 3-2
I-95 Corridor Employment Projections

County Area	Area Employment 2011	2015	2035	2035 - 2015	Percent Change
Fairfax	75,676	86,324	97,589	21,913	29.0%
Pr. William	71,921	77,261	105,223	33,302	46.3%
Stafford	37,866	43,311	62,004	24,138	63.7%
Spots./Fred.	53,145	56,741	82,192	29,047	54.7%
Total	**238,608**	**263,637**	**347,008**	**108,400**	**45.4%**

Figure 3-1
2035 Population Densities in I-95 Corridor

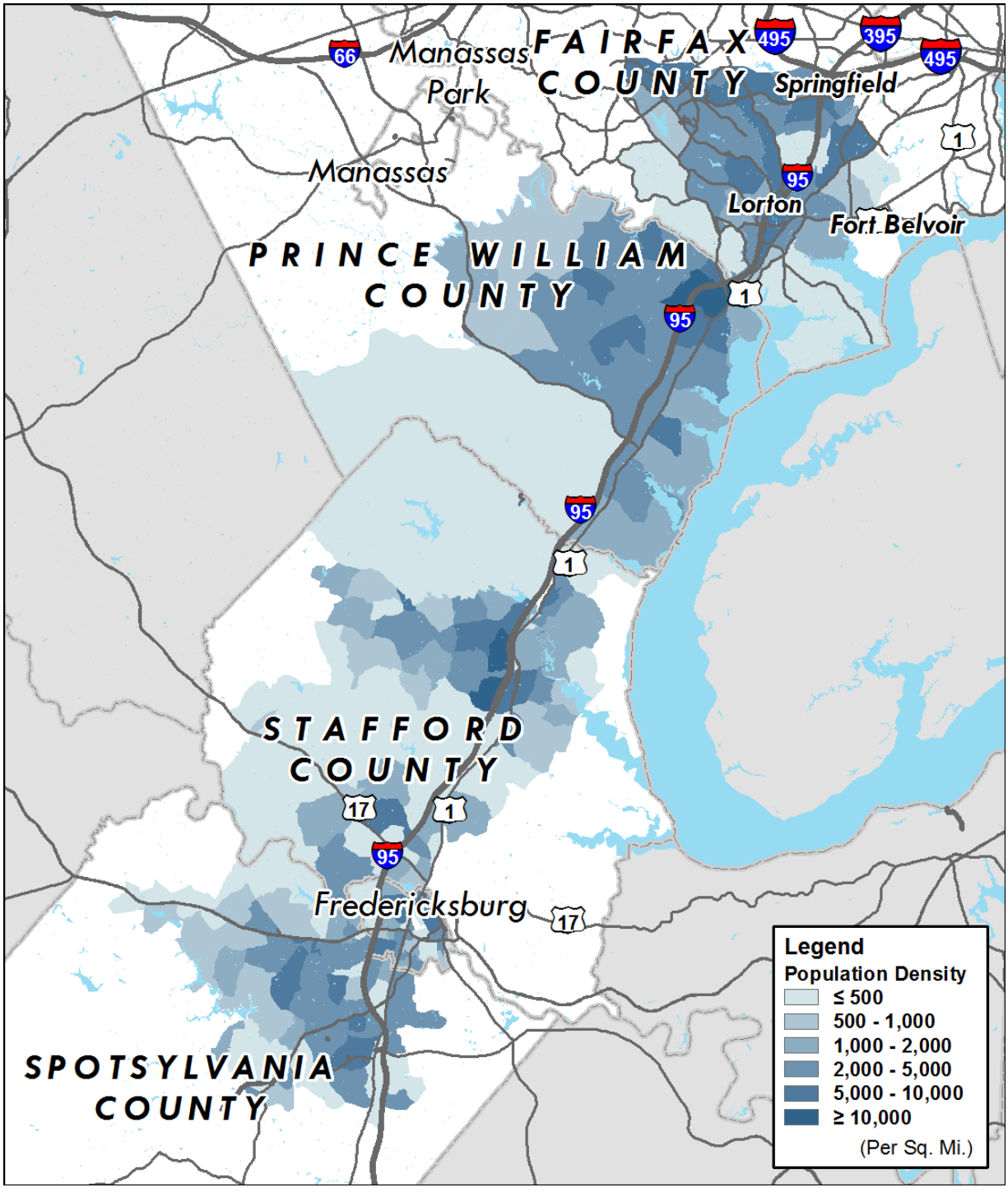


Figure 3-2
2035 Employment Densities in I-95 Corridor

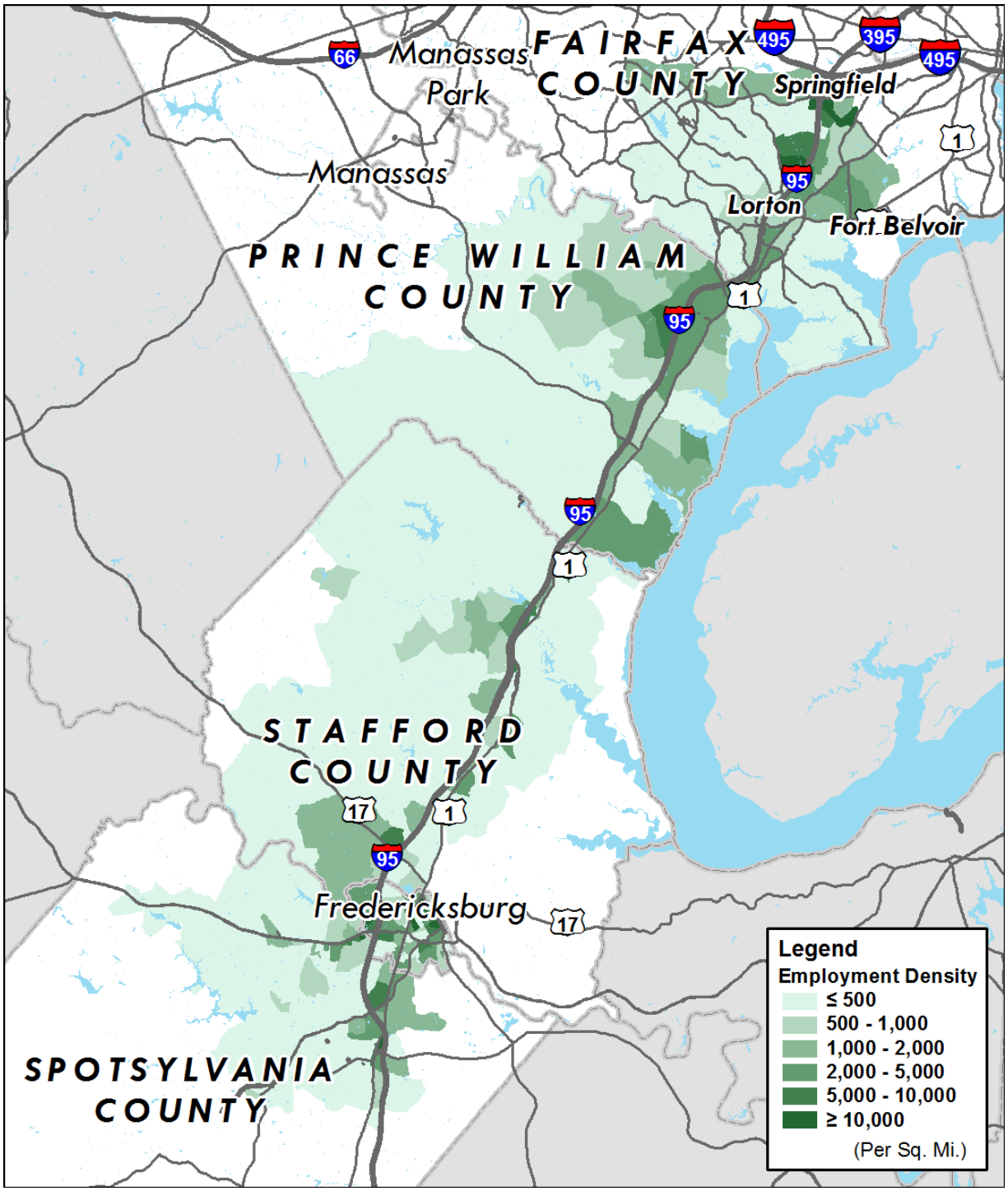


Figure 3-3
2009 Minority Population in I-95 Corridor

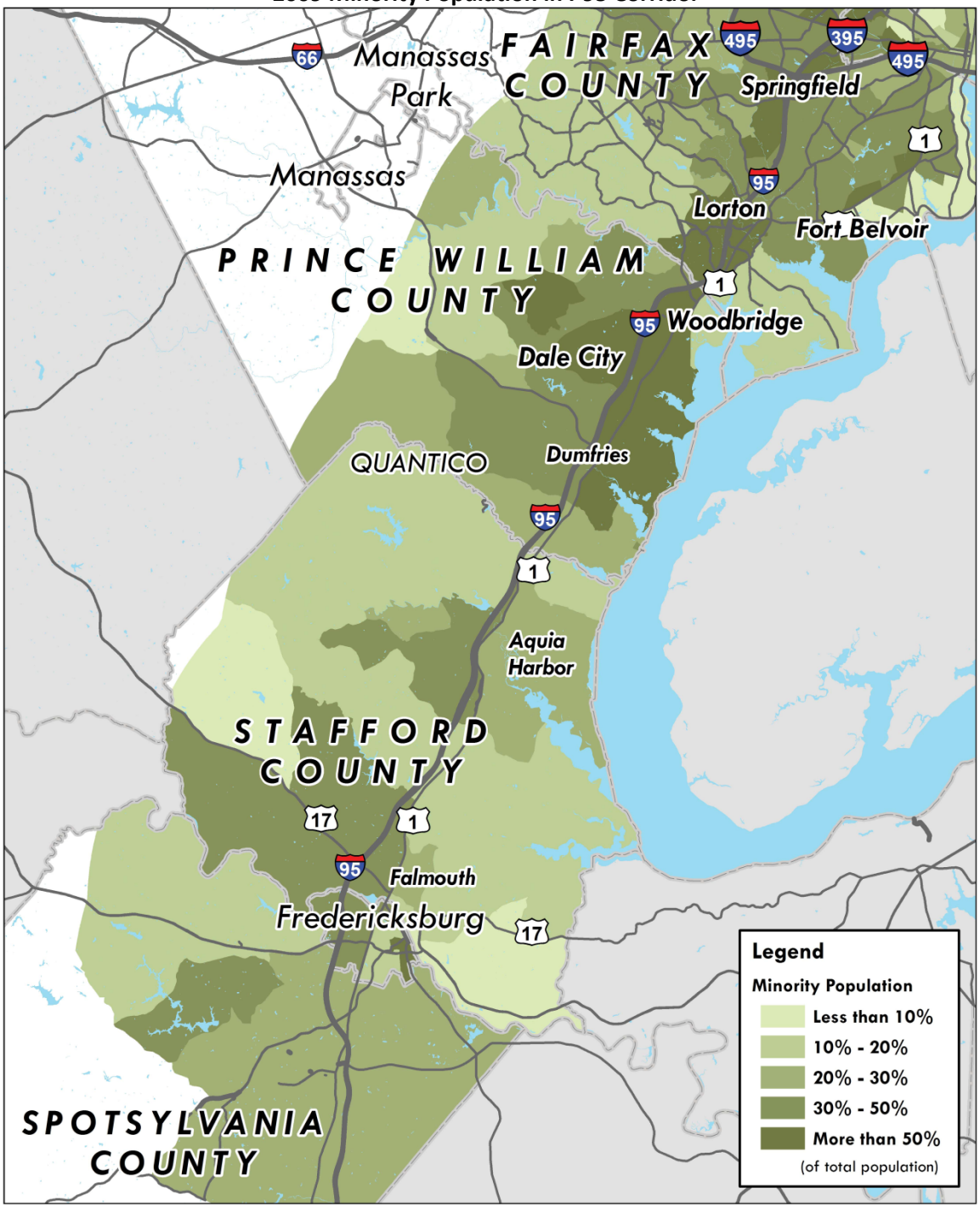
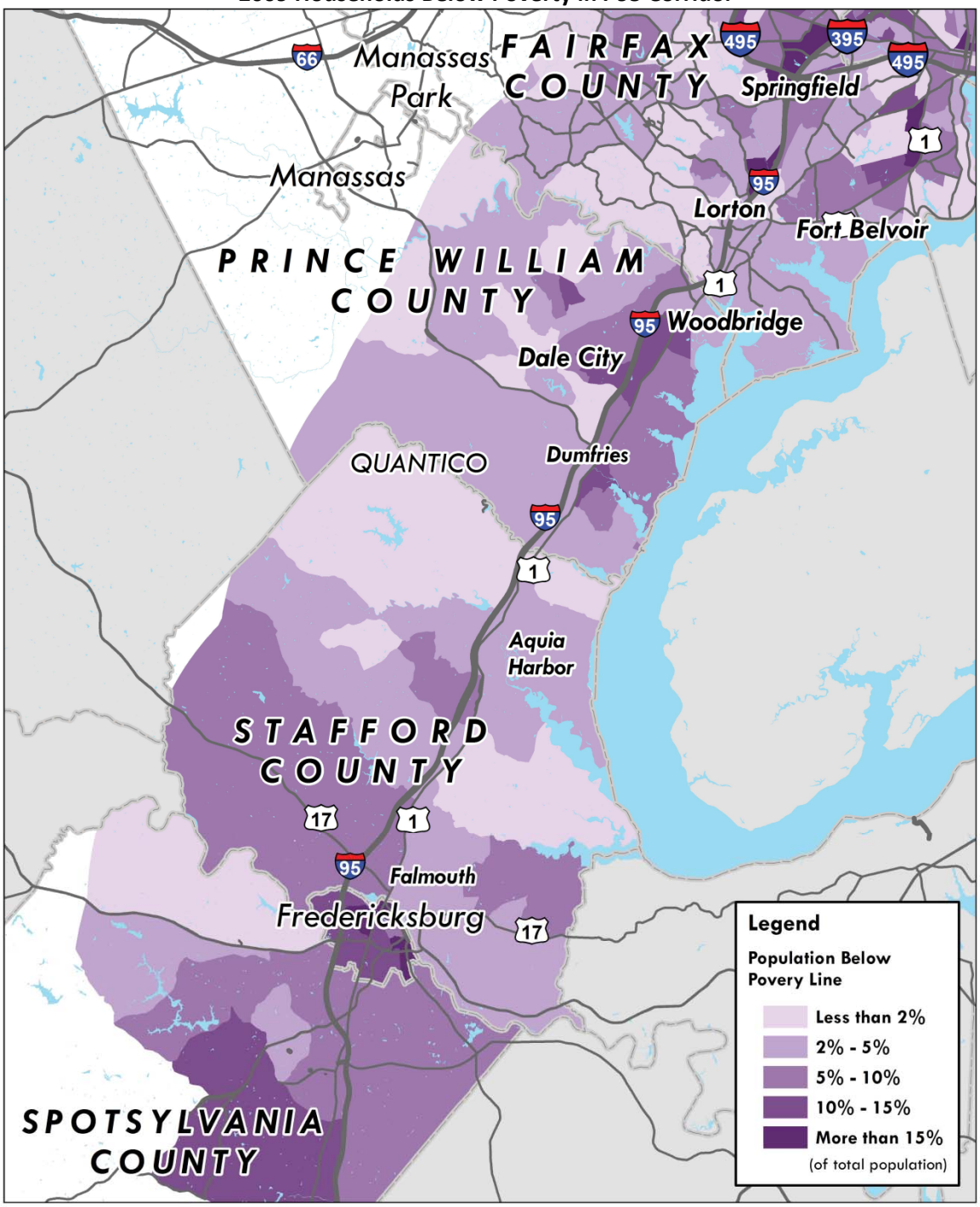


Figure 3-4
2009 Households Below Poverty in I-95 Corridor



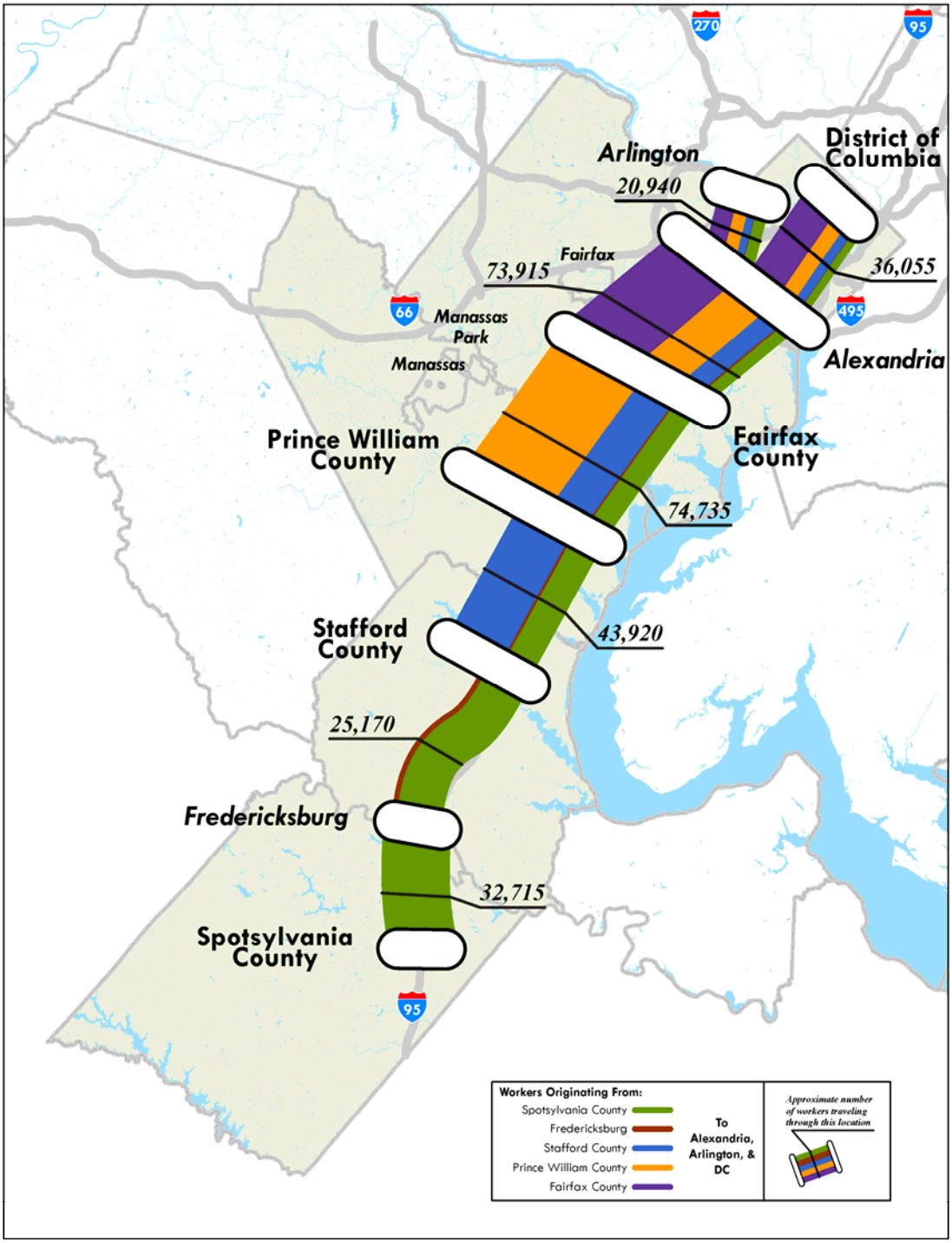
3.2 Existing Worker Travel Flows

Journey to work (i.e., home to work) travel flow information for the I-95 corridor was collected from the Census Transportation Planning Products (CTPP) program. The CTPP contains tabulated census demographic data that has been specially tabulated for transportation planners and other professionals who deal with the movement of people. The CTPP data used in this analysis is the most recently released and is based on the 2006-2008 Three-Year American Community Survey (ACS) data. Specifically, worker travel flow data was compiled from the CTPP.

Figure 3-3 shows worker flows for the I-95 corridor. Depicted worker flow data from southern Prince William County is shown in orange, while southern Fairfax County worker flow data is shown in purple. Depicted worker flow data from Spotsylvania County is shown in green, City of Fredericksburg is shown in maroon and Stafford County is shown in blue.

As shown in the figure, worker flows are greatest where the flows are combined, between Prince William County and southern Fairfax County. Over 74,000 workers are traveling north from the southern Prince William County and southern Fairfax County areas to destinations within Alexandria, Arlington and Washington, D.C. Almost 21,000 are traveling to Arlington and 36,000 are traveling to Washington, D.C.

Figure 3-3
Estimated Existing I-95 Corridor Worker Travel Flows



Source: 2006-2008 American Community Survey Data
Census Transportation Planning Products

4.0 Existing Transit/TDM Services and Facilities

The I-95 Corridor is served by several public and private transit service providers. There are many well-utilized park and ride lots within the corridor that support commuter bus services operated by the corridor's transit service providers. This corridor also has an extensive array of TDM programs in place that help reduce the number of single occupant vehicles on I-95. Following are general descriptions of existing transit services, park and ride facilities and TDM programs within the I-95 corridor. More detailed descriptions can be found in *Technical Memorandum #1*.

4.1 Corridor Transit Service Providers

Transit service providers in the I-95 corridor consist of:

- Fairfax Connector
- Washington Metropolitan Area Transit Authority (WMATA)
- Potomac and Rappahannock Transportation Commission (PRTC)
- FREDericksburg Regional Transit (FRED)
- Quick's Bus Company
- Martz Group
- Virginia Railway Express (VRE)

Quick's and Martz are private bus companies; the other five are public transit providers. Following are brief descriptions of services provided by each service provider. More detailed descriptions can be found in *Technical Memorandum #1*.

Fairfax Connector presently operates one route that uses I-95/I-395 to/from the Pentagon – Route 395 (previously labeled Route 380-D). All other Fairfax Connector routes in the corridor are local routes, with most providing service to and from the Franconia-Springfield Metrorail station.

WMATA: There is one Metrorail Station in the corridor –the Franconia-Springfield Station – located along Franconia-Springfield Parkway, just east of I-95 (south of the Springfield Mall). This station is the end-of-line station for the Blue Line. Route 18 is the primary Metrobus route that serves the I-95/I-395 corridor to/from the Pentagon. There are several line patterns for Route 18. Other Metrobus routes operate to and from the Franconia-Springfield Metrorail station. Routes that connect to the Franconia-Springfield Metrorail Station tend to be well-utilized.

PRTC offers a comprehensive network of commuter and local bus services in Prince William County. OmniRide is PRTC's commuter bus service. PRTC operates 10 commuter bus routes in the I-95 corridor from the Woodbridge, Dale City, Lake Ridge, Montclair and Dumfries communities. Destinations include downtown Washington, D.C., the Pentagon, Crystal City, Rosslyn/Ballston, Capitol Hill, the Navy Yard area and Tysons Corner. PRTC OmniRide routes are well utilized, with over 5,800 average daily passenger trips. Metro Direct is a commute and reverse commute bus service that provides service to Metrorail stations. PRTC operates one Metro Direct route in the I-95 corridor – from Lake Ridge to the Franconia-Springfield Metro Station. The PRTC Metro Direct route that operates in this corridor carries over 800 average daily passenger trips.

PRTC OmniRide routes typically start at park and ride lot locations away from the I-95 corridor and circulate through neighborhoods before stopping at a park and ride lot immediately adjacent to I-95. Buses are typically less than ½ full when arriving at an I-95 park and ride lot. These buses, however, tend to leave full from the I-95 park and ride lot. Thus, passengers are drawn more to the lots closest to I-95.

PRTC's ability to attract more ridership on OmniRide routes is limited by two factors – park and ride lot capacities and limitations at the existing bus maintenance facility. Many of the lots served by OmniRide routes are at or near capacity. PRTC also does not have the ability to expand bus storage or maintenance at its existing bus maintenance facility. PRTC is moving forward with plans to construct a second bus maintenance facility in the western portion of the county, which will free up capacity at its existing facility. The western maintenance facility is anticipated to be operational in late 2015/early 2016.

FRED provides fixed route transit service with deviations to the Fredericksburg area, including the City of Fredericksburg, Spotsylvania, Stafford, Caroline and King George Counties. Included in FRED's array of transit services are VRE feeder services to the Fredericksburg VRE Station.

Quick's and Martz: Quick's provides commuter service from Spotsylvania and Stafford counties to the Washington, D.C. area. Most of Quick's route patterns provide service to destinations outside of the Washington, D.C. core. Quick's operates 10 commuter bus trips in the a.m. and 10 in the p.m.

Martz provides 14 commuter trips in the a.m. and 14 in the p.m. from the Fredericksburg region. Nearly all Martz bus trips serve the central core of Washington, D.C. Most of the park and ride lots in Stafford and Spotsylvania counties are served by both Quick's and Martz.

Martz and Quick's routes are estimated to carry 800 to 900 passenger trips in each peak period (i.e., 1,600 to 1,800 daily one-way passenger trips). This reflects an average of 30 to 40 passengers per bus trip. Martz and Quick's round trip fares are $24 to $28 for a one-day ticket. PRTC's fares for a round trip are $10.50 with a SmarTrip card and $14 cash. Thus, there are likely residents from the southern portion of the corridor that drive to Prince William County lots to use OmniRide service, as that service is less expensive and more frequent.

VRE provides commuter rail service in the corridor from Fredericksburg to Union Station in Washington, D.C. VRE stations located in Fairfax County are: Franconia-Springfield and Lorton. Stations that are within Prince William County are: Woodbridge, Rippon and Quantico. Brook and Leeland Road stations are located in Stafford County. Fredericksburg is located in downtown Fredericksburg. VRE operates seven inbound and seven outbound trips. In addition to VRE-operated trips, VRE has an Amtrak Cross Honor agreement in place with select Amtrak trains. VRE park and ride utilization rates tend to be higher at the south end of the rail line, with many station lots operating at capacity.

VRE is well-utilized, with over 10,000 trips a day. Many VRE train trips are operating with standing passenger loads. VRE's potential to expand ridership is primarily limited by its available passenger car fleet, midday storage availability and parking availability at rail station parking lots.

Figure 4-1 presents a.m. and p.m. peak period bus trips that operate on I-95/I-395 by the above-noted service providers and estimated average daily ridership on the I-95 commuter buses. It is important to note that this is not a comprehensive listing of all bus trips on I-95/I-395. Other public and private transit operators also utilize I-95/I-395 and are not reflected in this figure.

4.2 Corridor Park and Ride Lots

VDOT owns or leases several park and ride lots in the I-95 corridor. In some cases, this is supplemented by County-owned park and ride lots and other private lots with leasing arrangements. Most lots are served by transit, and many are also used by carpools, vanpools and sluggers. **Figures 4-2** through **4-4** illustrate park and ride lot locations in the I-95 corridor. **Table 4-1** below presents approximate park and ride space totals by county and occupancy/utilization rates. It is important to note that many individual lots are operating at or beyond capacity. Those lots tend to be lots located close to I-95, well-served by transit and utilized by vanpoolers. Specific park and ride lot utilization rates are presented in *Technical Memorandum #1*.

Table 4-1
I-95 Corridor Park and Ride Lot Spaces by Jurisdiction
(Non-Rail Parking Lots)

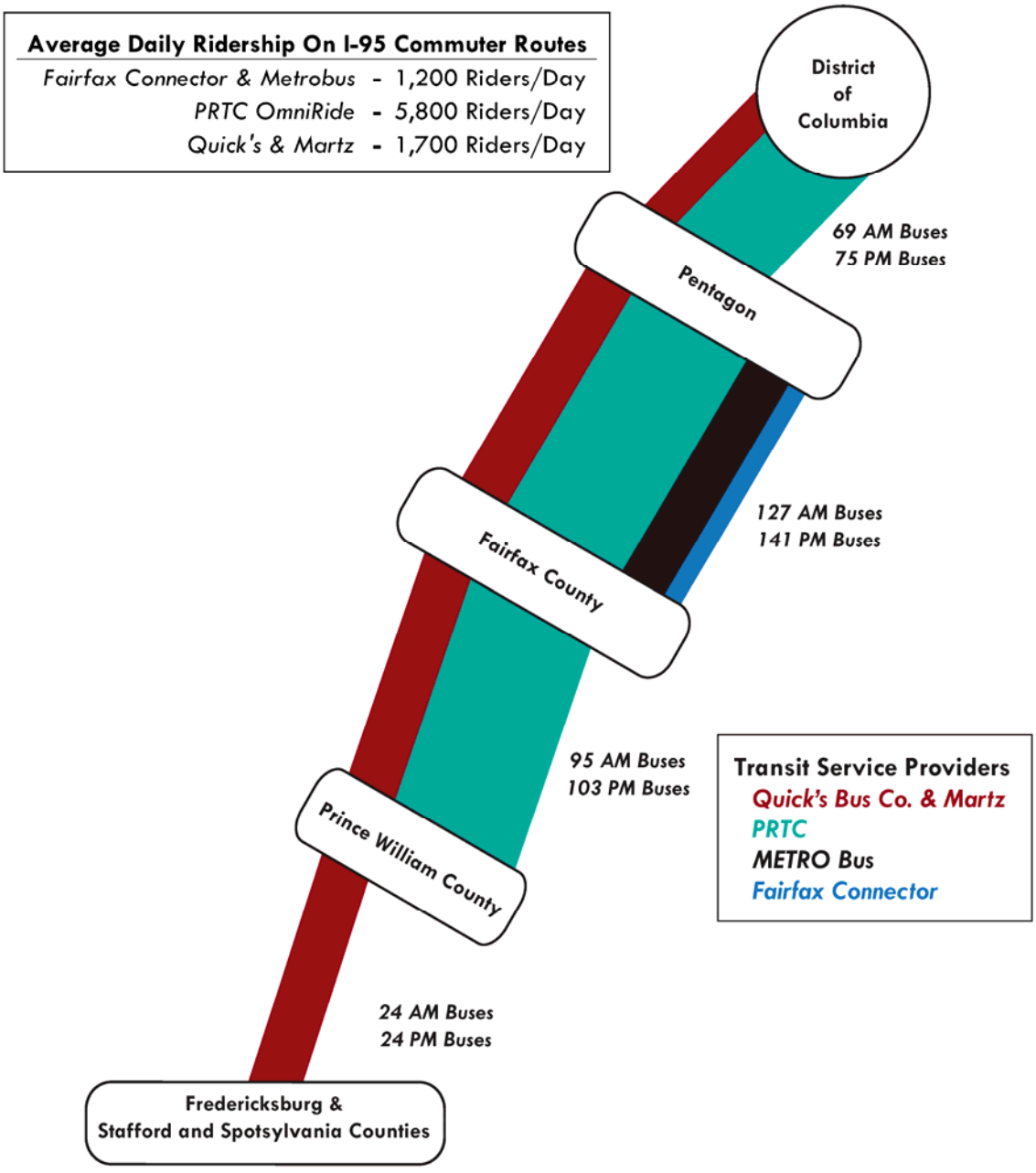
Jurisdiction	Park and Ride Spaces	Cumulative Utilization Rate
Fairfax County	2,806	66%
Prince William County	7,741	85%
Stafford and Spotsylvania Counties	5,525	85%

Bus service and TDM Program expansion cannot happen without a concurrent expansion of park and ride lots. Many of the major parking and ride lots in the corridor are at capacity, or close to capacity. In particular, lots that are served by transit with several capacity constraints are:

Springfield Plaza
Horner Road
US 1/Route 234
Lake Ridge
Old Bridge Rd./Route 123
Potomac Mills
Tackets Mill
PRTC Transit Center
Garrisonville Rd./Staffordborough Blvd.
Garrisonville Rd./Mine Road
Stafford (VA 630)
Route 3/Gordon Road
Route 3/Salem Church Road

VDOT has plans to expand park and ride lot capacity in the corridor. Many of VDOT's expansion plans address needs identified in the prior I-95/I-395 Transit and TDM Plan. VDOT is proceeding with plans to add two lots in the north portion of the corridor that will provide 1,300 spaces and with plans to add up to 2,000 spaces at south corridor park and ride lots.

Figure 4-1
I-95/I-395 Peak Period Commuter Service Bus Trips
By I-95 Corridor Transit Service Providers



Note: Bus volumes shown in figure reflect bus trips originating from the I-95 corridor, south of I-495. Other bus services also operate in this corridor and are not reflected in this figure.

Figure 4-2
Fairfax County Park and Ride Lot Locations

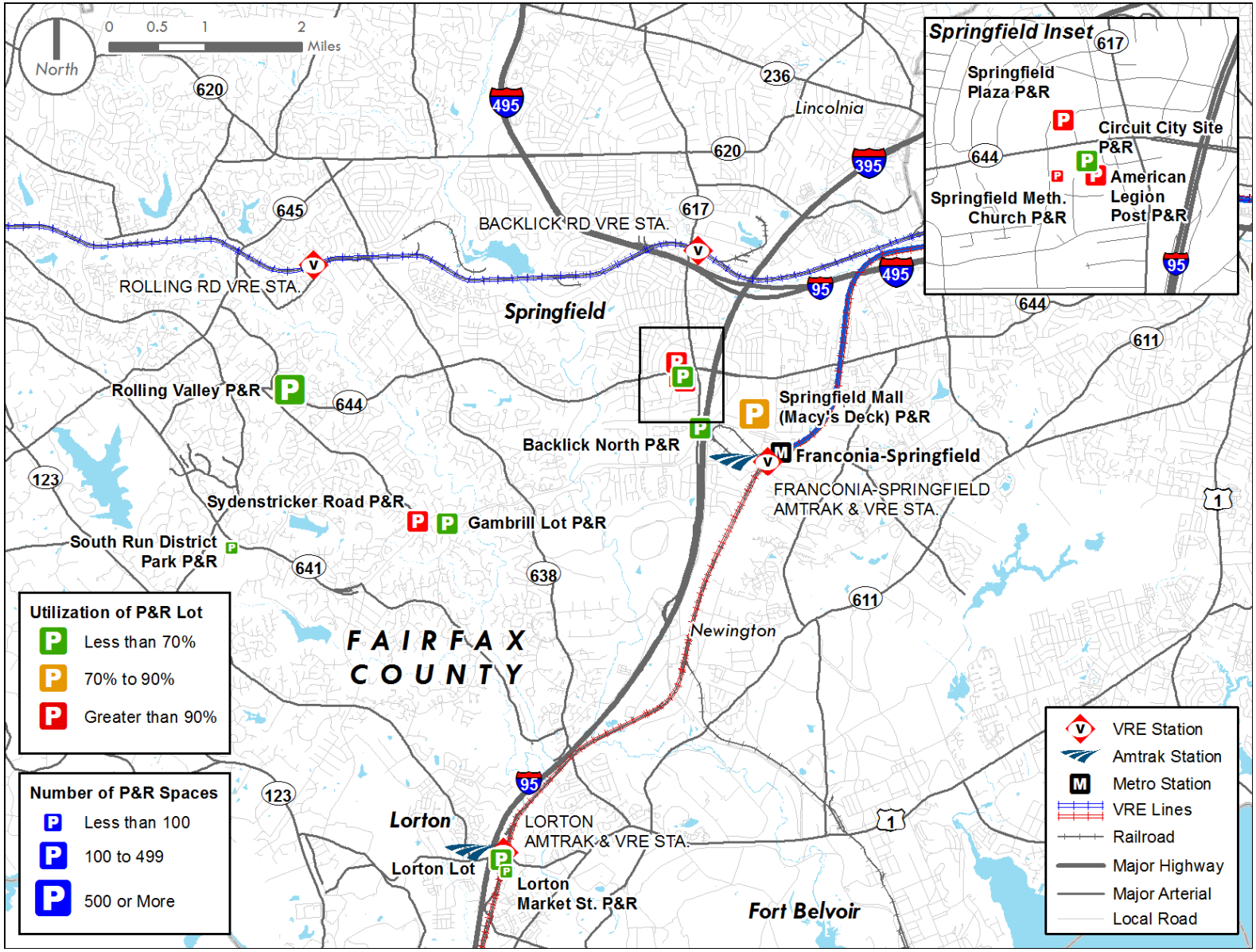


Figure 4-3
Prince William County Park and Ride Lot Locations

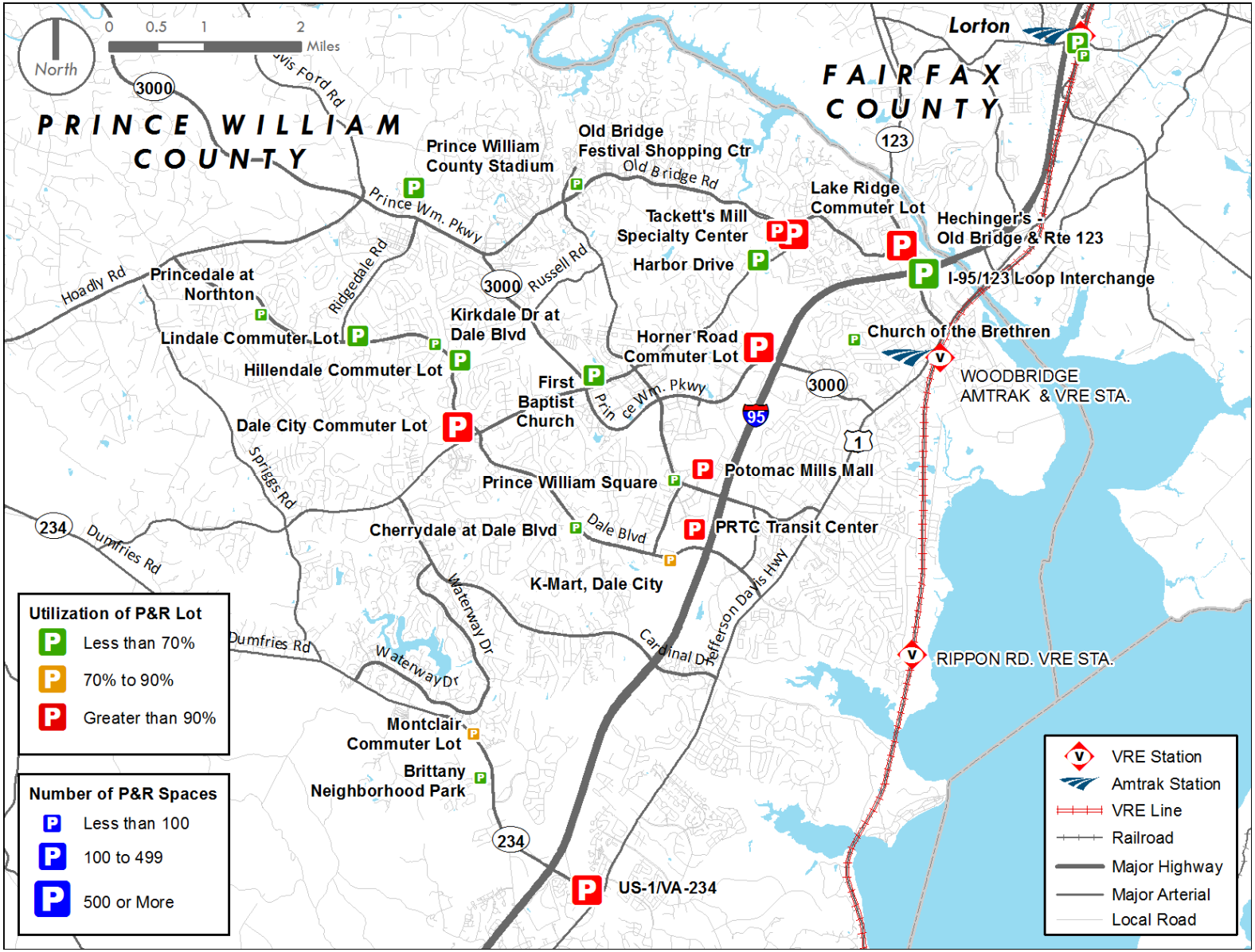
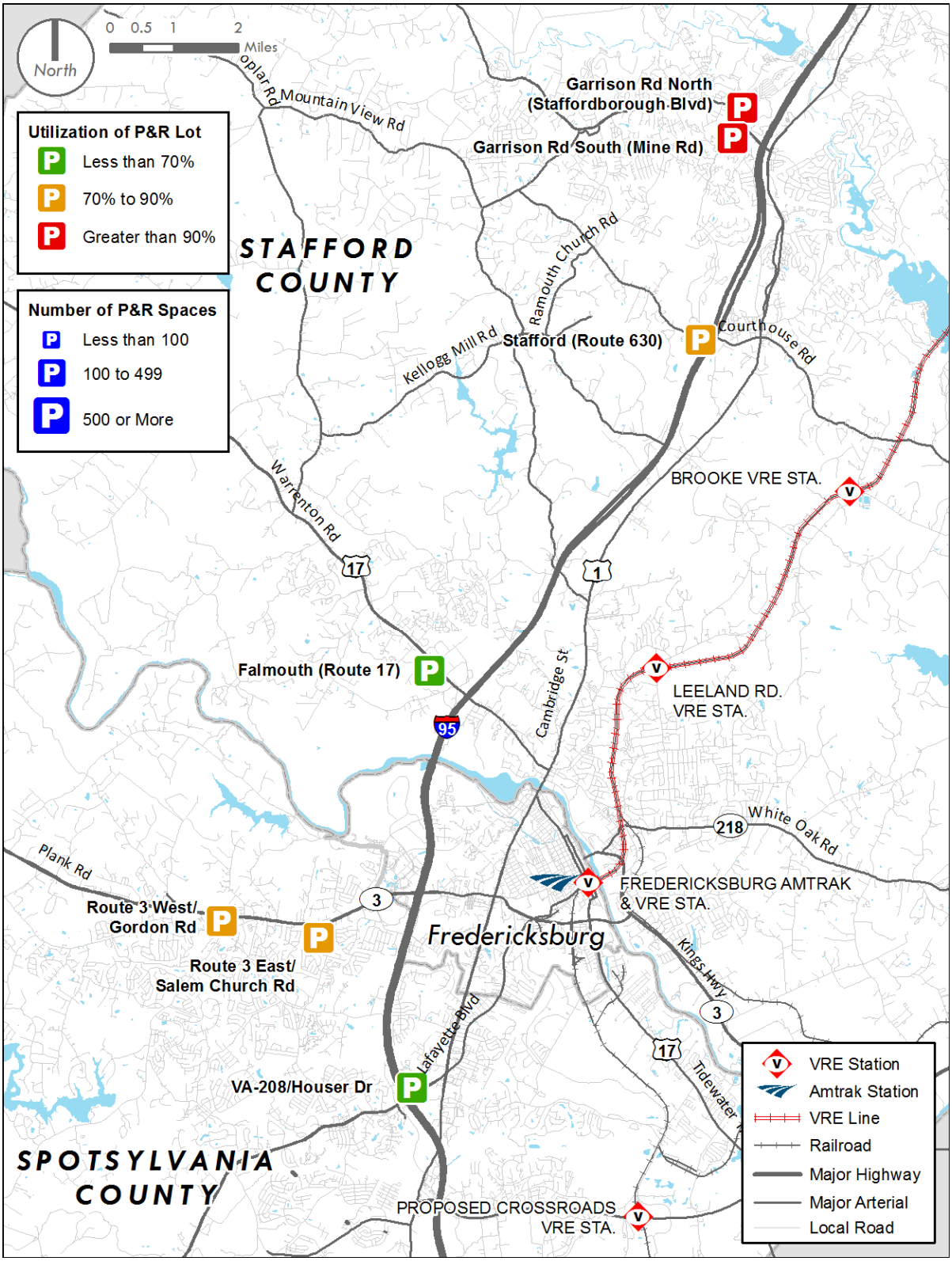


Figure 4-4
Stafford and Spotsylvania County Park and Ride Lot Locations



4.3 TDM Programs

Several TDM programs are in place in the I-95 corridor that have reduced single occupant vehicle usage in the corridor. Telework continues to grow in popularity in the Washington, D.C. area. There are a few privately operated telework centers in operation in the corridor. Dynamic ridesharing (slugging) also continues to grow in this corridor. A 2009 survey by VDOT estimates that there are 6,450 sluggers that originate from 15 locations in the corridor. About 25 percent of sluggers originate from the Horner Road Lot. About one third of all sluggers are destined to the Pentagon.

Commuter Connections serves as an umbrella agency for local TDM programs. TDM agencies within the corridor include Alexandria's Local Motion, the Fairfax County Transportation Services Group, OmniMatch and GWRideConnect. These TDM agencies provide employer services that are aimed at reducing single occupant vehicle travel. Both OmniMatch and GWRideConnect administer large vanpool programs, with GWRideConnect overseeing more than 400 vanpools.

Finally, it is important to note that the corridor's BRAC projects include funding for a Transportation Management Program Office that will be responsible for promoting alternatives to single occupant vehicle travel.

5.0 I-95 Corridor Plan Recommendations

An analysis of I-95 corridor transit and TDM program needs was completed and documented in *Technical Memorandum #2*. Needs were identified as those that directly maximize I-95 HOT/HOV lane capacity and other I-95 corridor needs. Following is a summary of costs and phasing recommendations for improvements that that directly maximize I-95 HOT/HOV lane capacity, as presented in *Technical Memorandum #3*.

5.1 Park and Ride Lot Recommendations

As discussed in *Technical Memorandum #2*, a district-level assessment of existing park and ride lot utilization and anticipated expansion needs resulted in the determination of needs that are greater than what was proposed in the prior *I-95/I-395 Transit and TDM Study*. Expansion needs that are anticipated to address existing lot capacity deficiencies and anticipated population growth within the I-95 travel shed corridor are as follows:

Additional Space Needs in North Corridor Area	4,000 spaces
Additional Space Needs in South Corridor Area	5,575 spaces
Total Estimated Park and Ride Space Requirement	***9,575 spaces***

As noted in previous technical memoranda, VDOT is proceeding with plans to construct 3,300 spaces. Thus, the estimated net additional need is for **6,275 spaces** (or 9,575 minus 3,300).

The park and ride phasing recommendations acknowledge that the 3,300 spaces VDOT is proceeding with for the I-95 corridor (funded spaces) are anticipated to be complete by approximately 2015, with the 1,300 spaces in the north corridor area (i.e., Telegraph Road and Saratoga lot) complete in 2012-2013 and the 2,000 spaces in the south corridor area (i.e., Route 3/Gordon Road and Garrisonville Road/Staffordborough Boulevard) complete by approximately 2015.

The remaining 6,275 needed spaces are assumed to be implemented in five-year increments from 2020 to 2030, as shown in **Table 5-1** and **Figure 5-1**. Phasing of these spaces is cognizant of bus transit service phasing discussed in the next section, as well as discussions with VDOT regarding park and ride priorities.

Expansion of park and ride lot spaces has been recommended by geographic area/district. However, it is important that there be flexibility for VDOT and local jurisdictions to work together to adjust locations of additional park and ride spaces as necessary during more detailed park and ride lot siting analyses, based on more current estimates of demand, land availability and transit service. Further, FAMPO is presently finalizing a park and ride lot study that is identifying potential locations for new park and ride lots and/or expansion of existing lots. Recommendations from that study effort should be utilized when identifying potential locations for the additional park and ride spaces that are recommended from this study effort.

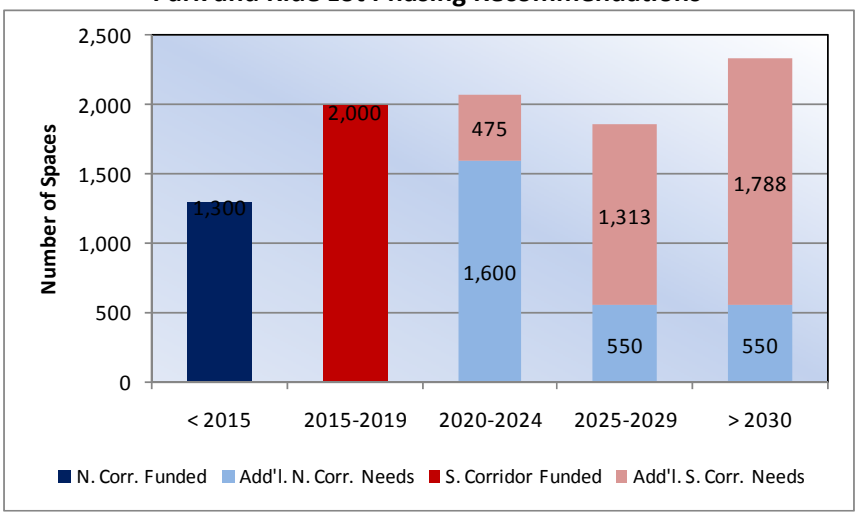
Table 5-1
Park and Ride Lot Phasing Recommendations
(Number of Spaces)

Geographic Area	Improvement Description	< 2015	2015-2019	2020-2024	2025-2029	2030-2034	Total
Fairfax District	Saratoga Lot* (2013)	600					**600**
	Additional Needs			250			**250**
Prince William District 1	Additional Needs				550	550	**1,100**
Prince William District 2	Telegraph Rd* (2012)	700					**700**
	Additional Needs			950			**950**
Prince William District 3	Additional Needs			400			**400**
Stafford District 1	Staffordborough Rd. Lot Expansion* (2015)		1,000				**1,000**
	Additional Needs				650	650	**1,300**
Stafford District 2	Additional Needs			475		475	**950**
Fredericksburg &	Route 3 (2017)*		1,000				**1,000**
Spotsylvania District	Additional Needs				663	663	**1,325**
TOTALS		**1,300**	**2,000**	**2,075**	**1,863**	**2,338**	**9,575**
Previously Committed Spaces:		**1,300**	**2,000**	**0**	**0**	**0**	**3,300**
Additional Recommended Spaces:		**0**	**0**	**2,075**	**1,863**	**2,338**	**6,275**

Notes:

1. *Lots with (*) are already programmed for construction by VDOT.*

Figure 5-1
Park and Ride Lot Phasing Recommendations

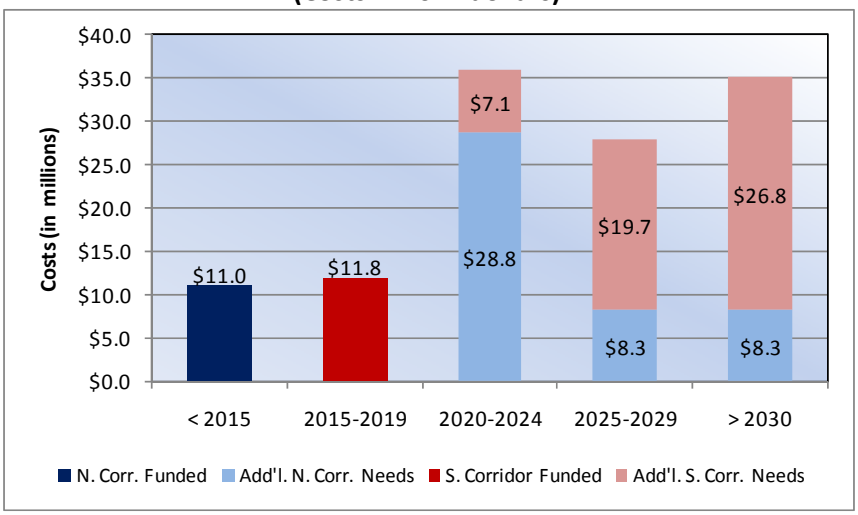


North Corridor defined as Fairfax and Prince William Counties, South Corridor as Spotsylvania & Stafford Counties

Total capital costs are estimated to be $121.7 million for the 9,575 park and ride spaces needed in the I-95 travel shed corridor (in 2011 dollars). Of this total, $22.8 million is committed towards the 3,300 spaces with which VDOT is proceeding, leaving $98.9 million to be included in the State's Six-Year Improvement Program. **Figure 5-2** present estimates of capital costs by phasing increment. Total estimated capital costs (in current year dollars) for the additional spaces by five-year increment are as follows:

- Between 2015 and 2020, $35.9 million
- Between 2020 and 2025, $27.9 million
- Between 2025 and 2030, $35.1 million
- ***Total 2015 to 2030= $98.9 million***

Figure 5-2
Park and Ride Lot Phased Capital Cost Estimates
(Costs in 2011 dollars)



North Corridor defined as Fairfax and Prince William Counties, South Corridor as Spotsylvania & Stafford Counties

5.2 Bus Transit Expansion Recommendations

The prior *I-95/I-395 Transit and TDM Study* identified a need for significant expansion of bus services in the corridor. As discussed in *Technical Memorandum #2*, the process of validating and modifying the prior study's stated bus service needs involved comparing the prior recommendations to current service plan proposals, understanding existing bus service utilization (e.g., bus loads), assessing demographic forecasts for each district in relation to transit service levels and discussing potential service needs with service provider staff. From this effort, *Technical Memorandum #2* identified a refined set of bus service needs for the corridor.

The recommendations for bus transit service expansion include only those route improvements that would directly utilize the I-95 HOT/HOV lanes. The recommended improvements include expansion of commuter services from Spotsylvania, Stafford, Prince William and Fairfax counties. These improvements would serve destinations such as central Washington, D.C., the Pentagon area, Rosslyn, Mark Center, Tysons Corner, Fort Belvoir North and the Franconia-Springfield Metrorail Station.

The service plans recommended in this study are based on an analysis of needs that took into consideration existing service utilization, corridor demographic growth and discussions with corridor service providers. As service providers proceed with implementation of expanded service, flexibility for the local service providers will be important, with service patterns and service levels adjusted as necessary based on a more current assessment of ridership demand.

It is important to note that there are capacity constraints at the Pentagon transit center and in the Crystal City/Pentagon City area. As noted in *Technical Memorandum #2*, potential strategies that may need to be explored to accommodate any further expansion at these locations include:

- Careful scheduling management that redistributes bus trips outside of the "peak of the peak" time periods.
- Splitting trips that presently serve multiple destinations into two or more routes, thus increasing seat capacity to each destination.
- Routing new trips to the Franconia-Springfield Metrorail Station instead of the Pentagon, with passengers continuing their trip via the Metrorail Blue Line. Coordination will be required with WMATA, Fairfax Connector and Department of Defense (DoD) shuttle service at this station.
- Longer-term, consideration of an off-site bus staging area at the Pentagon and possibly a transit center near the Crystal City Metro Station, with ITS measures in place that could possibly increase bus bay utilization.

Finally, it is important to note this study's transit service expansion recommendations for Stafford and Spotsylvania Counties assume the continuation of privately operated transit service in the future, and that demand will exist for these private operators to expand service at a rate consistent with population growth. At some point in the future, consideration may need to be given to public participation in the provision of commuter bus service in Stafford and Spotsylvania Counties, to ensure the continuation and expansion of transit with service levels and service patterns beneficial for the I-95 corridor.

Table 5-2 presents the estimated annual revenue-hours and proposed implementation year for the bus service expansion routes. The listing of route improvements are divided between committed service improvements and those that are additional service needs. Committed service improvements are

assumed to be implemented prior to 2015, and include routes in Fairfax and Prince William counties, as well as BRAC-related service improvements. The additional service needs have been phased into five-year increments from 2015 through 2030, drawing from adopted Transit Development Plans (TDPs) and population growth projections. The total proposed increase in annual revenue-hours for services that would operate in the I-95 HOT/HOV lanes is 47,940. **Figure 5-3** illustrates the proposed level of commuter bus service by county of origin and by destination. **Tables 5-3** and **5-4** summarize commuter bus service levels by peak period.

A total of 46 additional buses are required to implement the non-committed service improvements that would utilize the I-95 HOT/HOV lanes. A total of $23.4 million would be required to purchase peak buses and spares for the non-committed service improvements utilizing the I-95 HOT/HOV lanes (in 2011 dollars). Bus purchase recommendations include replacing the retirement-eligible buses that PRTC recently put back into service to address current bus overcrowding issues. Note that these additional bus requirements do not take into account bus life cycles and bus replacement costs over the plan's timeframe.

Figure 5-4 summarizes the estimated annual operations & maintenance (O&M) costs for the bus service expansion routes. **Table 5-5** presents estimated O&M costs for each bus service expansion route. This table does not include costs associated with service improvements that are already committed for implementation. An average annual O&M cost of $120 per revenue-hour has been assumed based on a review of current costs for WMATA, Fairfax Connector and PRTC. The calculations of net O&M costs reflect net O&M costs after fare collection, based on assumed farebox recovery ratios for the various services/operators (noted in footnotes of the tables).

The total estimated annual net O&M cost for all improvements associated with routes that operate in the I-95 HOT/HOV lanes is $2.47 million (in 2011 dollars). Additional annual O&M costs builds with the phased implementation of service expansion, with the full $2.47 million in additional O&M costs beginning in 2025, as illustrated in Figure 3-2. **Table 5-3** also presents the cumulative O&M costs through 2035, taking into account the proposed implementation year (e.g., an improvement proposed for 2020 would have 15 cumulative years of O&M). The additional net O&M costs through 2035 are estimated at $39.0 million for routes that would operate in the I-95 HOT/HOV lanes (in 2011 dollars).

Table 5-2
Bus Service Expansion Recommendations – Revenue-Hours and Phasing

Geographic Area	Imrpr. Status	Operator	Improvement Description	Annual Revenue-Hrs.	Impl. Year
Fairfax County	Committed Service Improvements	Fairfax	I-495 HOT Lane Service - Lorton-Tysons	Commmitted.	< 2015
		Fairfax	I-495 HOT Lane Service - Franconia/Springfield-Tysons	Commmitted.	< 2015
	Additional Service Needs	Fairfax	Restructure Tysons service to stop at Saratoga pnr	765	2015
		Fairfax or	New: Saratoga-Pentagon Express - 5 a.m. and 5 p.m. trips	1,913	2015
Prince William County	Committed Service Improvements	OmniRide	Permanently operate additional OmniRide trips that were recently implementd to address overcrowding issues	4,208	2015
	Additional I-95 Corridor Service Needs	OmniRide	Lake-Ridge-Washington, D.C. - add 3 a.m. and 4 pm. trips	2,678	2025
		OmniRide	Lake Ridge-Pentagon/Crystal City - add 3 a.m. and 3 p.m. trips	2,295	2025
		OmniRide	New Service - Lake Ridge to Mark Center - 4 a.m. and 4 p.m. trips	3,060	2015
		OmniRide	Dale City/Potomac Mills-Washington, D.C. - add 4 a.m. and 5 p.m. trips	3,443	2020
		OmniRide	Dale City/Potomac Mills-Pentagon/Crystal City - add 3 a.m. and 4 p.m. trips	2,678	2025
		OmniRide	Dale City/Potomac Mills-Rosslyn/Balston - add 2 a.m. and 2 p.m. trips	1,530	2020
		OmniRide	New Service: Dale City/Potomac Mills-Mark Center - 4 a.m. and 4 p.m. trips	3,060	2015
		OmniRide	New Service: Dale City/Potomac Mills-Merrifield - 4 a.m. and 4 p.m. trips	3,060	2020
		OmniRide	Monclair/Dumfries-Pentagon/DC - Add 2 a.m. and 3 p.m. trips	1,913	2020
		OmniRide	New Service: Montclair/Dumfries-Tysons Corner - 4 a.m. and 4 p.m. trips	3,060	2020
		MetroDirect	Prince William MetroDirect - Increase peak period frequencies to 20-min.	2,040	2020
Stafford and Spotsylvania Counties	Additional I-95 Corridor Service Needs	Private Op's.	Washington D.C. Service - add 6 trips each peak period	4,590	2020
		Private Op's.	Pentagon/Crystal City Service - add 2 trips each peak period	1,530	2020
		Private Op's.	Mark Center Service - add 2 trips each peak period	1,530	2020
		Private Op's.	Navy Yard/DOT Service - add 1 trip each peak period	765	2025
		Private Op's.	Rosslyn Service - add 2 trips each peak period	1,530	2025
		Private Op's.	Fort Belvoir Service - add 1 trip each peak period	765	2015
		Private Op's.	Tysons Corner Service - new service, 2 trips each peak period	1,530	2025
TOTALS				**47,940**	

Figure 5-3
I-95 Corridor Bus Trip Volumes

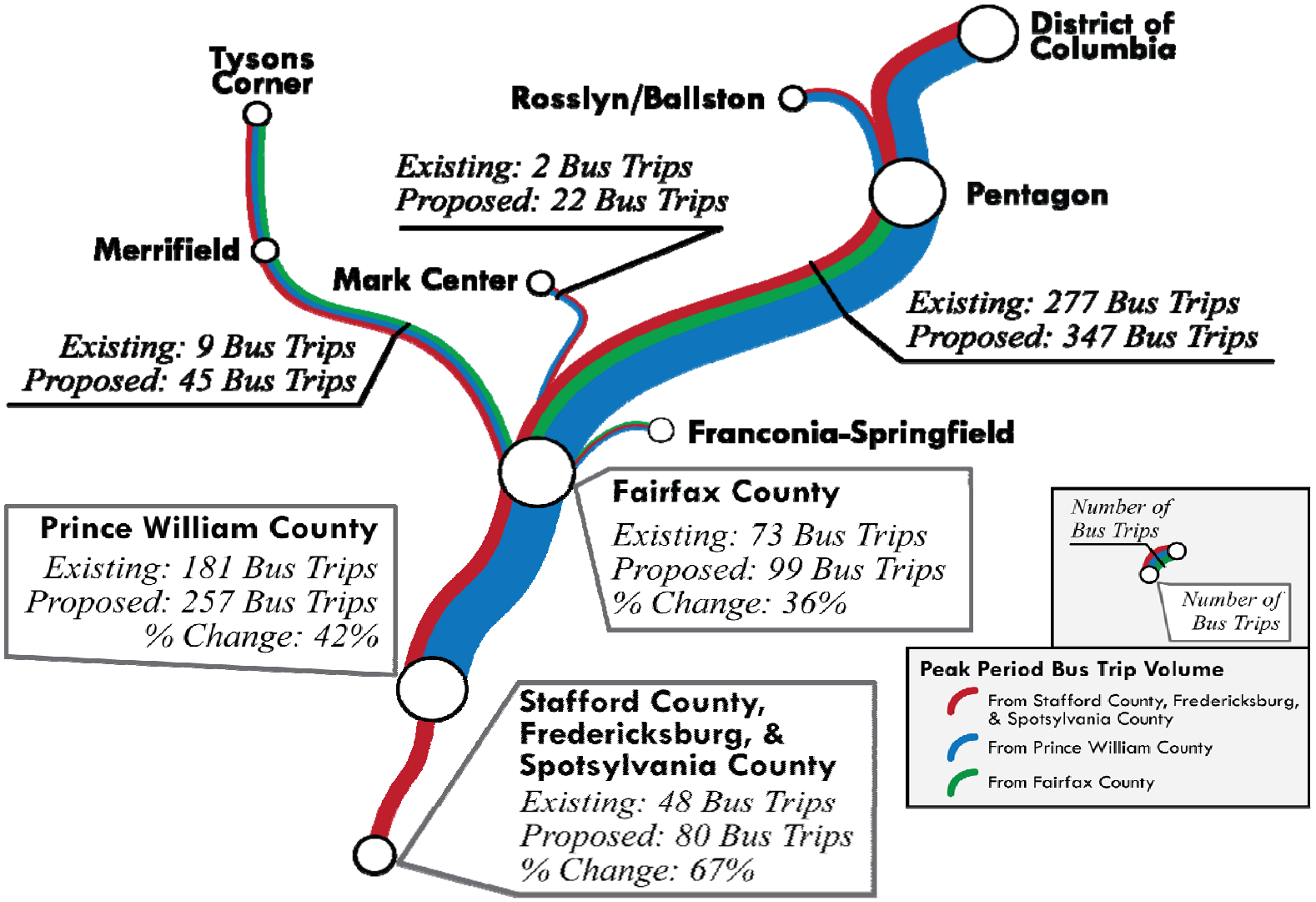


Table 5-3
Increase in Commuter Bus Trips by County of Origin

Commuter Trip Origins:	AM Peak Period Trips			PM Peak Period Trips		
	Existing	Proposed	% Change	Existing	Proposed	% Change
Stafford/Spotsylvania Counties	24	40	67%	24	40	67%
Prince William County	82	118	44%	99	139	40%
Fairfax County	33	46	39%	40	53	33%
Total	**139**	**204**	**47%**	**163**	**232**	**42%**

Notes:

Fairfax Connector proposed trips Include I-495 Tysons Express Routes

Prince William County trips include MetoDirect service to Franconia-Springfield

Table 5-4
Increase in Commuter Bus Trips by Destination

Commuter Trip Destinations:	AM Peak Period Trips			PM Peak Period Trips		
	Existing	Proposed	% Change	Existing	Proposed	% Change
Central D.C. Area	127	160	26%	150	187	25%
Mark Center	1	11	1000%	1	11	1000%
Tysons	4	22	450%	5	23	360%
Other	7	11	57%	7	11	57%
Total	**139**	**204**	**47%**	**163**	**232**	**42%**

Notes:

Destinations included in "Other" are: Fort Belvoir, Franconia-Springfield

Capacity contraints at Pentagon may necessitate the need for commuter trips to be routed to other destinations, such as Franconia-Springfield

Figure 5-4
Net Annual O&M Costs for Bus Service Recommendations by Five-Year Increment (2011 dollars)

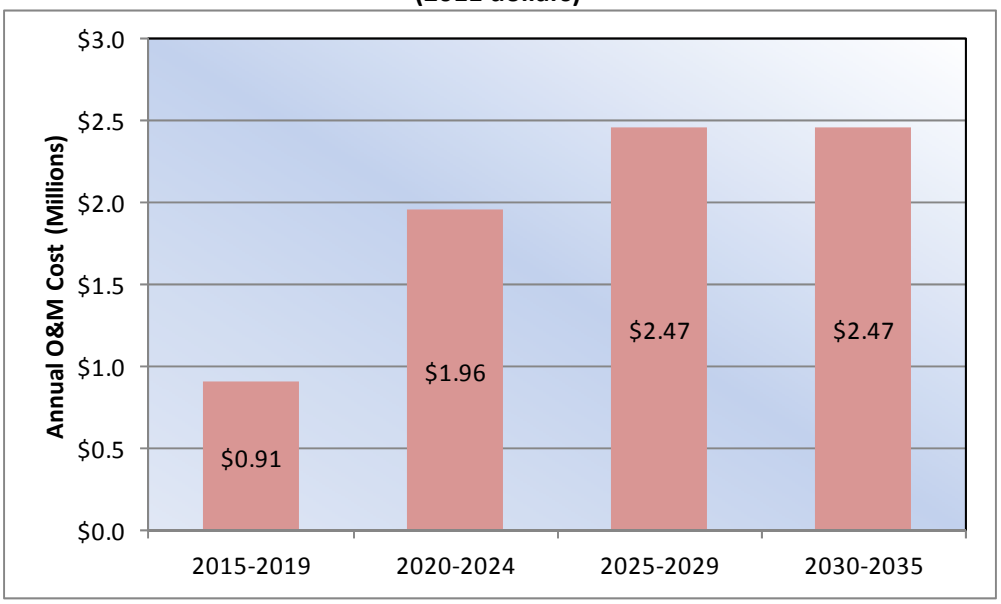


Table 5-5
Bus Service Expansion Recommendations – O&M Cost Estimates (2011 dollars)

Geographic Area	Imrpr. Status	Operator	Improvement Description	Annual O&M Cost	Potential Farebox	Net O&M Cost	Impl. Year	Total O&M thru 2035	Farebox thru 2035	Net Costs thru 2035
Fairfax	Committed Service	Fairfax	I-495 HOT Lane Service - Lorton-Tysons	Service Plans currently under development			< 2015		Committed Project	
County	Improvements	Fairfax	I-495 HOT Lane Service - Franconia/Springfield-Tysons	Service Plans currently under development			< 2015		Committed Project	
	Additional	Fairfax	Restructure Tysons service to stop at Saratoga pnr	$92,000	$28,000	$64,000	2015	$1,840,000	$560,000	$1,280,000
	Service Needs	Fairfax or	New: Saratoga-Pentagon Express - 5 a.m. and 5 p.m. trips	$230,000	$69,000	$161,000	2015	$4,600,000	$1,380,000	$3,220,000
	SubTotal			***$322,000***	***$97,000***	***$225,000***		***$6,440,000***	***$1,940,000***	***$4,500,000***
Prince William	Committed Service	OmniRide	Permanently operate additional OmniRide trips that were recently	$505,000	$227,000	$278,000	2015	$10,100,000	$4,540,000	$5,560,000
County	Improvements		implementd to address overcrowding issues							
	Additional	OmniRide	Lake-Ridge-Washington, D.C. - add 3 a.m. and 4 pm. trips	$321,000	$144,000	$177,000	2025	$3,210,000	$1,440,000	$1,770,000
	I-95 Corridor	OmniRide	Lake Ridge-Pentagon/Crystal City - add 3 a.m. and 3 p.m. trips	$275,000	$124,000	$151,000	2025	$2,750,000	$1,240,000	$1,510,000
	Service Needs	OmniRide	New Service - Lake Ridge to Mark Center - 4 a.m. and 4 p.m. trips	$367,000	$165,000	$202,000	2015	$7,340,000	$3,300,000	$4,040,000
		OmniRide	Dale City/Potomac Mills-Washington, D.C. - add 4 a.m. and 5 p.m. trips	$413,000	$186,000	$227,000	2020	$6,195,000	$2,790,000	$3,405,000
		OmniRide	Dale City/Potomac Mills-Pentagon/Crystal City - add 3 a.m. and 4 p.m. trips	$321,000	$144,000	$177,000	2025	$3,210,000	$1,440,000	$1,770,000
		OmniRide	Dale City/Potomac Mills-Rosslyn/Balston - add 2 a.m. and 2 p.m. trips	$184,000	$83,000	$101,000	2020	$2,760,000	$1,245,000	$1,515,000
		OmniRide	New Service: Dale City/Potomac Mills-Mark Center - 4 a.m. and 4 p.m. trips	$367,000	$165,000	$202,000	2015	$7,340,000	$3,300,000	$4,040,000
		OmniRide	New Service: Dale City/Potomac Mills-Merrifield - 4 a.m. and 4 p.m. trips	$367,000	$165,000	$202,000	2020	$5,505,000	$2,475,000	$3,030,000
		OmniRide	Monclair/Dumfries-Pentagon/DC - Add 2 a.m. and 3 p.m. trips	$230,000	$104,000	$126,000	2020	$3,450,000	$1,560,000	$1,890,000
		OmniRide	New Service: Montclair/Dumfries-Tysons Corner - 4 a.m. and 4 p.m. trips	$367,000	$165,000	$202,000	2020	$5,505,000	$2,475,000	$3,030,000
		MetroDirect	Prince William MetroDirect - Increase peak period frequencies to 20-min.	$245,000	$49,000	$196,000	2020	$3,675,000	$735,000	$2,940,000
	SubTotal			***$3,962,000***	***$1,721,000***	***$2,241,000***		***$61,040,000***	***$26,540,000***	***$34,500,000***
Stafford and	Additional	Private Op's.	Washington D.C. Service - add 6 trips each peak period	$551,000	$551,000	$0	2020	$8,265,000	$8,265,000	$0
Spotsylvania	I-95 Corridor	Private Op's.	Pentagon/Crystal City Service - add 2 trips each peak period	$184,000	$184,000	$0	2020	$2,760,000	$2,760,000	$0
Counties	Service Needs	Private Op's.	Mark Center Service - add 2 trips each peak period	$184,000	$184,000	$0	2020	$2,760,000	$2,760,000	$0
		Private Op's.	Navy Yard/DOT Service - add 1 trip each peak period	$92,000	$92,000	$0	2025	$920,000	$920,000	$0
		Private Op's.	Rosslyn Service - add 2 trips each peak period	$184,000	$184,000	$0	2025	$1,840,000	$1,840,000	$0
		Private Op's.	Fort Belvoir Service - add 1 trip each peak period	$92,000	$92,000	$0	2015	$1,840,000	$1,840,000	$0
		Private Op's.	Tysons Corner Service - new service, 2 trips each peak period	$184,000	$184,000	$0	2025	$1,840,000	$1,840,000	$0
	SubTotal			***$1,471,000***	***$1,471,000***	***$0***		***$20,225,000***	***$20,225,000***	***$0***
TOTALS				**$5,755,000**	**$3,289,000**	**$2,466,000**		**$87,705,000**	**$48,705,000**	**$39,000,000**

Notes:

1. *Costs in 2011 dollars*
2. *Costs based on a cost per revenue hour assumption of $120*
3. *Assumed farebox recovery ratios for each operator are as follows:*
   - *a. Local routes 20% Assuming 20% farebox recovery/80% subsidy*
   - *b. Fairfax express 30% Assuming 30% farebox recovery/70% subsidy*
   - *c. PRTC 45% Consistent with PRTC TDP assumptions*
   - *d. Stafford/Spotsy 100% Assumes 100% recovery under private operations*

5.3 TDM Program Recommendations

As discussed in *Technical Memorandum #2*, the TDM needs from the prior *I-95/I-395 Transit and TDM Study* have been revisited and refined in light of new programs, updated plans for existing programs and discussions with corridor TDM staff. The identified TDM needs can be categorized as follows:

- Vanpool Program Assistance
  - VanStart/VanSave
  - Vanpool Insurance
  - NTD Program
- Telework Program Assistance
- I-95 Corridor Marketing/Education
  - Annual Marketing Campaigns
  - HOT/HOV Start-up Campaigns
- TDM Program Staffing
- Technology Upgrades
- Supporting Programs
  - Guaranteed Ride Home
  - Incentive Programs

Currently, Transportation Efficiency Improvement Fund (TEIF) monies are utilized to fund the local TDM programs. No additional funding is available to implement these recommendations. The TDM recommendations detailed in T*echnical Memorandum #2* will be implemented to the extent possible using any unobligated TEIF funds that remain at the end of each fiscal year or any other funding that becomes available. Since available funding will vary from year to year, it is not possible to determine the timeframe or extent of implementation of these recommendations.

5.4 Destination-End Facility Recommendations

As discussed in T*echnical Memorandum #2*, it is important not to lose sight of potential infrastructure impacts and needs at I-95 commuter trip destinations both south and north of I-495. Within the I-95 corridor, the assessment revealed the destination-end facility needs as summarized below.

Mark Center

Although technically not within the I-95 Corridor, this facility has been included because it is located just north of the defined corridor, and is anticipated to be a major travel destination for trips from the corridor. As noted in *Technical Memorandum #1*, actions taken through the 2005 BRAC Act are resulting in 6,400 additional military personnel at the Mark Center. A Transportation Management Plan was prepared that includes actions intended to reduce single occupant vehicle trips to/from the Mark Center. To encourage transit usage, a transit center has been constructed within the Mark Center that includes five bus bays. WMATA and DASH already have service in place to/from the Mark Center (discussed in *Technical Memorandum #2*). Potential service expansion plans presented in this study will increase commuter bus trips to/from the Mark Center, with those bus trips being able to utilize the planned I-95 HOV ramp to/from Seminary Road. A review of proposed bus service levels, and discussion with agency staff indicate that there should be sufficient capacity to accommodate commuter bus

service expansion, as proposed in this study. However, there is little room for further expansion of bus service, and bus operations at the transit center will need to be carefully managed.

Franconia-Springfield Metrorail Station

There are presently eight bays at Franconia-Springfield Metrorail station, with these bays utilized by Metrobus, Fairfax Connector and PRTC. The DoD will also be operating shuttle service from this station to the Mark Center and Fort Belvoir North. WMATA staff is presently in the planning process for adding two or three bays at this station through a Transportation Investment Generating Economic Recovery (TIGER) Grant. Potential service expansion plans presented in this study will increase PRTC Metro Direct trips and possibly commuter bus trips to/from this station. A review of proposed bus service levels indicate that there should be sufficient capacity to accommodate bus service expansion at this station, as proposed in this study. However, coordination will still be needed in the assignment of bus service to bus bays at this station, as there are also planned service increases at this station by the Fairfax Connector and by DoD shuttles.

There are also over 5,100 on-site parking spaces that are fully-utilized. There are no travel demand forecasts available to determine potential additional parking demands at this station. However, concern has been expressed by stakeholders about potential increased demands from Single Occupant Vehicle (SOV) commuters that might exit the HOT lanes on I-95 and complete their trip via the Blue Line (since the HOT lanes will end north of I-495 and there is a reduction from three to two HOV lanes). To address this need, a strategy has been identified to expand off-site parking and provide shuttle service between the off-site parking and the Franconia-Springfield Station. For purposes of this study, 750 off-site spaces have been assumed as structured parking. Specific demand will need to be determined through further analysis with the regional travel demand model. **Table 5-6** presents estimated costs (capital and O&M) associated with this strategy. As was noted for the non-rail park-and-ride space recommendations, it is important that there be flexibility for local jurisdictions and VDOT to work together to identify an appropriate location for these proposed off-site spaces. These spaces could be combined with other park-and-ride space recommendations presented earlier in this Report. Shuttle bus service for the off-site parking must also be coordinated with existing local bus service in the Springfield area.

Costs for the proposed 750 off-site parking spaces total $22.5 million, based on a typical unit cost of $30,000 per structured parking space. This would be a one-time capital cost with implementation assumed in 2020 (ideally coordinated with completion of the I-95 HOT/HOV lane project into Spotsylvania County). Note that this cost estimate does not include annual maintenance costs of the parking structure. Shuttle service would be implemented once the new off-site parking facility is opened, and has been estimated at an annual cost of $551,000. Three buses are proposed for the service (2 in operation, one spare), adding an additional capital cost of $1.35 million. Thus, the total cost of the parking expansion and shuttle service from 2020 through 2035 would be $32.115 million.

Table 5-6
Franconia-Springfield Off-Site Parking Recommendations – Estimated Costs (in 2011 dollars)

Location	Improvement Description	Impl. Year	Project Cost
Franconia-Springfield Metrorail	Add off-site parking - 750 spaces	2020	$22,500,000
	Shuttle Service to off-site parking (2 vehicles, 9 hours/day - 255 days/year)	Annual cost Cost thru 2035	$551,000 $8,265,000
	Shuttle Buses - 3 buses (2 peak/1 spare) @ $450,000 each	2020	$1,350,000
TOTALS			**$32,115,000**

Notes:

1. *Cost for off-site parking is based on $30,000 per parking space, reflecting a typical parking structure unit cost*
2. *Shuttle operation cost based on a unit cost of $120 per revenue hour.*

6.0 Summary of Plan Costs

This final section presents summaries of the costs detailed in the prior sections of this chapter. **Table 6-1** presents an overall plan summary matrix, breaking down the costs by plan element (i.e., capital costs, O&M costs, TDM costs and Franconia-Springfield Station costs). It further breaks down costs by funding commitment status. Costs presented in this table are for the plan's entire time period (through 2035).

Table 6-1
Summary of Estimated Costs for Plan Recommendations (2011 dollars)

Plan Element	Plan Cost
Capital Costs	
Current Funded Park & Ride Spaces	$22,800,000
Additional Park & Ride Spaces	$98,875,000
Bus Fleet Expansion	$23,400,000
O&M Costs (thru 2035)	$39,000,000
TDM Program Costs (thru 2035)	TBD
Franconia Springfield Station	
Off-Site Parking	$22,500,000
Off-Site Parking Shuttle Buses & O&M	$9,615,000
Total Costs	**$216,190,000**
Previoiusly Committed Funds:	***$22,800,000***
Recommended for Six-Year Program	***$193,390,000***

Table 6-2 focuses only on additional costs recommended for inclusion in the State's Six-Year Improvement Program by plan element and five-year increment for I-95 related costs. Total costs by plan element and by time period are also illustrated in **Figure 6-1** and **Figure 6-2.**

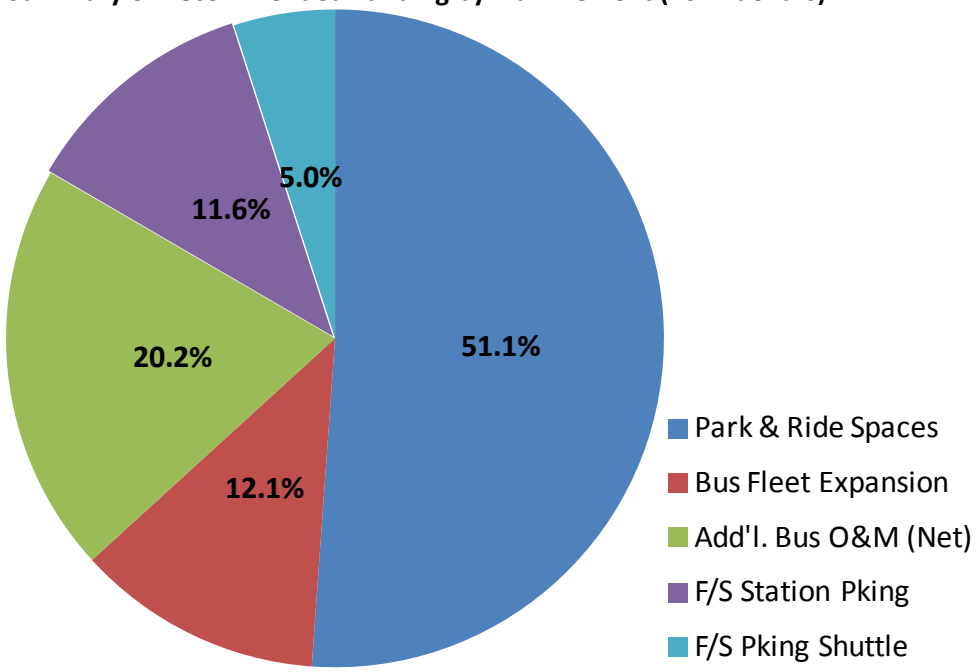
The total cost (capital and O&M) is estimated to be $193.39 million between 2015 and 2035. By time period, total costs increase significantly from the 2015-2019 period to the 2020-2024 period and then taper off somewhat in the last two time periods. The expansion of park and ride spaces along I-95 is by far the largest component of the recommendations, at $98.9 million (or 51%).

Table 6-2
Summary of Recommended Funding by Plan Element and Time Period (2011 dollars)

Plan Element	Time Period 2015-19	2020-24	2024-2029	2030-2035	TOTAL
Total Corridor Service/Project Needs					
Previously Funded P&R Spaces	$22,800,000	$0	$0	$0	$22,800,000
Additional P&R Spaces	$0	$35,875,000	$27,937,500	$35,062,500	$98,875,000
Bus Purchase Needs	$7,467,000	$10,596,000	$5,337,000	$0	$23,400,000
Add'l. Bus O&M (Net)	$4,535,000	$9,805,000	$12,330,000	$12,330,000	$39,000,000
TDM Programs	TBD	TBD	TBD	TBD	TBD
F-S Station Off-Site Parking	$0	$22,500,000	$0	$0	$22,500,000
F-S Station Parking/Shuttle & Buses	$0	$4,105,000	$2,755,000	$2,755,000	$9,615,000
Total (Funded and Recommended)	**$34,802,000**	**$82,881,000**	**$48,359,500**	**$50,147,500**	**$216,190,000**
Total for Six-Year Program:	**$12,002,000**	**$82,881,000**	**$48,359,500**	**$50,147,500**	**$193,390,000**

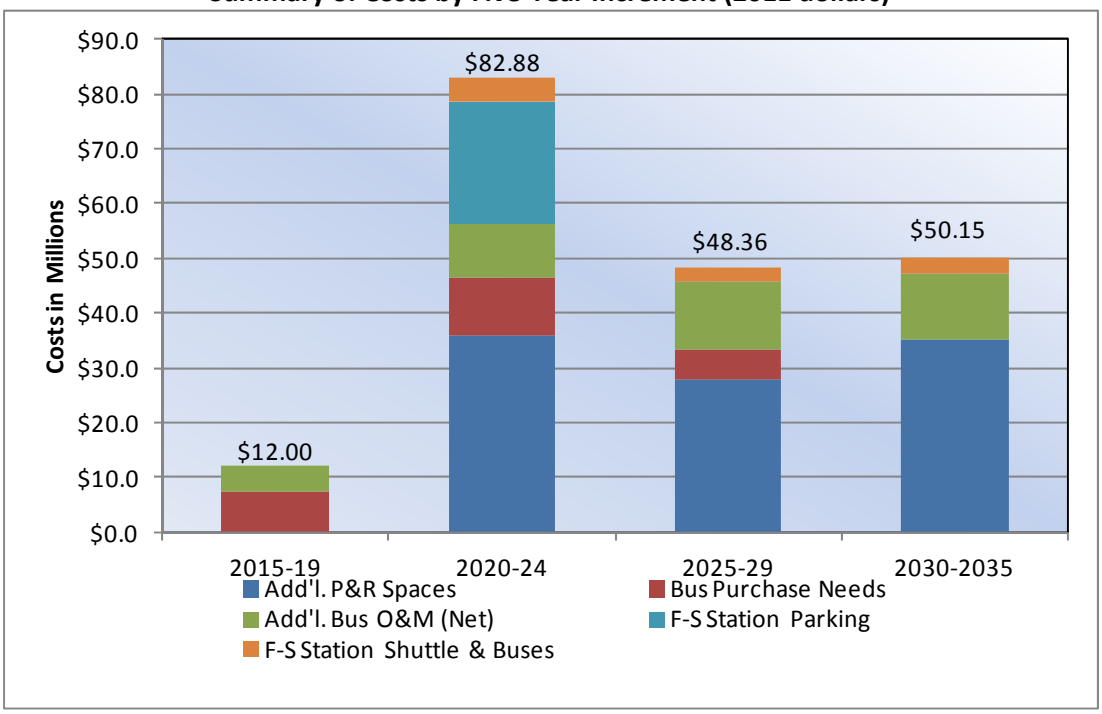
TDM Costs/Funding Needs to be determined.

Figure 6-1
Summary of Recommended Funding by Plan Element (2011 dollars)



TDM Costs/Funding Needs not included in above graph.

Figure 6-2
Summary of Costs by Five-Year Increment (2011 dollars)



TDM Costs/Funding Needs not included in above graph.

I-95 Corridor
Transit and TDM Plan

Technical Memorandum #1:
Existing Service Characteristics

FINAL

Prepared for:

DRPT
Virginia Department of Rail and Public Transportation

Prepared by:

ATKINS

CTG Connetics Transportation Group

November 22, 2011

Table of Contents

Table of Contents (Continued)

1.0 Introduction

Virginia is addressing critical transportation needs for the I-95 Corridor. Through a concurrent package of improvements, the Commonwealth will deliver congestion relief, enhance transit and provide new choices on I-95. These concurrent efforts related to the overall strategy to enhance travel and safety are listed below.

1. I-95 HOT/HOV Lanes
2. VDOT Seminary HOV/Transit ramp
3. Transit Improvements

The *I-95 Corridor Transit and TDM Plan* is being developed to provide the Commonwealth of Virginia with recommendations for transit and Transportation Demand Management (TDM), including both operations and capital investments, to complement the I-95 HOT/HOV Lanes improvements. It pivots off of the 2008 DRPT *I-95/I-395 Transit/TDM Study*. This plan is being developed with the intent of maximizing utilization of the HOT/HOV lanes network and responding to the demand for increased public transportation and ridesharing.

The *I-95 Transit and TDM Plan* is being developed in collaboration with the Secretary of Transportation and the Virginia PPTA (Public-Private Transportation Act) Office. A multi-jurisdictional Stakeholder Group was formed early in the study process to provide technical input into the study, with meetings at three key points during the course of the study.

This first Technical Memorandum presents an analysis of existing service characteristics and transit, parking and TDM program needs for the I-95 corridor. Specifically, it addresses:

- A description of the current I-95 HOT/HOV lane project;
- Demographic characteristics and trends in the corridor;
- Existing and future travel pattern characteristics;
- Descriptions of existing transit services in the I-95 corridor (Fairfax Connector, WMATA, PRTC, FRED, Quick's, Martz and VRE);
- Corridor park-and-ride lot locations and utilization;
- TDM programs provided in the corridor; and
- Anticipated transit, parking and TDM program needs.

2.0 I-95 HOT/HOV Lane Project Definition

The Virginia Department of Transportation (VDOT) is advancing a new I-95 High Occupancy Vehicle/High Occupancy Toll (HOT/HOV) Lanes project to provide additional HOV and HOT capacity in the corridor and to create a seamless network for travelers along I-95 and I-495. In 2005, VDOT entered into an agreement with Fluor-Transurban to develop a HOV/Bus/HOT lanes system along I-395 and I-95 from the Pentagon area in Arlington County to Spotsylvania County. The project was delayed and VDOT has since decided to move forward with a redefined project. The new I-95 HOT/HOV Lanes project will create continuous HOT/HOV lanes on I-95 from the vicinity of Edsall Road on I-395 in Fairfax County to just south of US 17 (Mills Drive, south of Fredericksburg) in Spotsylvania County.

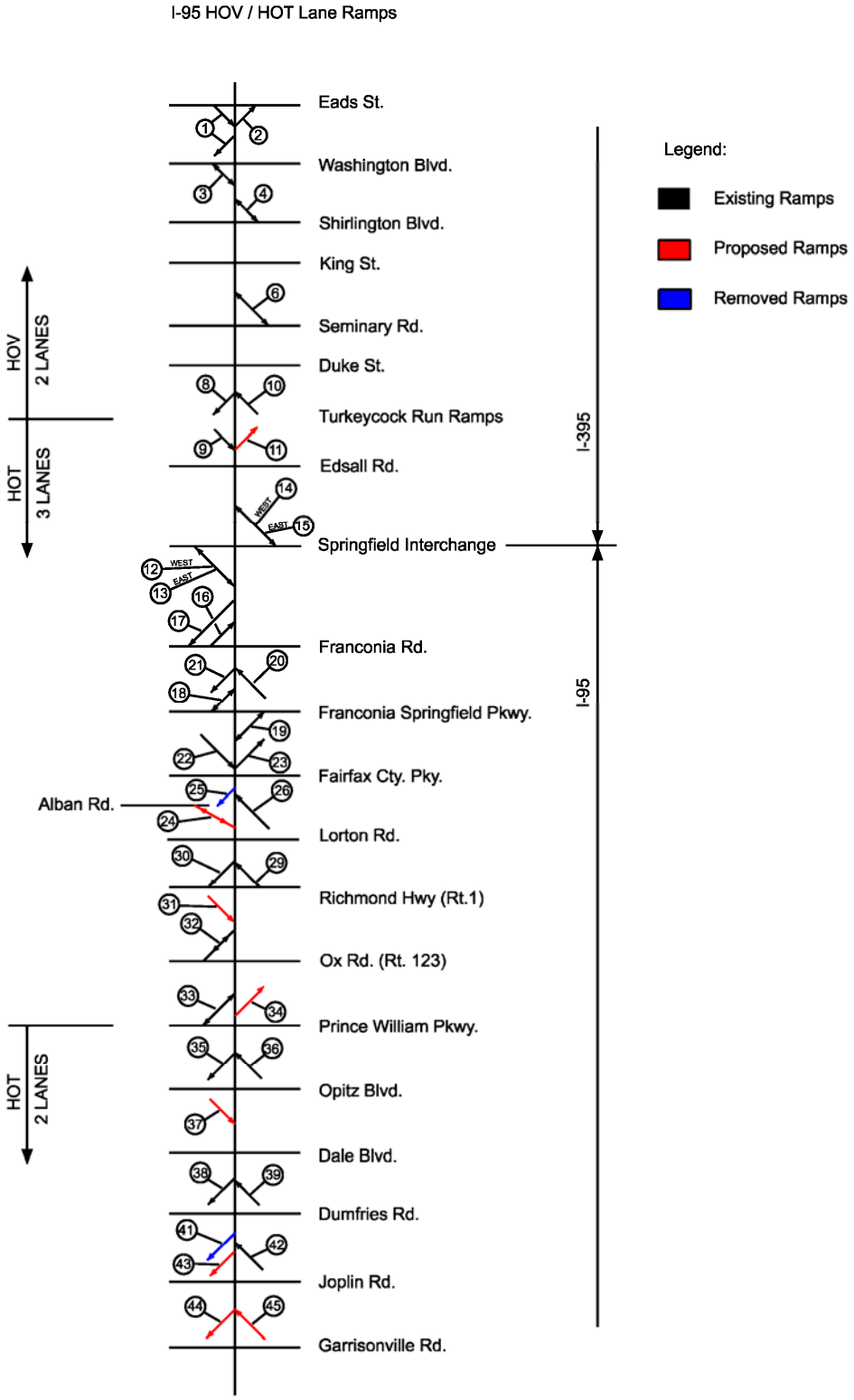
The portion of the project that is to be completed by 2015 will include the following:

- Constructing two new reversible HOT/HOV lanes for nine miles from Route 610/Garrisonville in Stafford County to Route 234 in Dumfries, where the existing HOV lanes begin
- Widening of the existing HOV lanes from two to three lanes for 14 miles from Prince William Parkway to approximately two-miles north of the Springfield Interchange, in the vicinity of Edsall Road
- Improvements to the existing two HOV lanes for six miles from Route 234 to the Prince William Parkway
- New or improved access points between the HOT/HOV lanes and the general purpose lanes
- New access between the HOT/HOV lanes and Fairfax County Parkway (at Boudinot Road)

Access points between HOT/HOV lanes and general purpose lanes are illustrated in **Figure 2-1** (schematic provided by VDOT). This project will create the following new access points:

- For southbound traffic, new flyover ramp access from HOT/HOV lanes to general purpose (GP) lanes between Joplin Road and Garrisonville Road
- For northbound traffic, new access from GP lanes to HOT/HOV lanes between Garrisonville Road and Joplin Road
- Removal of existing southbound access from HOV lanes to general purpose lanes south of Dumfries Road, and constructing a new flyover access ramp further south
- For southbound traffic, new access from GP lanes to HOT/HOV lanes south of Opitz Blvd.
- For northbound traffic, access from HOT/HOV lanes to GP lanes north of Prince William Pkwy
- For southbound traffic, new ramp access from GP lanes to HOT/HOV lanes south of Richmond Hwy (Route 1)
- For northbound traffic, flyover ramp access from HOT/HOV lanes to Boudinot Drive in the a.m. In the p.m., traffic flows are reversed, providing access from Boudinot Drive to southbound HOT/HOV lanes
- For northbound traffic, new flyover ramp access from HOT/HOV lanes to GP lanes north of Edsall Road

Figure 2-1
HOT/HOV Lane Access Schematic



Carpools with three or more people, vanpools and transit vehicles will have free access to the HOT/HOV Lanes network. The estimated cost of Phase 1 is $1 billion, and is being financed, constructed and operated under Virginia's Public-Private Transportation Act.

The HOT/HOV lanes are to eventually be extended south to Spotsylvania County, with construction completed in 2018. Two new HOT/HOV lanes are to be constructed in the median of I-95 from Route 610/Garrisonville to US 17 (the Massaponax exit) in Spotsylvania County. Access ramps between HOT/HOV Lanes and general purpose lanes will generally be provided between each interchange.

Dynamic tolling will be used to adjust HOT lane tolls based on real time traffic conditions, video technology to identify accidents, a series of electronic signs to communicate with drivers and state troopers to ensure enforcement. These strategies are to maintain travel speeds, make travel times more predictable and significantly reduce violators.

VDOT is also proceeding with a separate project. A new HOV ramp is to be constructed at the Mark Center at I-395 and Seminary Road. This ramp will provide access to the third level of the I-395/ Seminary Road interchange. Access to the third level will provide HOVs and buses with more direct access to the Mark Center via Seminary Road and Mark Center Drive. This project is to be completed by 2015 at an estimated cost of $80 million. This project will complement other short and mid-term improvements to the arterial street network that are to be implemented in conjunction with the BRAC 133 project at the Mark Center.

3.0 Demographic Characteristics and Trends

The I-95 corridor is approximately 56-miles in length, from US 1 and I-95 near Massaponax in the south to the Potomac River in the north. The I-95 HOT/HOV lane project traverses Spotsylvania, Stafford, Prince William and Fairfax Counties. For purposes of documenting demographic trends, Arlington County and the City of Alexandria have been included. Demographic characteristics were determined for an area approximately 5-10 miles on either side of I-95 and I-395. For the purpose of this analysis, the study area is split into two sections:

- Northern Corridor, including Prince William, Fairfax, and Arlington Counties. The Northern Corridor is shown in **Figure 3-1**.
- Southern Corridor, including Spotsylvania and Stafford Counties. The Southern Corridor is shown in **Figure 3-2**.

3.1 Demographic Characteristics and Trends

The Metropolitan Washington Council of Governments (MWCOG) and Fredericksburg Area Metropolitan Planning Organization (FAMPO) regional travel demand forecast models were used for determining existing and future demographic characteristics. Population and employment characteristics were determined for the years 2011, 2015 and 2035. Demographic data for the northern portion of the corridor was obtained from the MWCOG, used in the approved 2010 Constrained Long Range Transportation Plan, Version 2.2, Round 8. Demographic data files were provided by MWCOG for the years 2011, 2020, 2030 and 2040. Estimates for 2015 and 2035 were developed through interpolation of the MWCOG databases. Demographic data for the southern portion of the corridor was obtained from the FAMPO data used in the FAMPO 2035 Long-Range Transportation Plan. Demographic data files were provided by FAMPO for the years 2006, 2009, 2015, 2025 and 2035. Estimates for 2011 were developed through interpolation of the 2009 and 2015 databases.

This section summarizes population and employment projections for the entire study area comprised of the Northern and Southern Corridors. Data on the figures included in this section are presented at the traffic analysis zone level (TAZs).

Figure 3-1: Northern Study Corridor

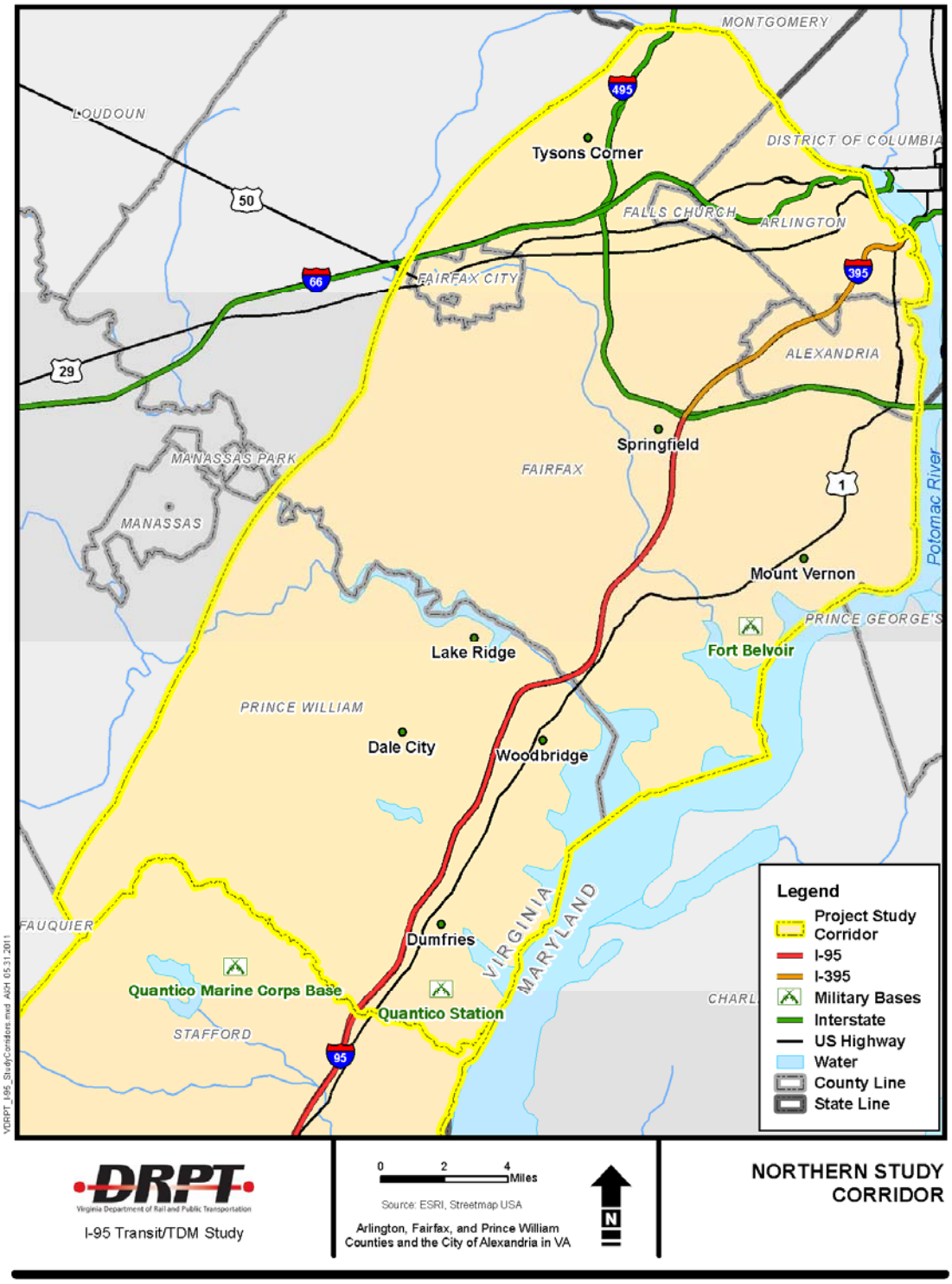
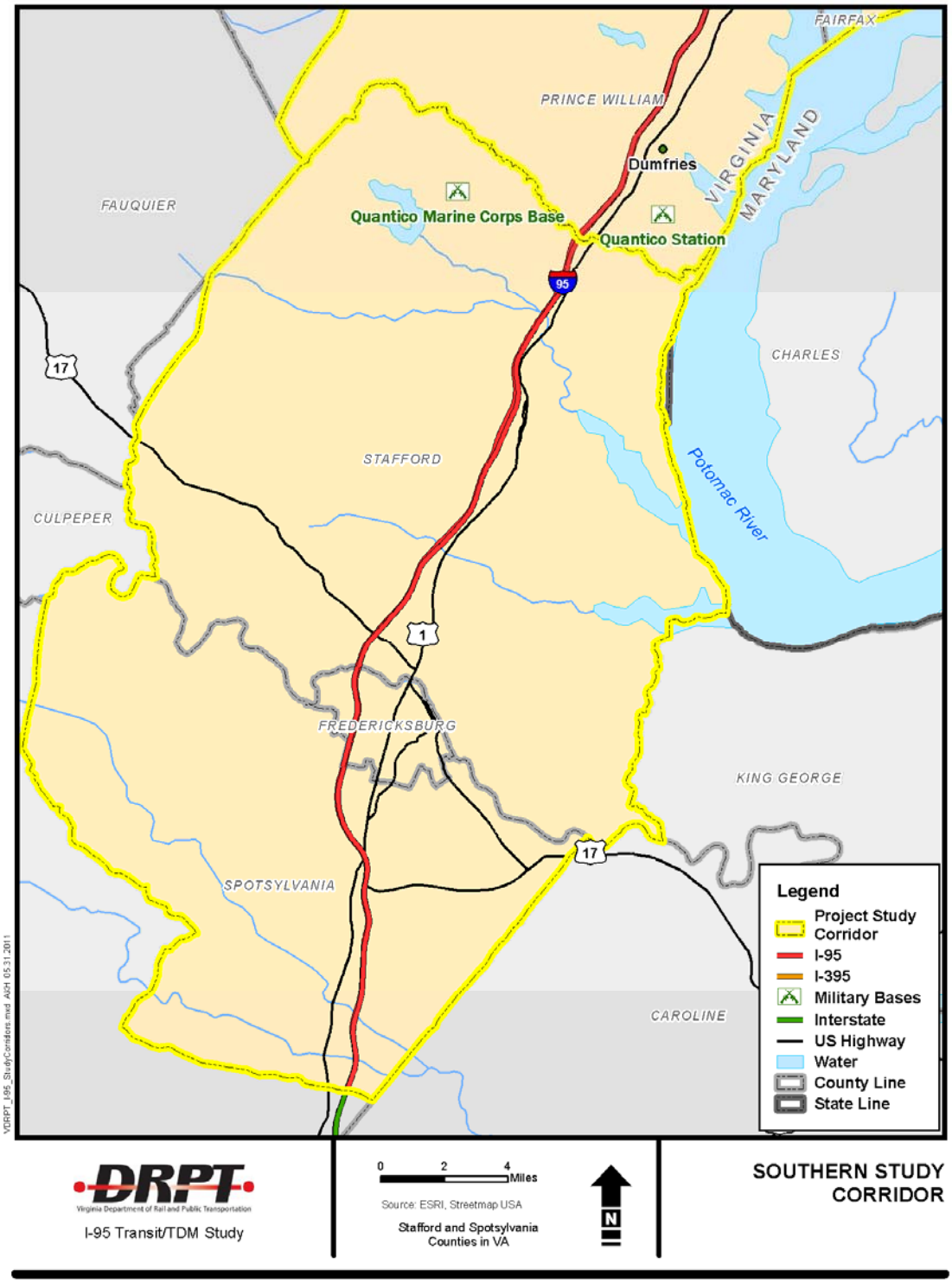


Figure 3-2: Southern Study Corridor



3.1.1 Study Area Population and Employment Forecast

As shown in **Table 3-1**, the estimated 2011 population in the study area is 1.7 million. Estimated employment is 1 million. By 2015, the projected population increases to 1.8 million and employment increases to 1.1 million. By 2035, the population will increase to 2.2 million and employment will increase to 1.3 million.

Table 3-1: Projected Population and Employment in the Study Area (2011, 2015, and 2035)

Population	2011	2015	2035
Northern Corridor	1,424,204	1,488,631	1,683,079
Southern Corridor	306,820	341,206	509,056
Total	1,731,024	1,829,837	2,192,135
% Change from 2011	n/a	5.71%	26.64%
Employment	**2011**	**2015**	**2035**
Northern Corridor	900,535	967,317	1,159,685
Southern Corridor	118,343	130,049	182,530
Total	1,018,877	1,097,366	1,342,215
% Change from 2011	n/a	7.70%	31.73%

Source: MWCOG, FAMPO

The majority of residents and employment will continue to be concentrated in the Northern Corridor, with a slight shift to Southern Corridor between today and 2035. As shown in **Table 3-2**, in 2011, the Northern Corridor accounts for 82.3 percent of population in the study area, but is expected to decrease to 76.8 by 2035. Northern Corridor employment accounts for 88.4 percent of all jobs, but is expected to decrease to 86.4 percent by 2035.

Table 3-2: Projected Population and Employment in the Study Area as Percentage of Total (2011, 2015, and 2035)

Population	2011	2015	2035
Northern Corridor	82%	81%	77%
Southern Corridor	18%	19%	23%
Total	100%	100%	100%
Employment	**2011**	**2015**	**2035**
Northern Corridor	88%	88%	86%
Southern Corridor	12%	12%	14%
Total	100%	100%	100%

Source: MWCOG, FAMPO

As noted above, corridor employment is anticipated to grow at a faster rate than corridor population. Depending on the location of employment, this may help reduce commuter trip distances. However,

the data presented in this Tech Memo suggests that long-distance commuter trips will continue to be predominant in the I-95 corridor for the foreseeable future, and that additional commuter transit services and facilities will be needed to accommodate these trips. A significant change in land use practices and policies would be needed to alter home-to-work trip characteristics in this corridor.

Population and employment characteristics of the Northern and Southern Corridors are described in more detail in the following sections.

3.2 Northern Corridor Characteristics (Fairfax and Prince William Counties)

3.2.1 Population Density

Figures 3-3 through **3-5** illustrate population density along the Northern Corridor in 2011, 2015, and 2035. Arlington County, the City of Alexandria, and areas near Washington, D.C. have the highest population density, with more than 10,000 residents per sq. mile. By 2035, population density in parts of Woodbridge, Dale City, and Lake Ridge in Prince William County is projected to increase dramatically. TAZs in close proximity to the I-95 corridor are among those showing the greatest increases in population density.

3.2.2 Annual Population Growth

Figures 3-6 and **3-7** show the projected annual population growth. **Figure 3-6** shows that the high growth areas between 2011 and 2015 will be located along I-95 in Prince William County, particularly in Woodbridge and Dale City, both with annual population growth of four percent or more. In Fairfax County, Lorton and Fort Belvoir are projected to experience the highest population growth. Tysons Corner, targeted for high density, mixed-use redevelopment, is another high population growth location in Fairfax County. Not all areas in the Northern Corridor will continue to experience a population boom. Parts of Arlington County, zones in the City of Alexandria, and some rural zones in Fairfax County will not experience significant population gains on par with the above mentioned areas in the 2011-2015 period (although the areas around U.S. 1 in Alexandria are projected to experience high population growth).

The annual population growth from 2015 to 2035, while still relatively high, is projected to level off in many areas projected to experience high population growth between 2011 and 2015. As shown in **Figure 3-7**, the areas expected to continue growing at a very high rate of annual population growth (four percent or more) include areas along I-95 in Fairfax and Prince William Counties (particularly Springfield, Lorton, and Fort Belvoir in Fairfax County and Woodbridge, Dale City, and Lake Ridge in Prince William County). In the I-495 Beltline area, Tysons Corner is projected to continue to attract new residents at an annual growth rate of four percent or more.

Figure 3-3: 2011 Population Density - Northern Corridor

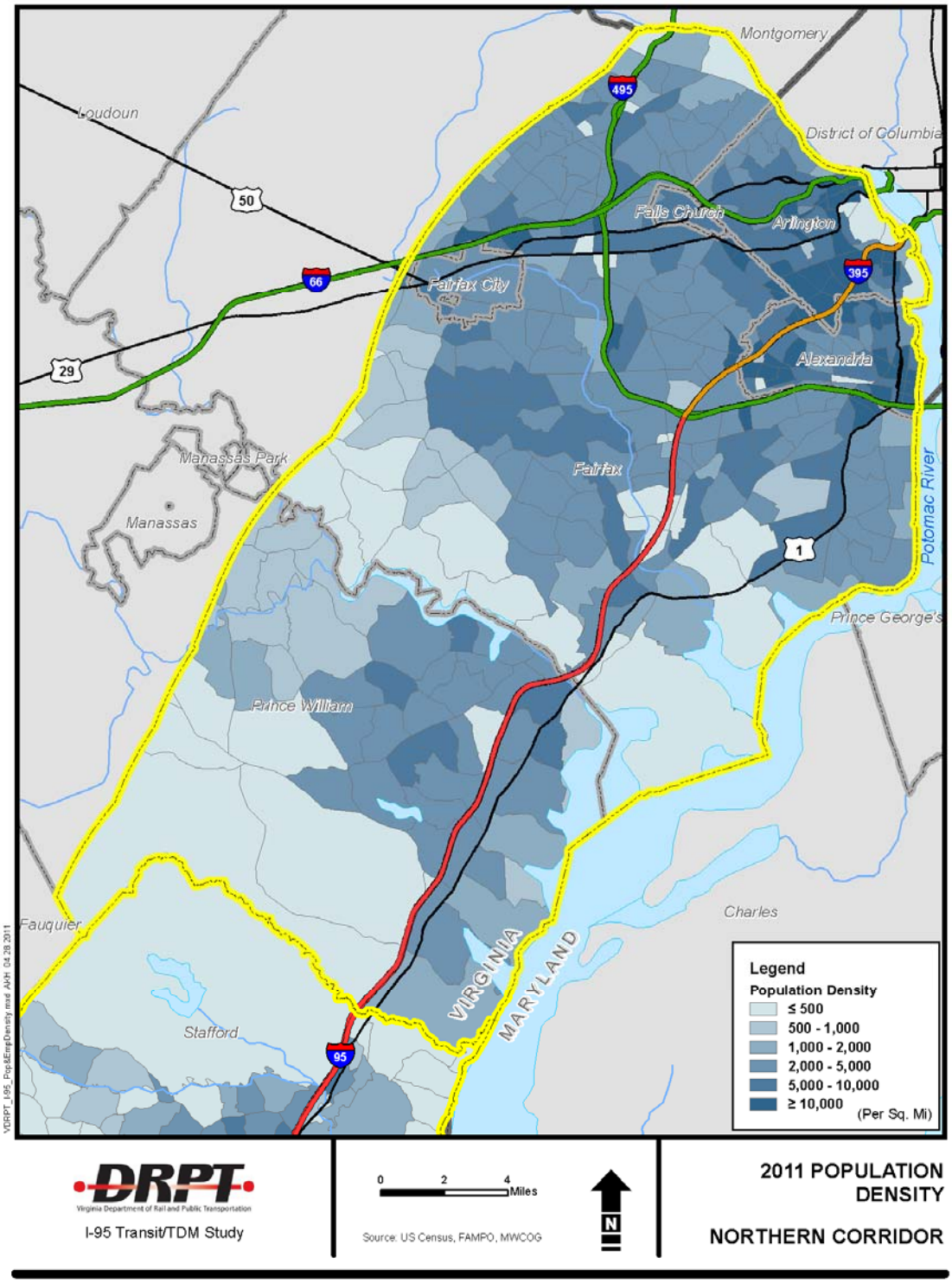


Figure 3-4: 2015 Population Density - Northern Corridor

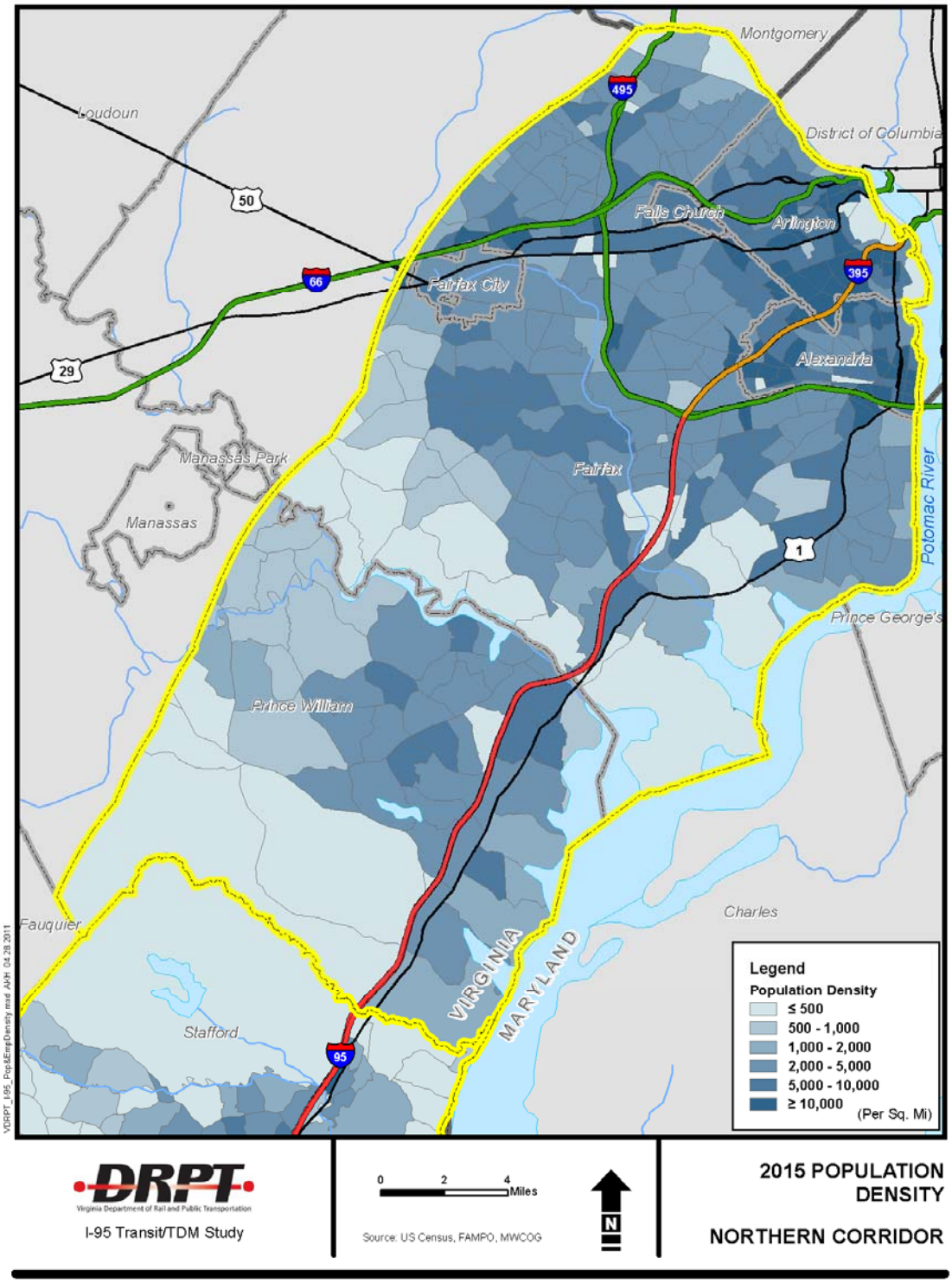


Figure 3-5: 2035 Population Density - Northern Corridor

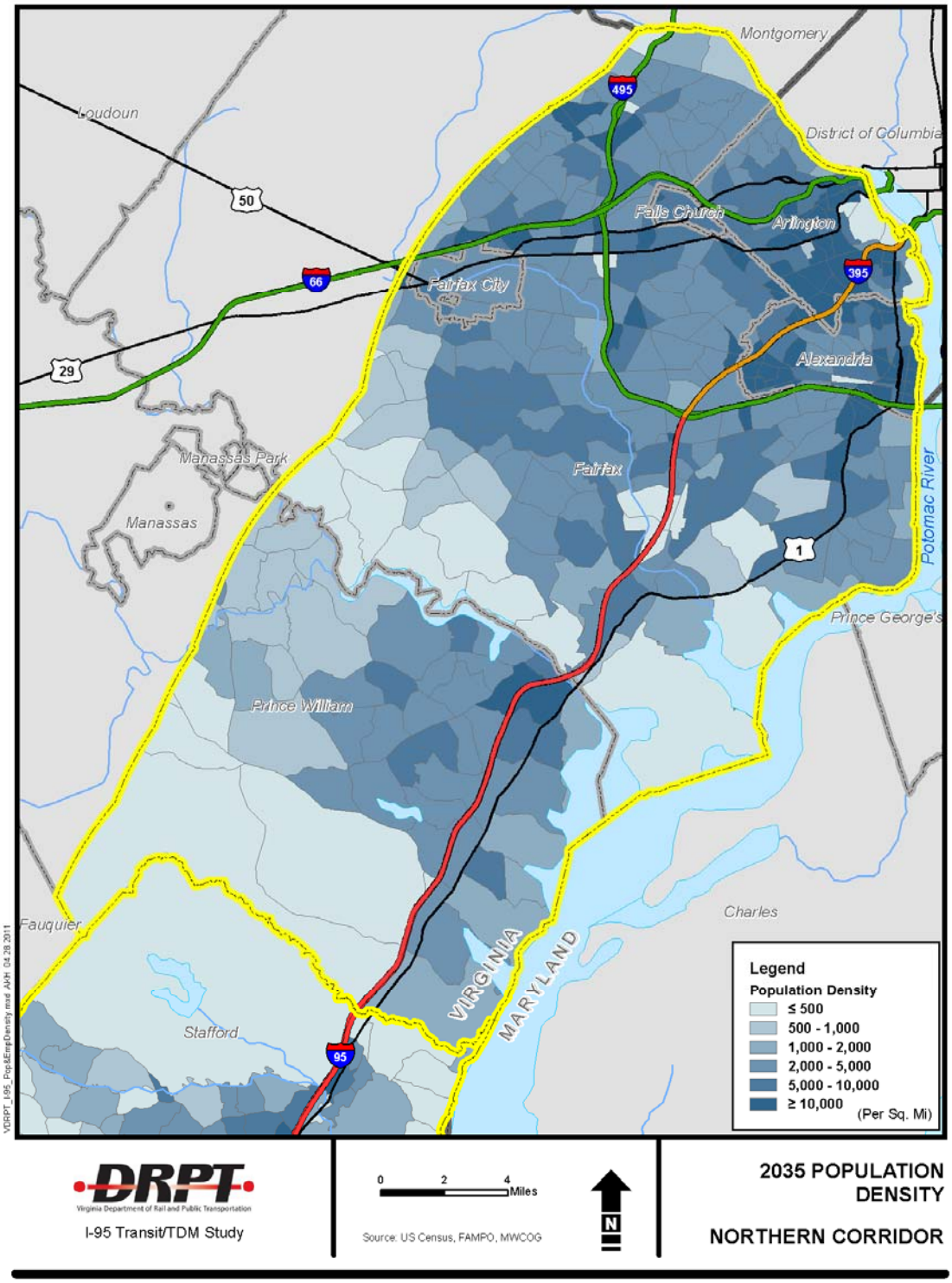


Figure 3-6: 2011-2015 Annual Population Growth - Northern Corridor

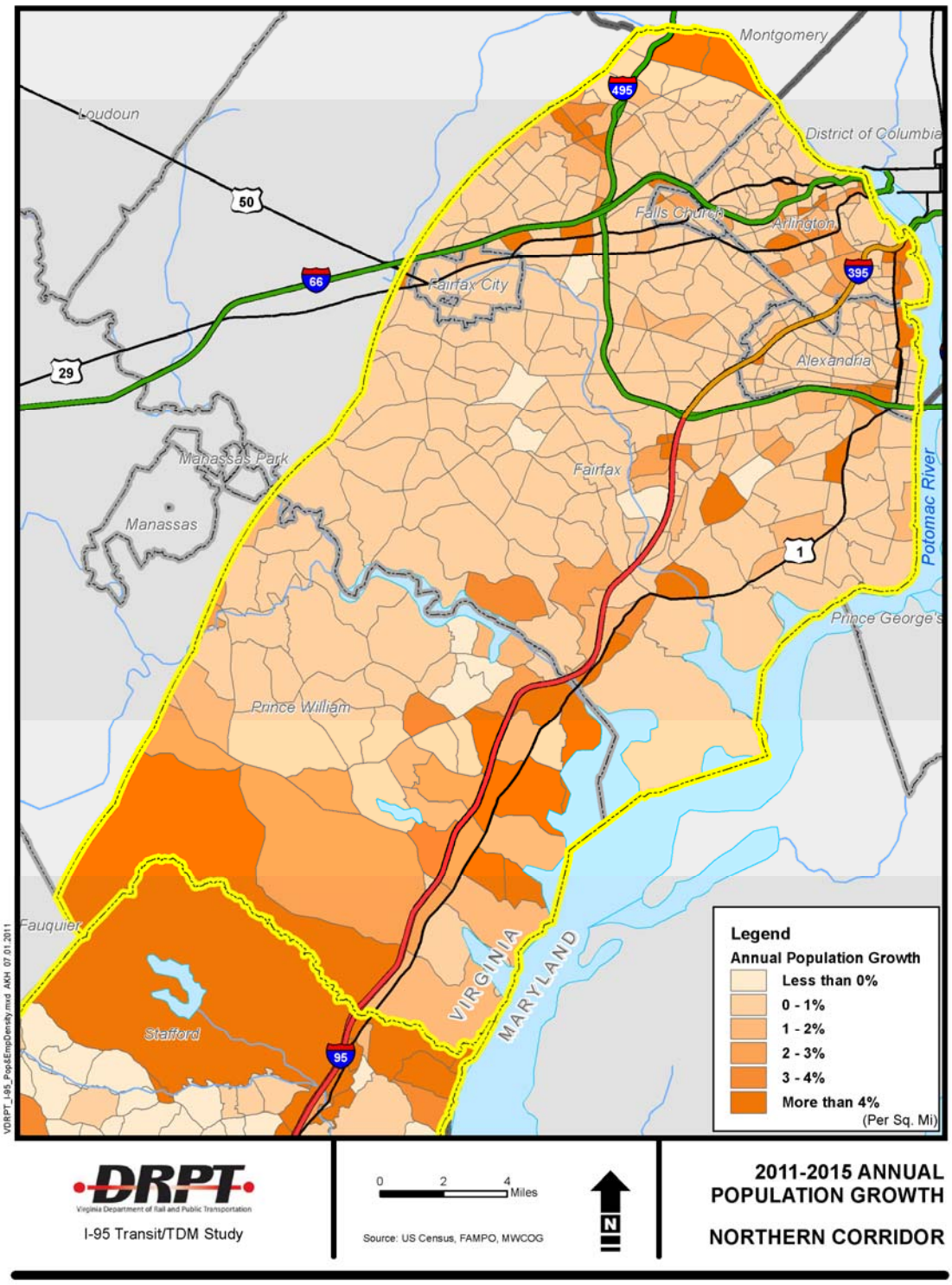
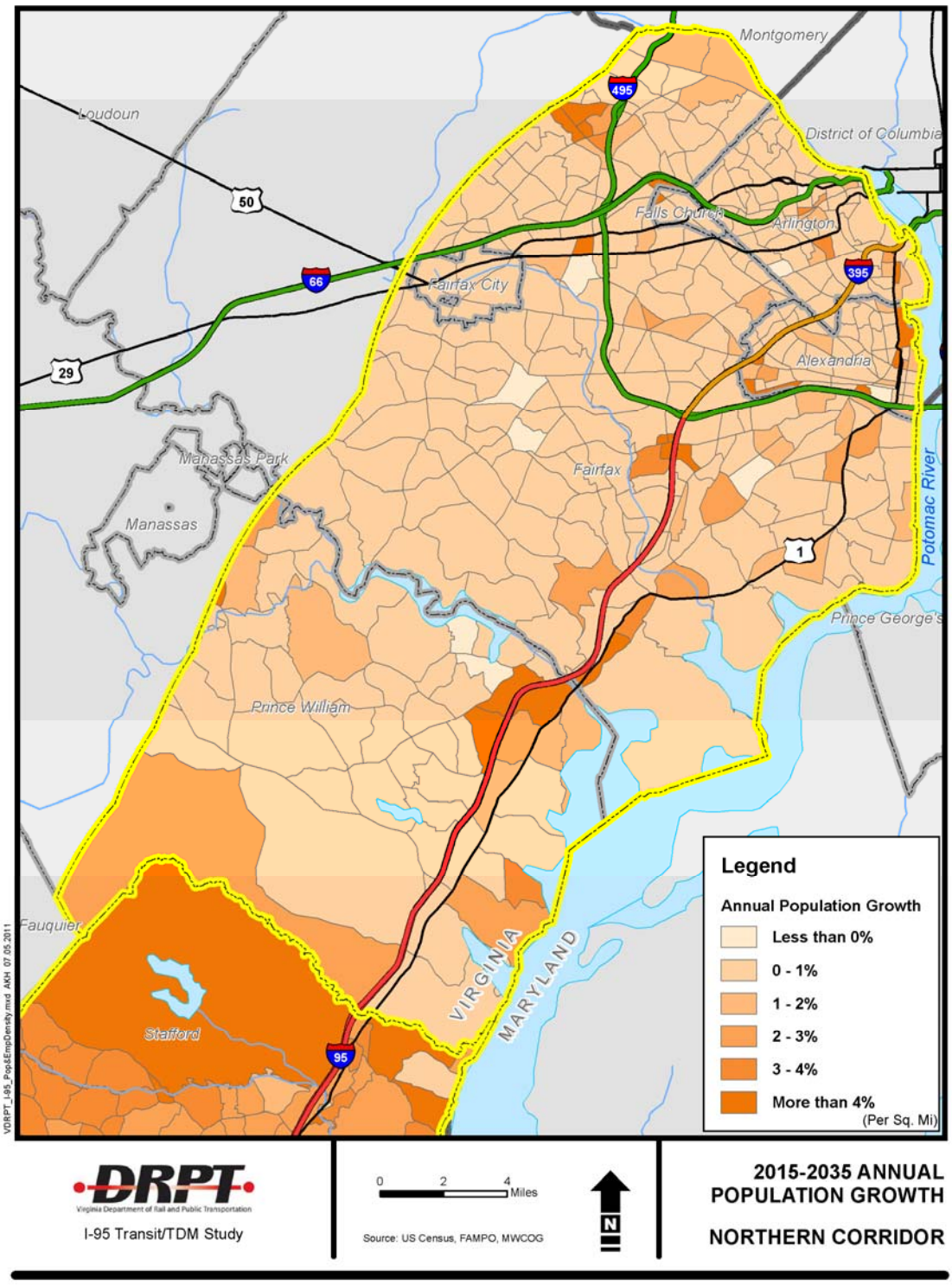


Figure 3-7: 2015-2035 Annual Population Growth - Northern Corridor



3.2.3 Employment Density

As shown in **Figures 3-8** through **3-10**, employment density in 2011, 2015, and 2035 generally follows population patterns. Zones in Arlington County, the City of Alexandria, Fairfax City, Tysons Corner, and Fort Belvoir are projected to have the highest employment density (more than 10,000 jobs per square mile). The highest concentration of employment in Prince William County in all forecast years is projected along the I-95 corridor. The lowest projected employment density is in the rural zones.

3.2.4 Annual Employment Growth

Figures 3-11 and **3-12** show the projected annual employment growth in the Northern Corridor. As shown in **Figure 3-11,** the highest 2011-2015 annual employment growth areas (annual growth of three percent or more) will be along I-95 in Prince William County, particularly in Woodbridge and Dale City. In Fairfax County, the Fort Belvoir area is projected to experience the highest employment growth. Notably, by September 2011, the U.S. Army plans to relocate about 8,500 jobs to Fort Belvoir North Area and 6,400 jobs to the Mark Center in Alexandria as part of the Base Realignment and Closure (BRAC). Once the BRAC relocation is complete, employment at Fort Belvoir, the Fort Belvoir North Area and the Mark Center will total more than 43,000. **Figure 3-12** shows that between 2015 and 2035, high employment growth is projected along the I-95 corridor in Prince William County, and U.S. 1 corridor from Fort Belvoir to the I-495 interchange.

3.2.5 Minority Populations

Figure 3-13 presents the percent of minority populations for the Northern Corridor at the census block group level. This 2005 - 2009 data was obtained from the American Community Survey (ACS).

3.2.6 Households Below Poverty Level

Figure 3-14 presents the percent of households below the poverty level for the Northern Corridor at the census block group level. This 2005 - 2009 data was obtained from the American Community Survey (ACS). Poverty level definitions vary depending on household size. For example, the Census-defined poverty level in 2009 for a four-person household was approximately $22,000.

Figure 3-8: 2011 Employment Density - Northern Corridor

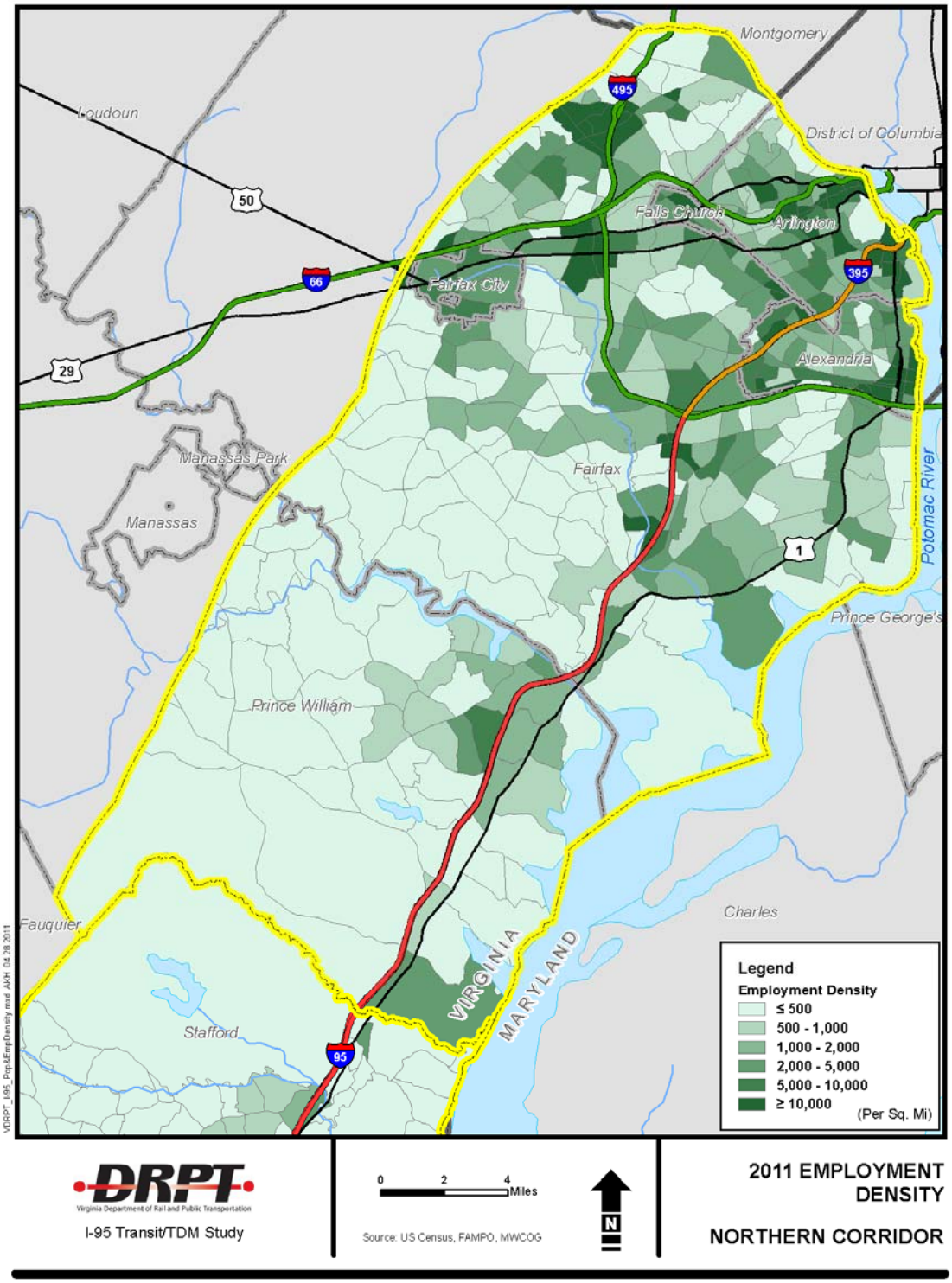


Figure 3-9: 2015 Employment Density - Northern Corridor

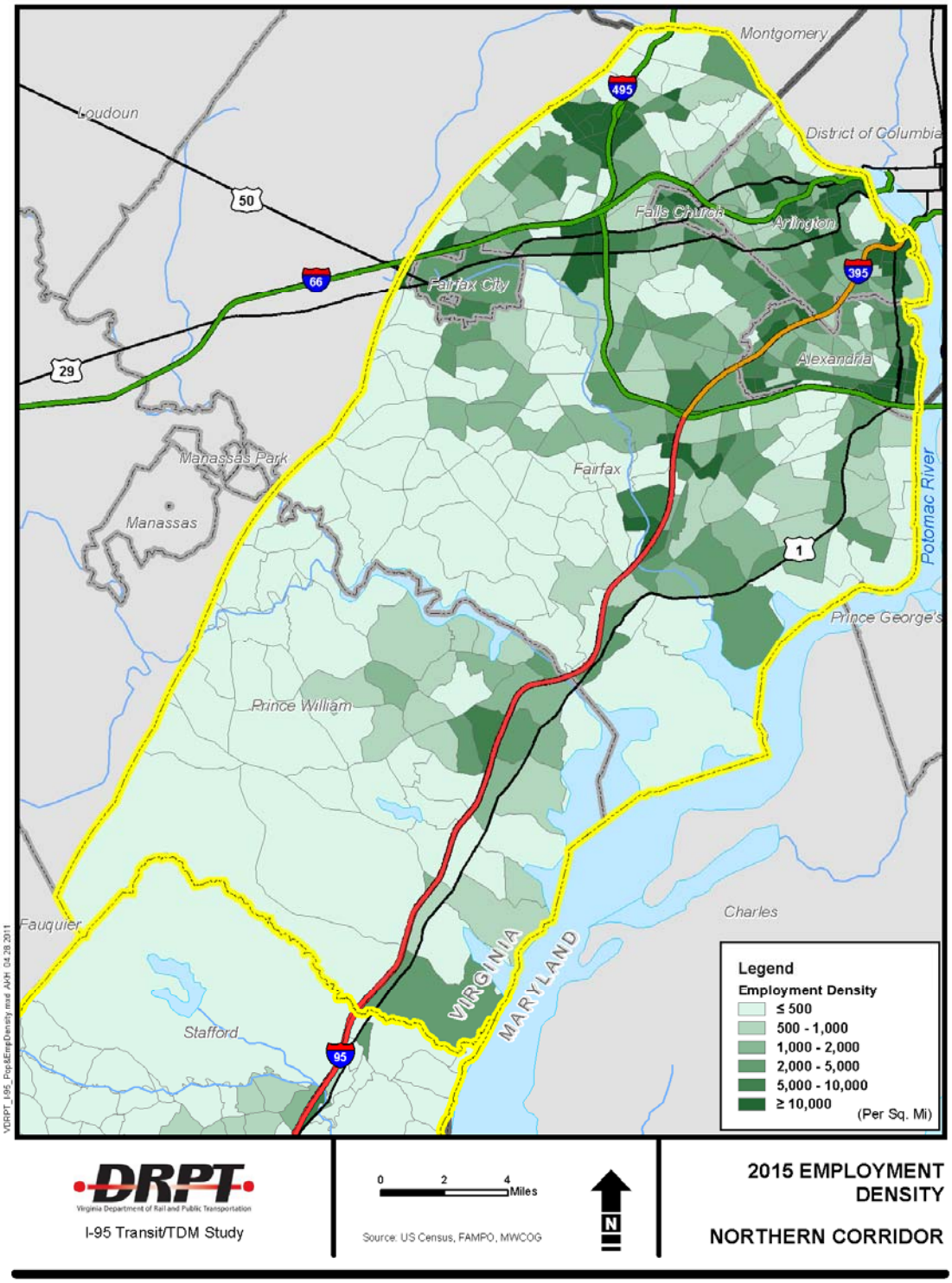


Figure 3-10: 2035 Employment Density - Northern Corridor

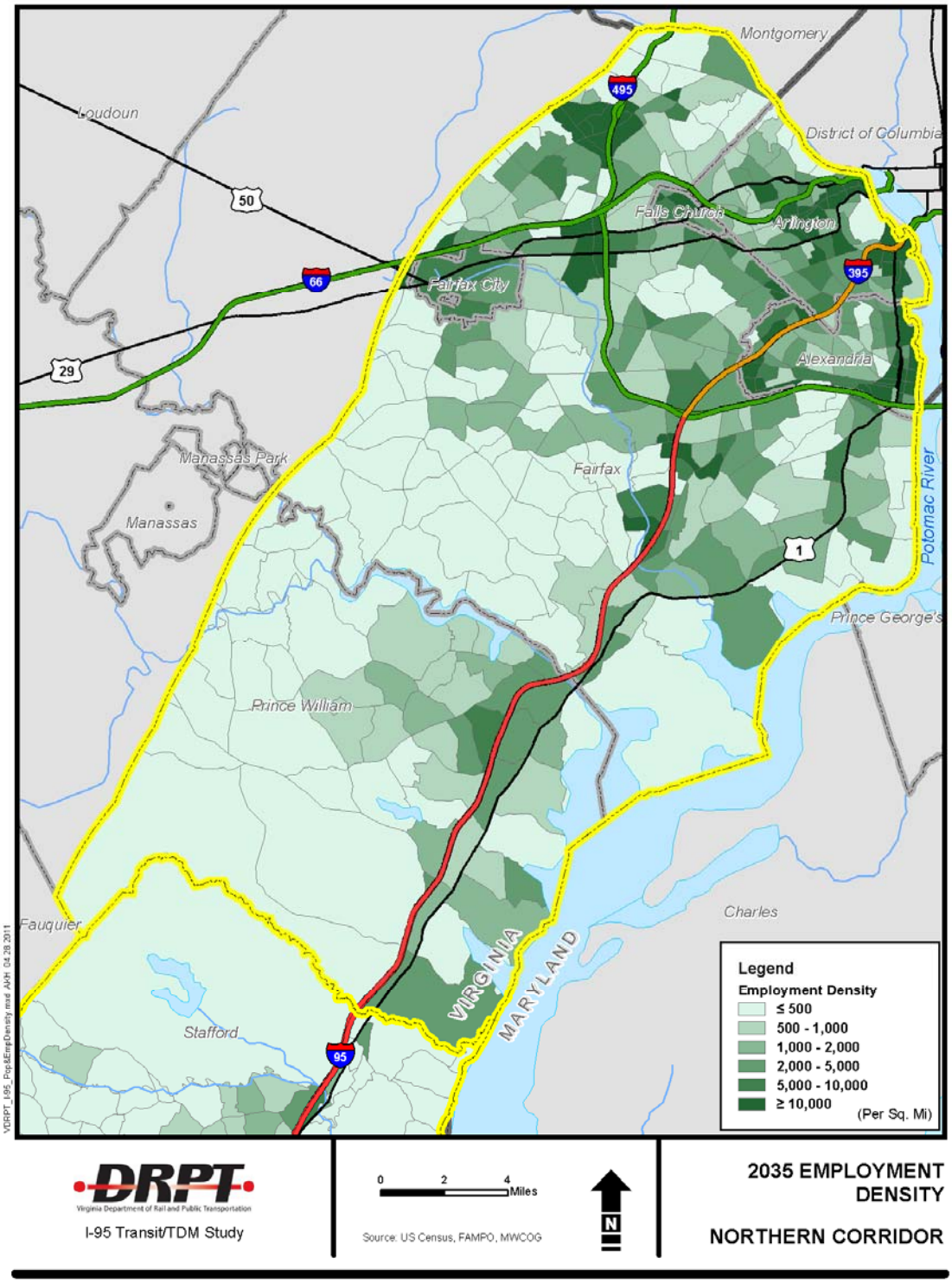


Figure 3-11: 2011-2015 Annual Employment Growth - Northern Corridor

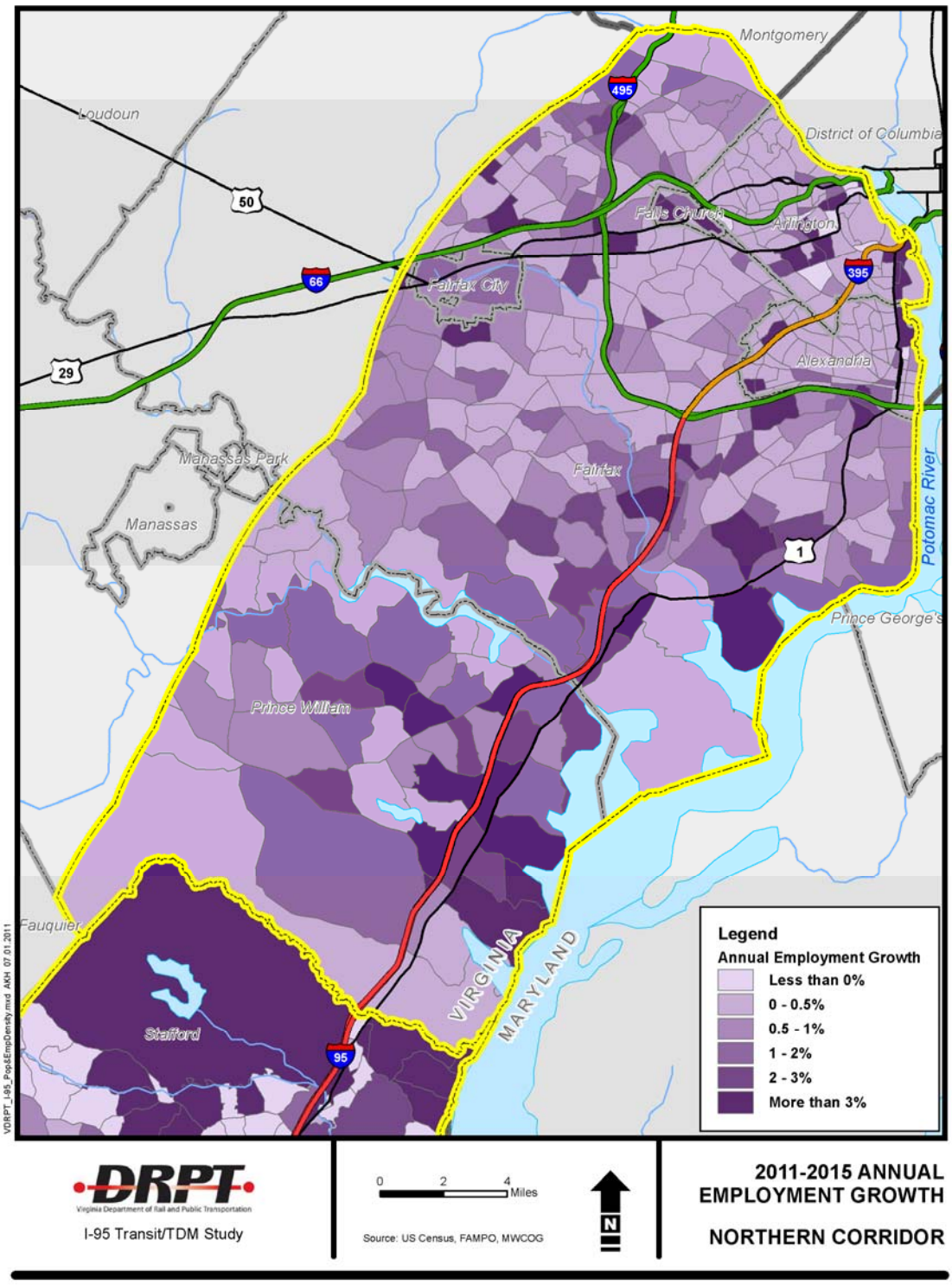


Figure 3-12: 2015-2035 Annual Employment Growth - Northern Corridor

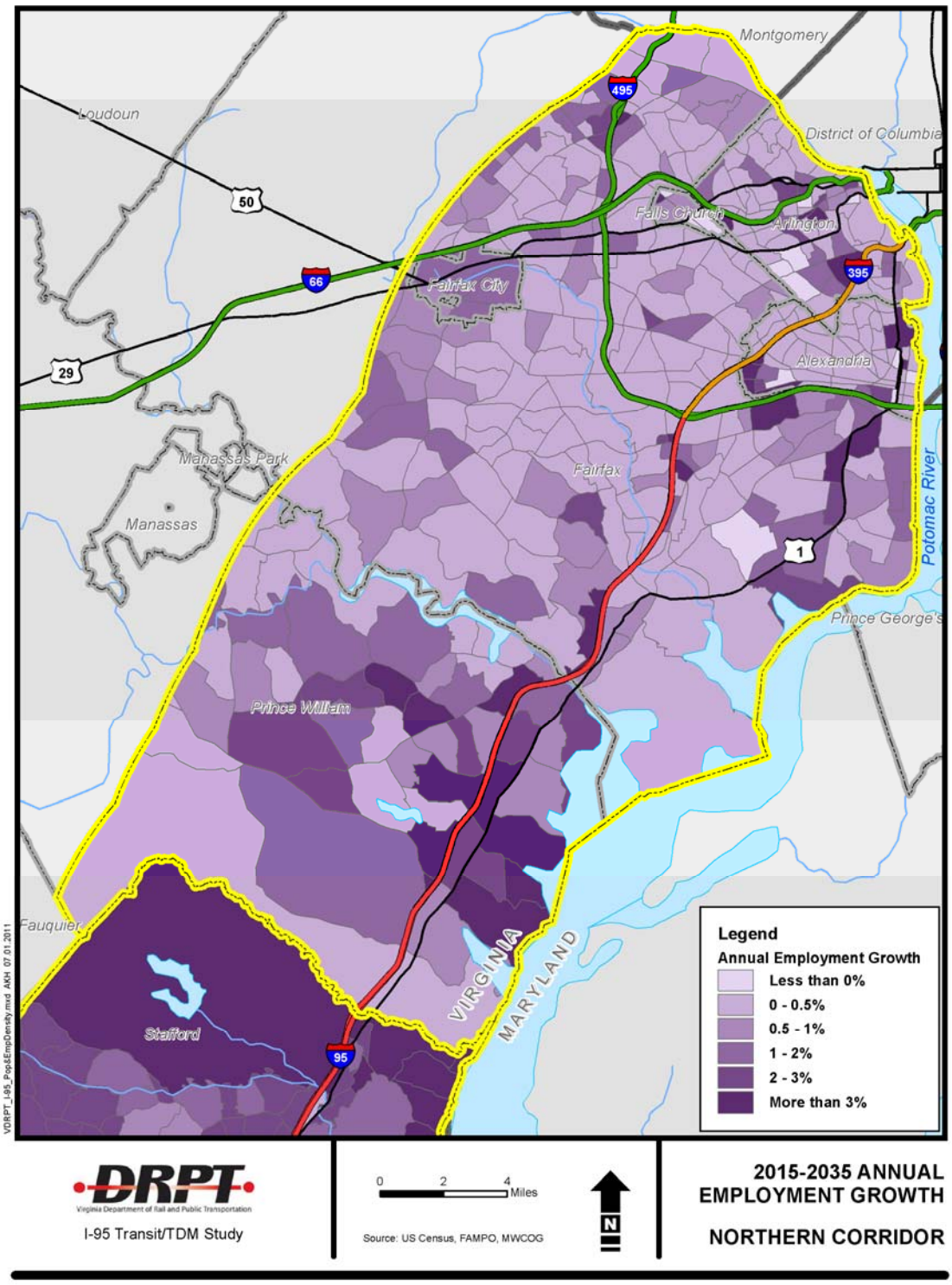


Figure 3-13: 2009 Minority Populations – Northern Corridor

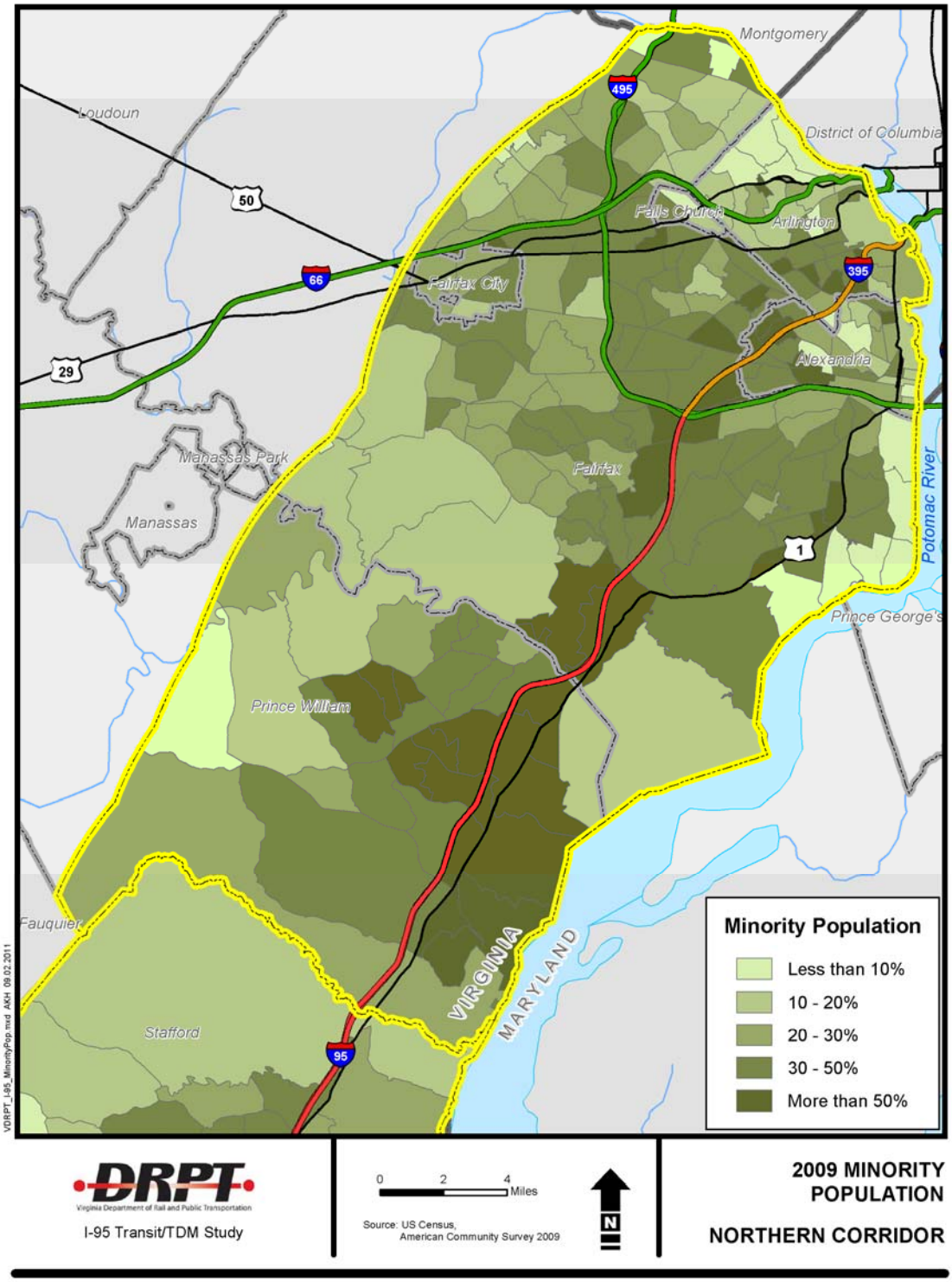
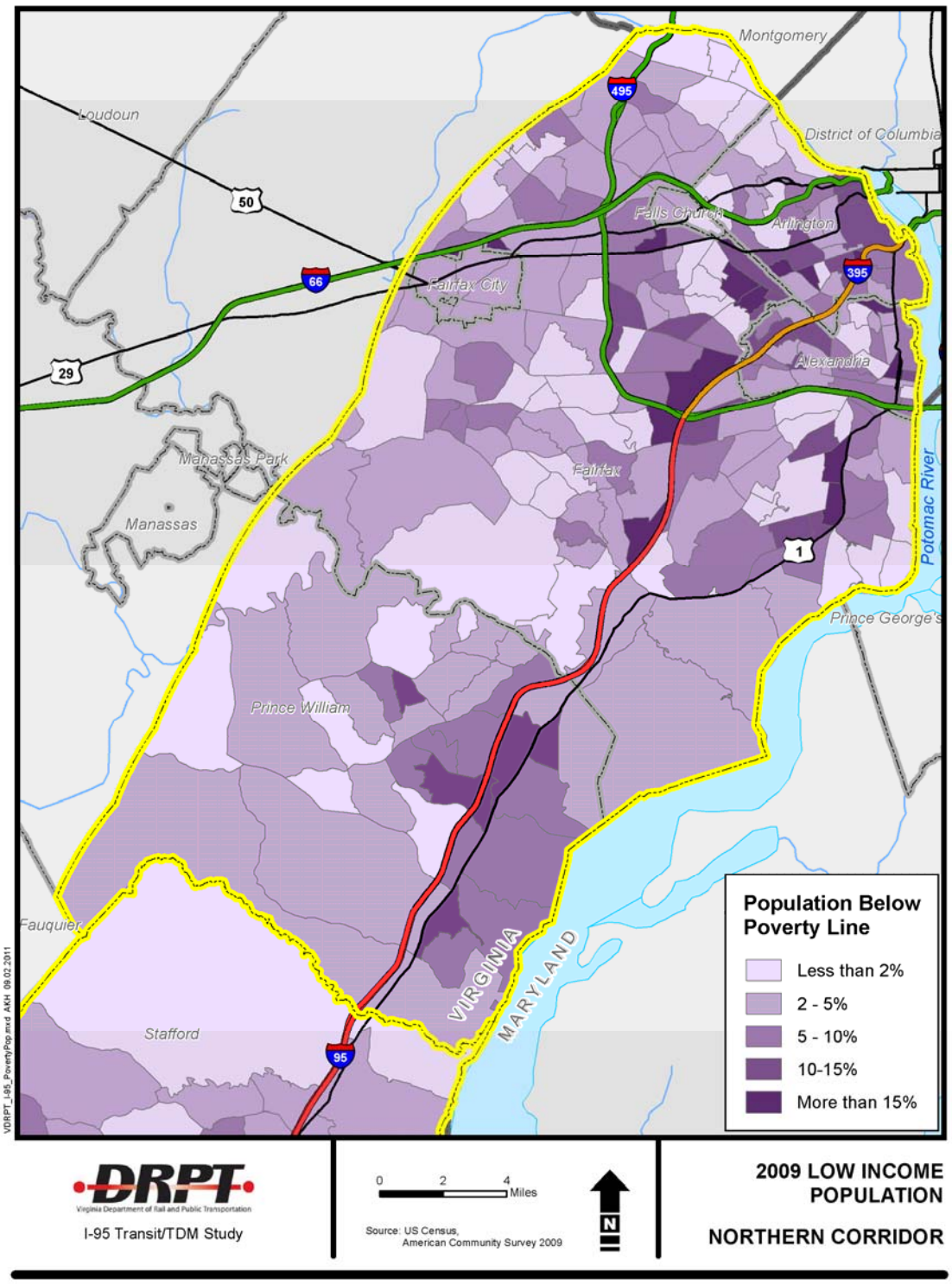


Figure 3-14: 2009 Households Below Poverty – Northern Corridor



3.3 Southern Corridor Characteristics (Stafford and Spotsylvania Counties)

3.3.1 Population Density

The projected population density in the study area is generally lower in the Southern Corridor than in Northern Corridor. As shown in **Figures 3-15** through **3-17,** the highest projected population density in the Southern Corridor will be located along the I-95 corridor, especially the Marine Corps Base Quantico zones in Stafford County and Fredericksburg in Spotsylvania County. Unlike in the Northern Corridor, only a small part of Fredericksburg is projected to have population density of 10,000 or more persons per sq. mile in 2011. By 2035, areas south and east of the Marine Corps Base Quantico will have population density of more than 10,000 persons per sq. mile, and portions of Spotsylvania County will have population density between 5,000 to 10,000 persons per sq. mile.

3.3.2 Annual Population Growth

Figures 3-18 and **3-19** show the projected annual population growth. Forecast data shows that virtually all areas in the Southern Corridor are projecting a substantial increase in population density (more than three percent annual growth), particularly between 2015 and 2035, with the western and northern zones of Stafford County, western zones of Spotsylvania County, and both counties' border areas with neighboring counties (King George and Caroline) attracting the majority of new residents.

Unlike in the Northern Corridor, virtually no areas are projected to decline in population between 2015 and 2035, although quite a few are forecast to do so between 2011 and 2015. As the study area's population shifts southward from the northern suburban areas of Washington, D.C., likely migration areas include the southern portion of the Northern Corridor between 2011 and 2015 (Prince William County), and Southern Corridor's Stafford and Spotsylvania Counties between 2015 and 2035.

Figure 3-15: 2011 Population Density – Southern Corridor

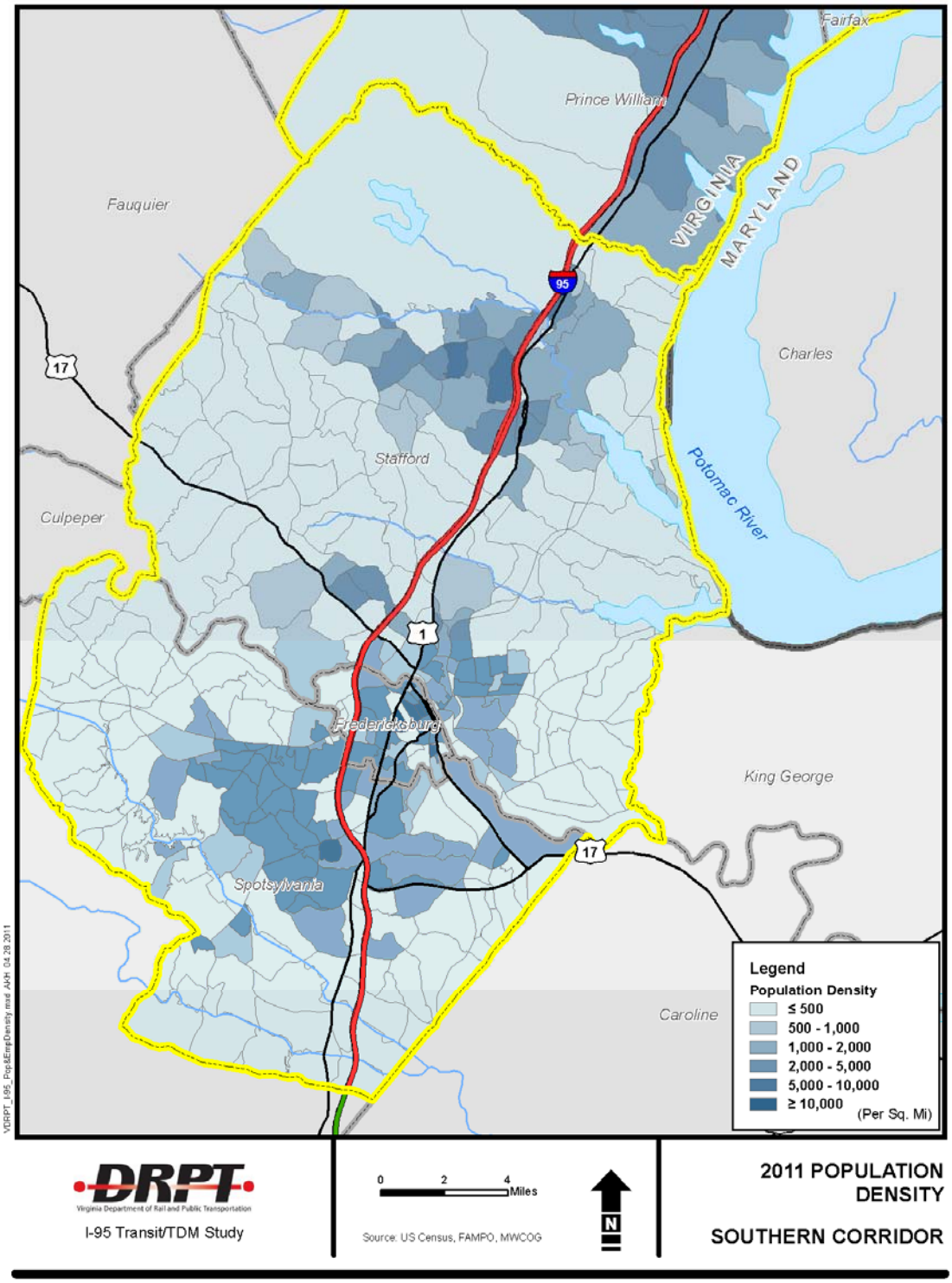


Figure 3-16: 2015 Population Density – Southern Corridor

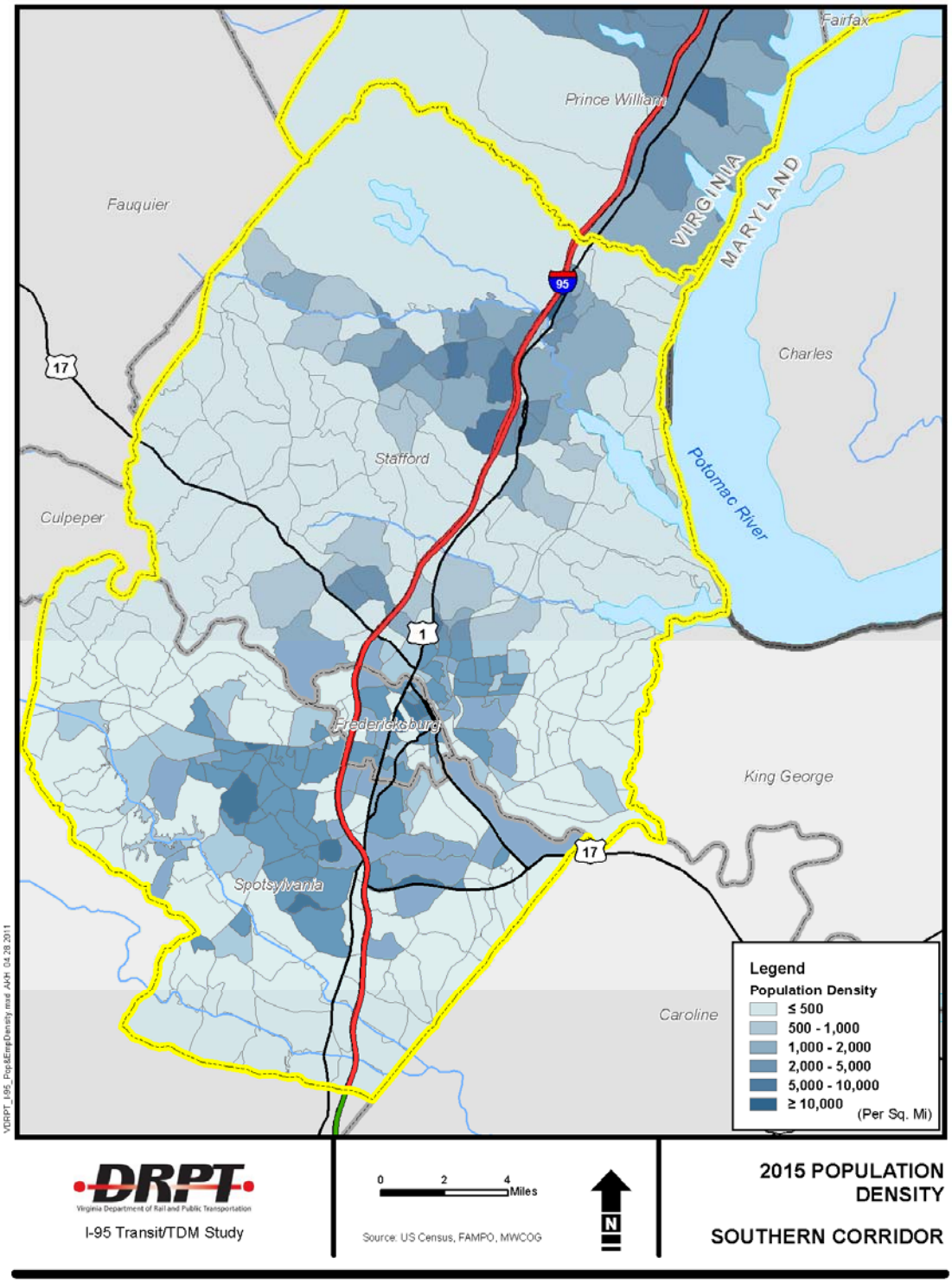


Figure 3-17: 2035 Population Density – Southern Corridor

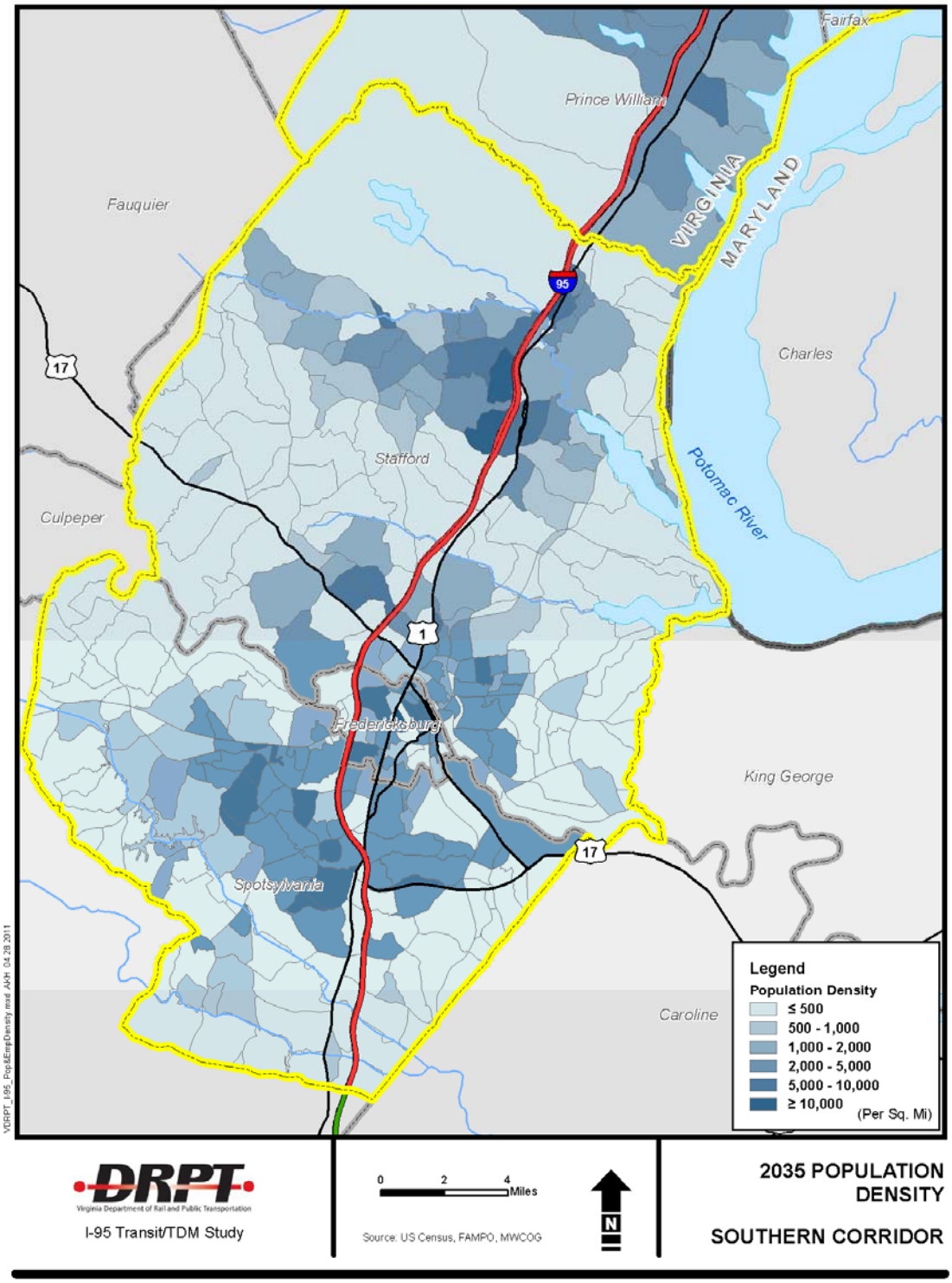


Figure 3-18: 2011-2015 Annual Population Growth - Southern Corridor

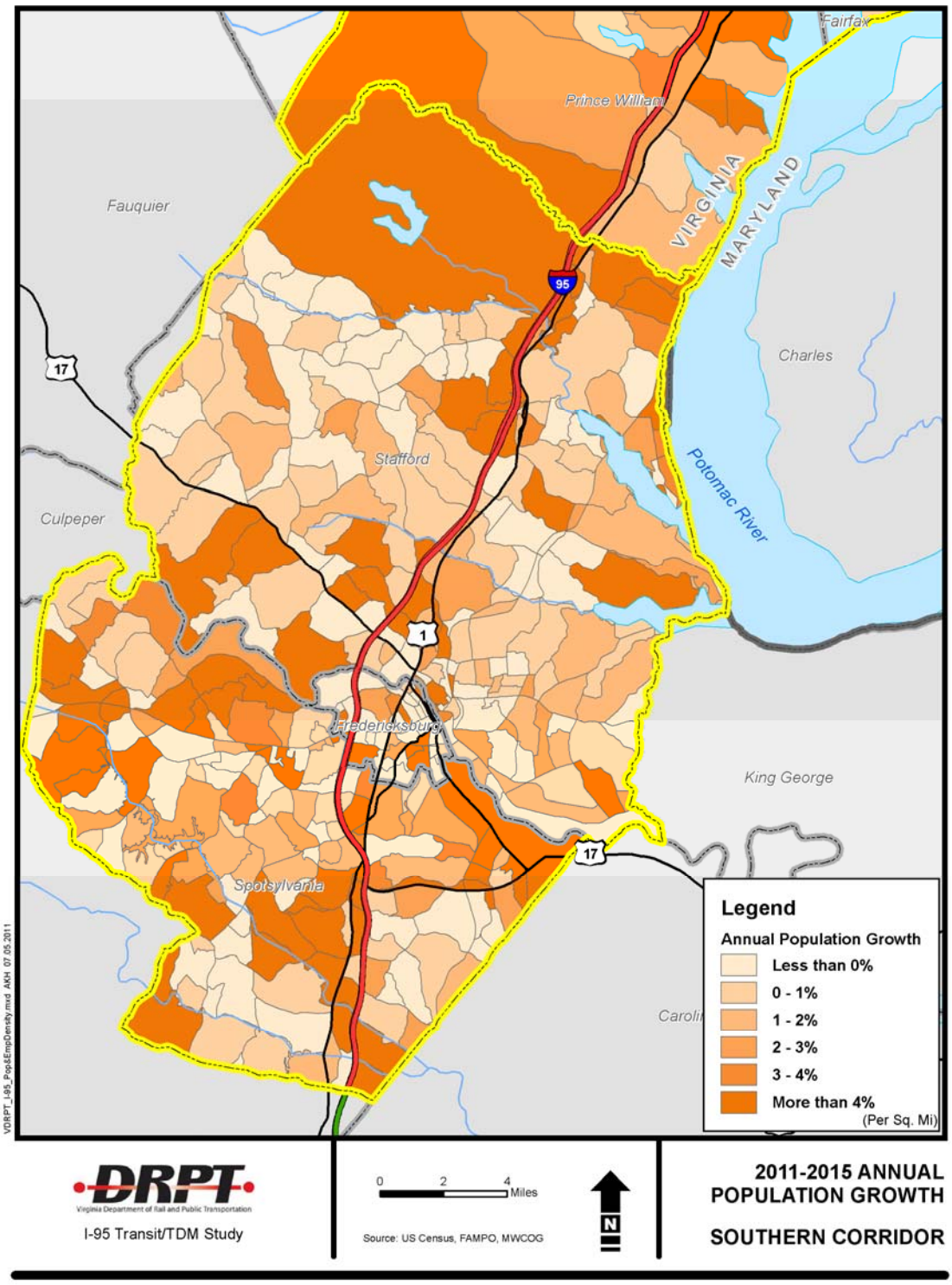
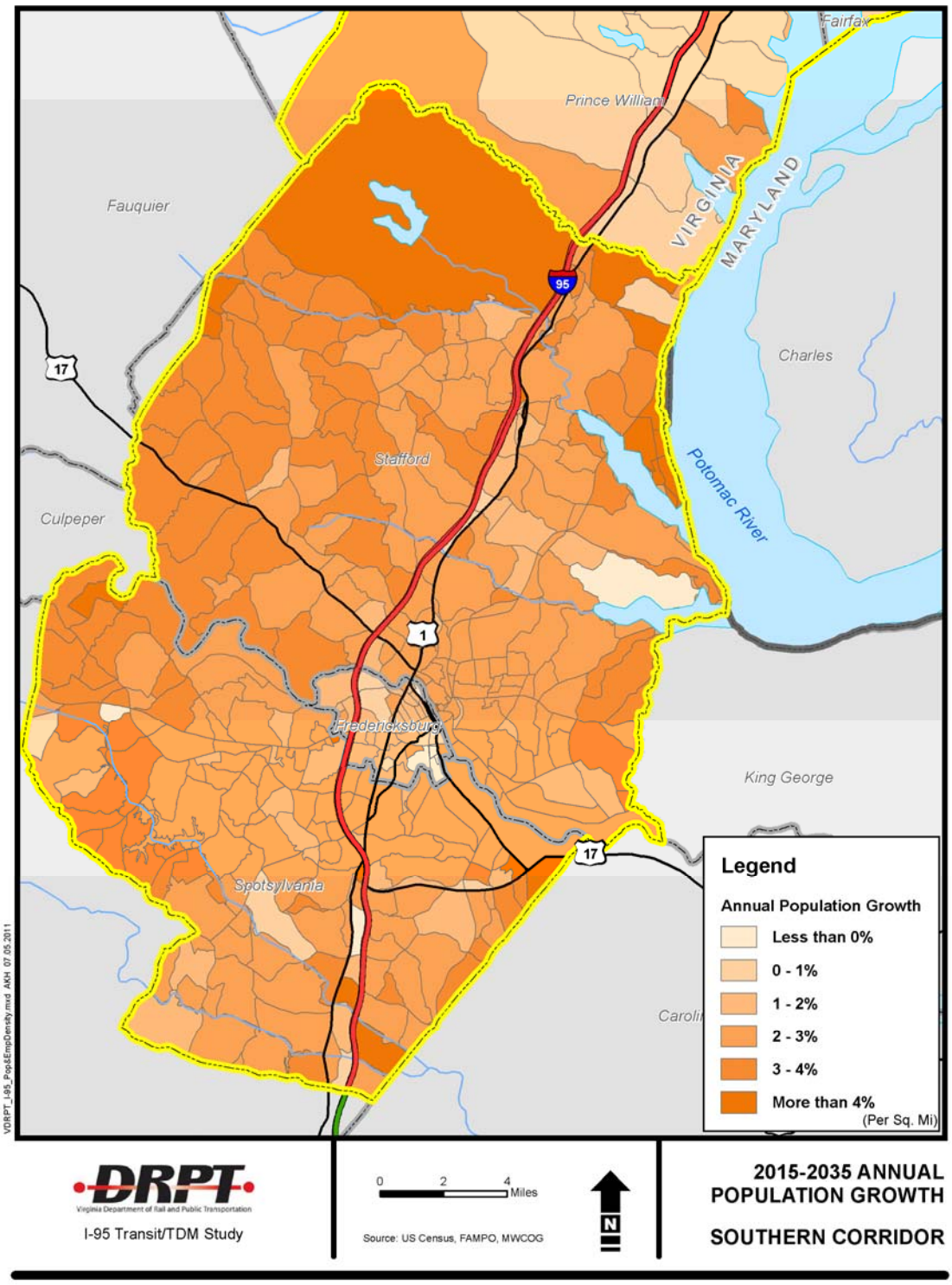


Figure 3-19: 2015-2035 Annual Population Growth - Southern Corridor



3.3.3 Employment Density

As shown in **Figures 3-20** through **3-22**, employment density in the Southern Corridor in 2011, 2015, and 2035 is projected to be concentrated in the Fredericksburg area and along the I-95 and U.S. 1 corridors. The U.S. 17 corridor southeast of Fredericksburg is projected to offer more employment per sq. mile after 2015 as well.

3.3.4 Annual Employment Growth

Figures 3-23 and **3-24** show the projected annual employment growth. **Figure 3-23** shows that from 2011 to 2015, the highest annual employment growth areas (annual growth of three percent or more) will be located along I-95 in northern Stafford County (the Marine Corps Base Quantico area) and the Fredericksburg area in Spotsylvania County.

Between 2015 and 2035, the projected pattern of widespread high population growth across nearly the entire Southern Corridor is similar for employment, with forecasts for most zones of two percent or more annual employment growth. As **Figure 3-24** shows, it is hard to point to specific areas projected to experience more employment growth than the others during that period – suggesting the strength of connection between high population and employment growth in the Southern Corridor.

3.3.5 Minority Populations

Figure 3-25 presents the percent of minority populations for the Southern Corridor at the census block group level. This 2005 - 2009 data was obtained from the American Community Survey (ACS).

3.3.6 Households Below Poverty Level

Figure 3-26 presents the percent of households below the poverty level for the Southern Corridor at the census block group level. This 2005 - 2009 data was obtained from the American Community Survey (ACS). Poverty level definitions vary depending on household size. For example, the Census-defined poverty level in 2009 for a four-person household was approximately $22,000.

Figure 3-20: 2011 Employment Density - Southern Corridor

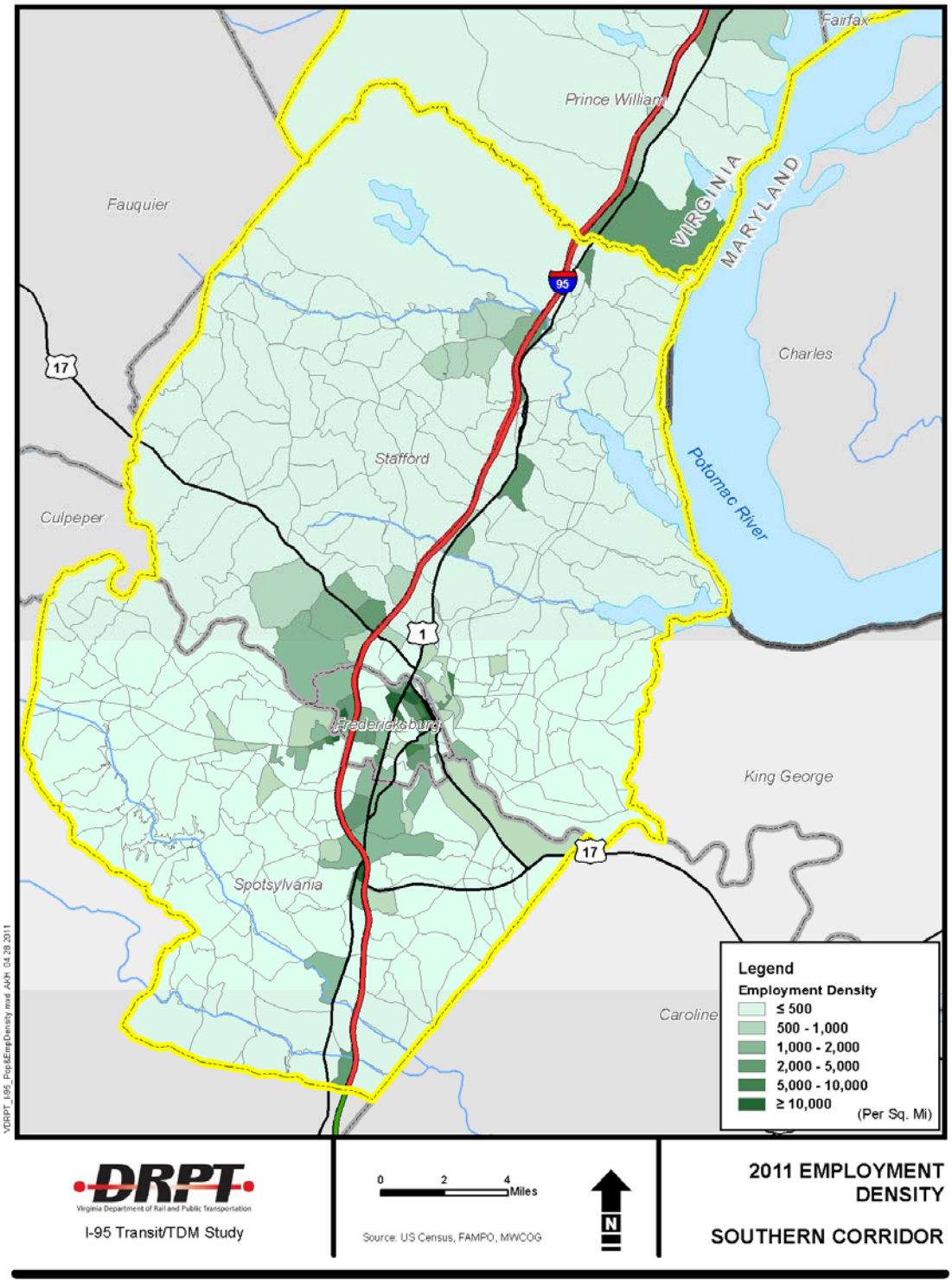


Figure 3-21: 2015 Employment Density - Southern Corridor

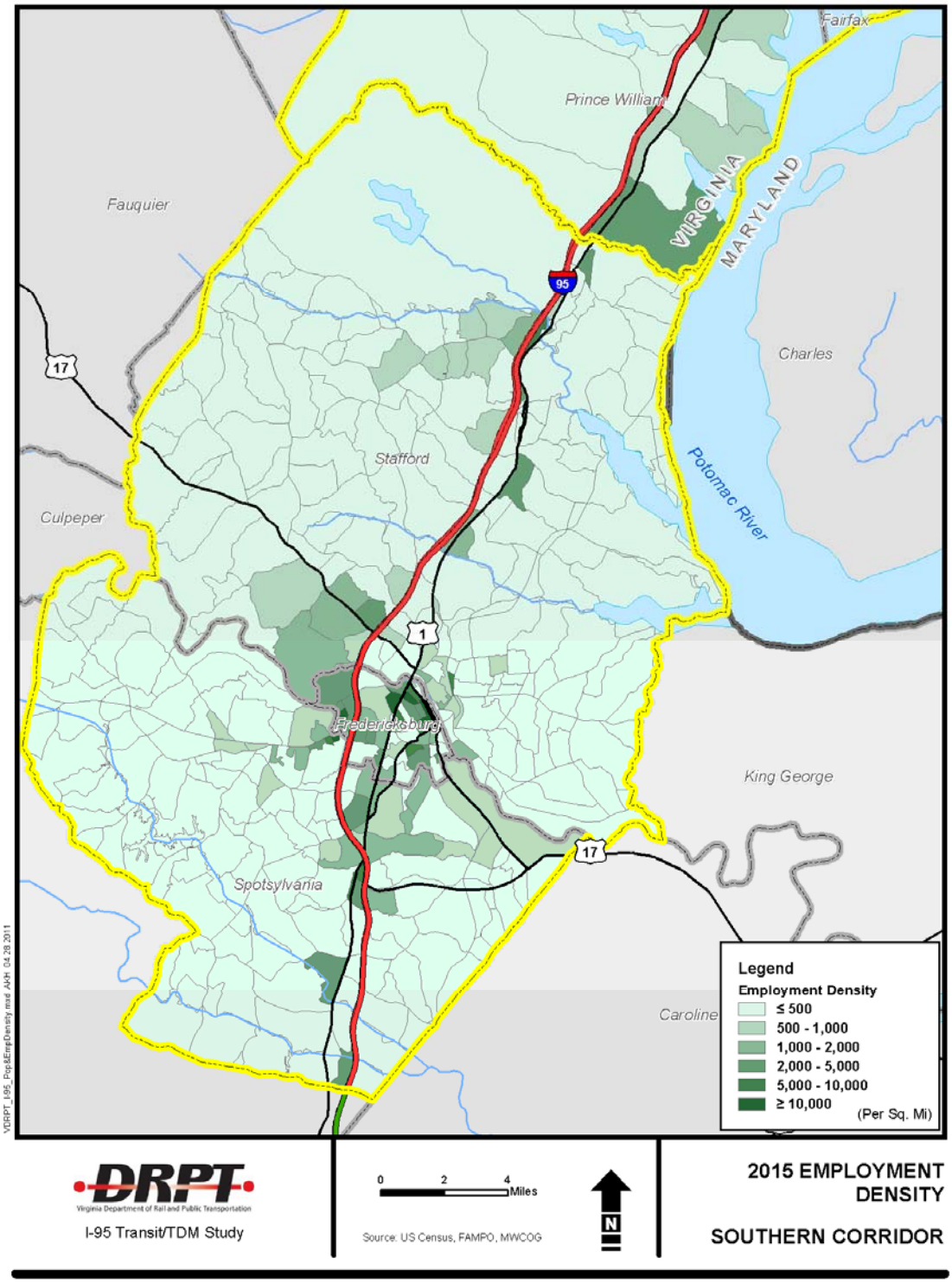


Figure 3-22: 2035 Employment Density - Southern Corridor

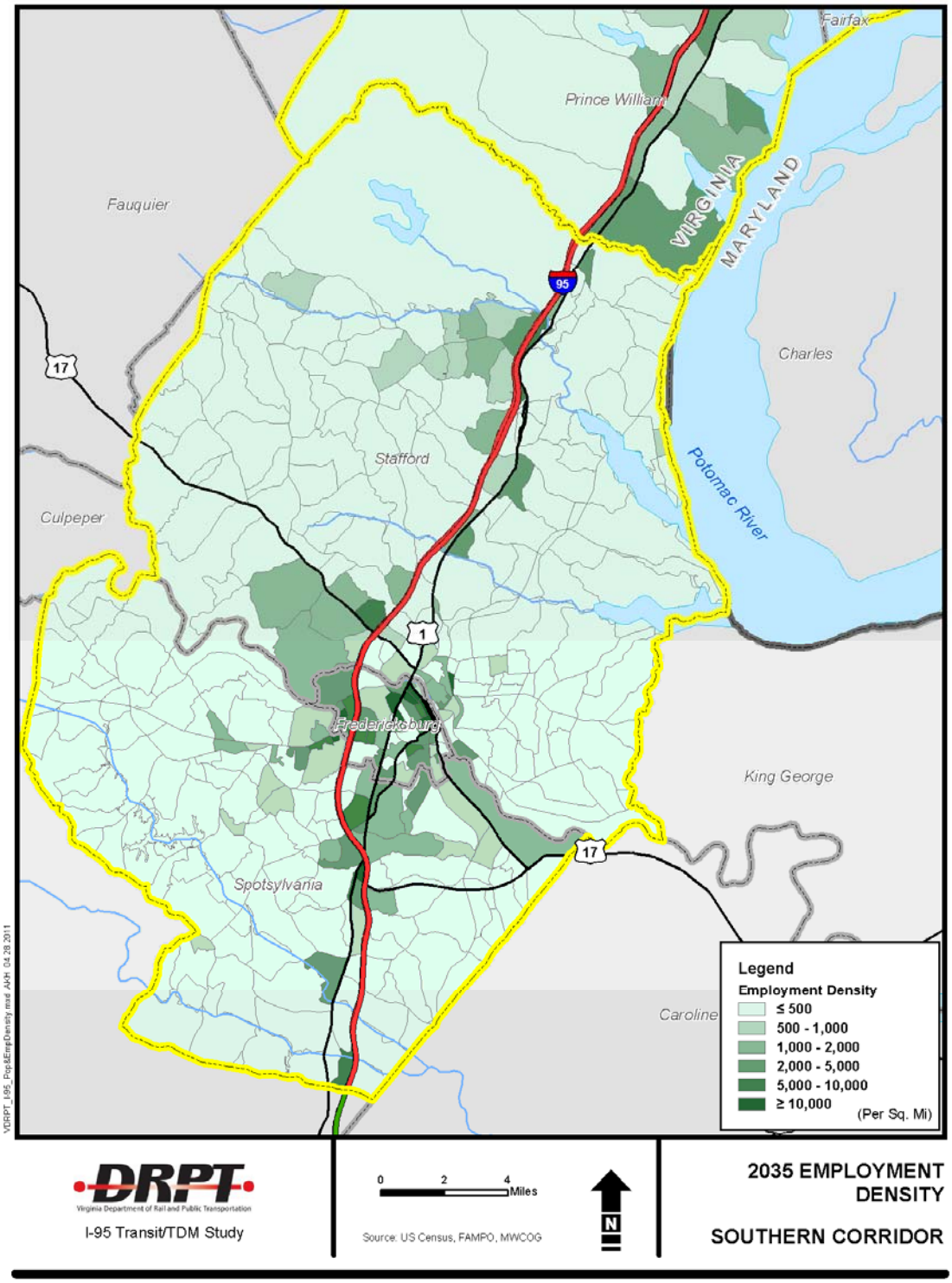


Figure 3-23: 2011-2015 Annual Employment Growth - Southern Corridor

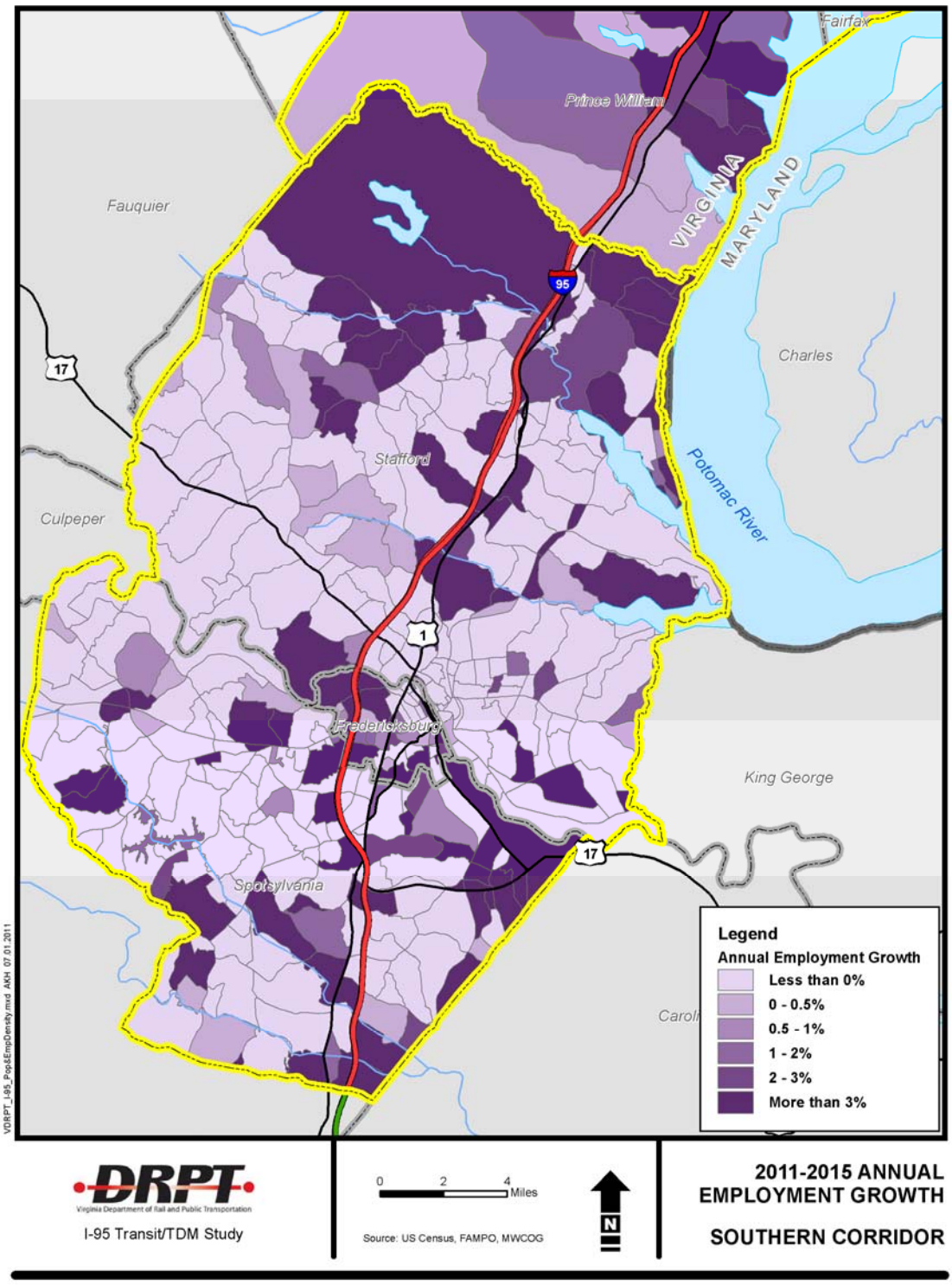


Figure 3-24: 2015-2035 Annual Employment Growth - Southern Corridor

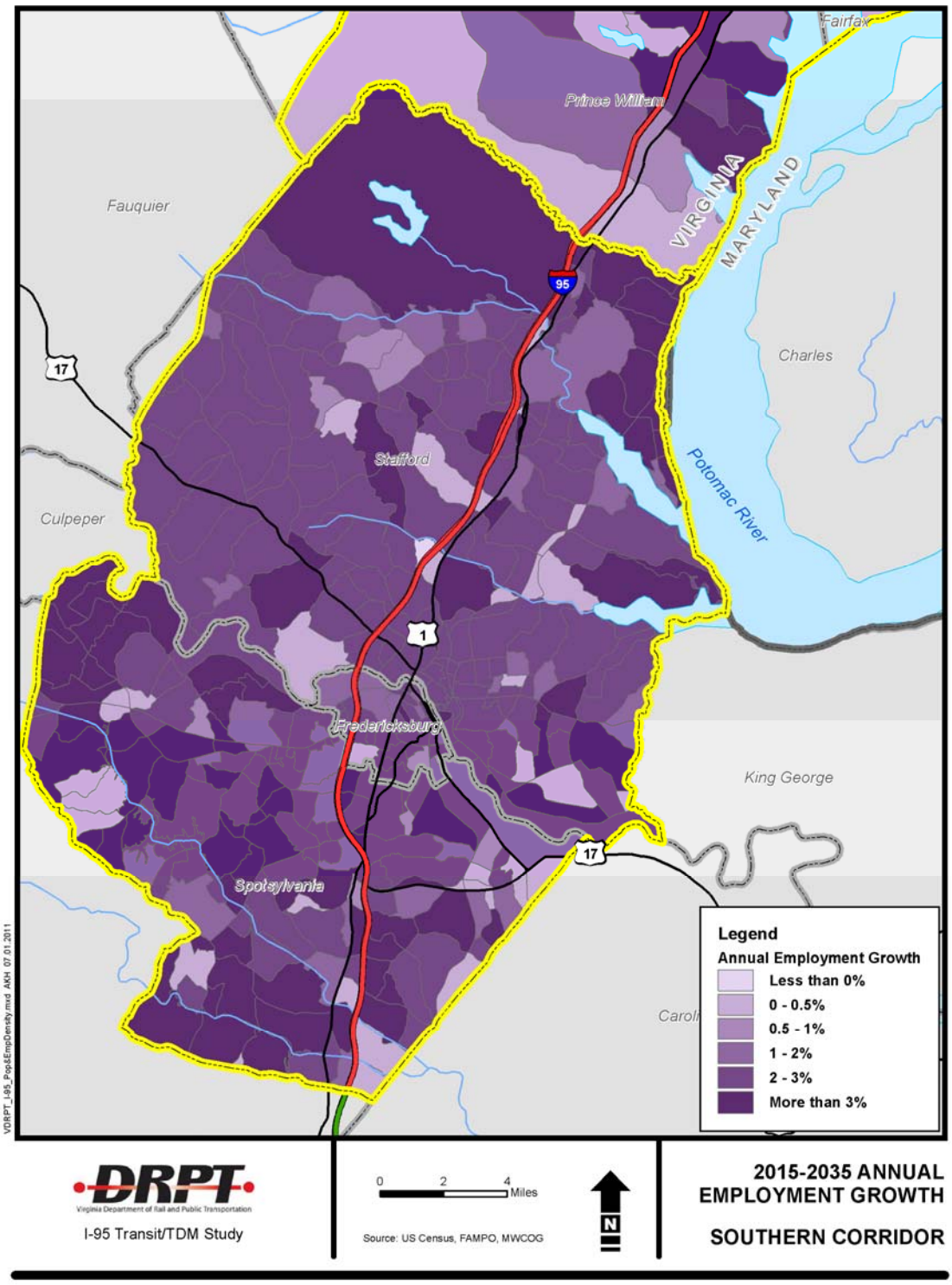


Figure 3-25: 2009 Minority Populations – Southern Corridor

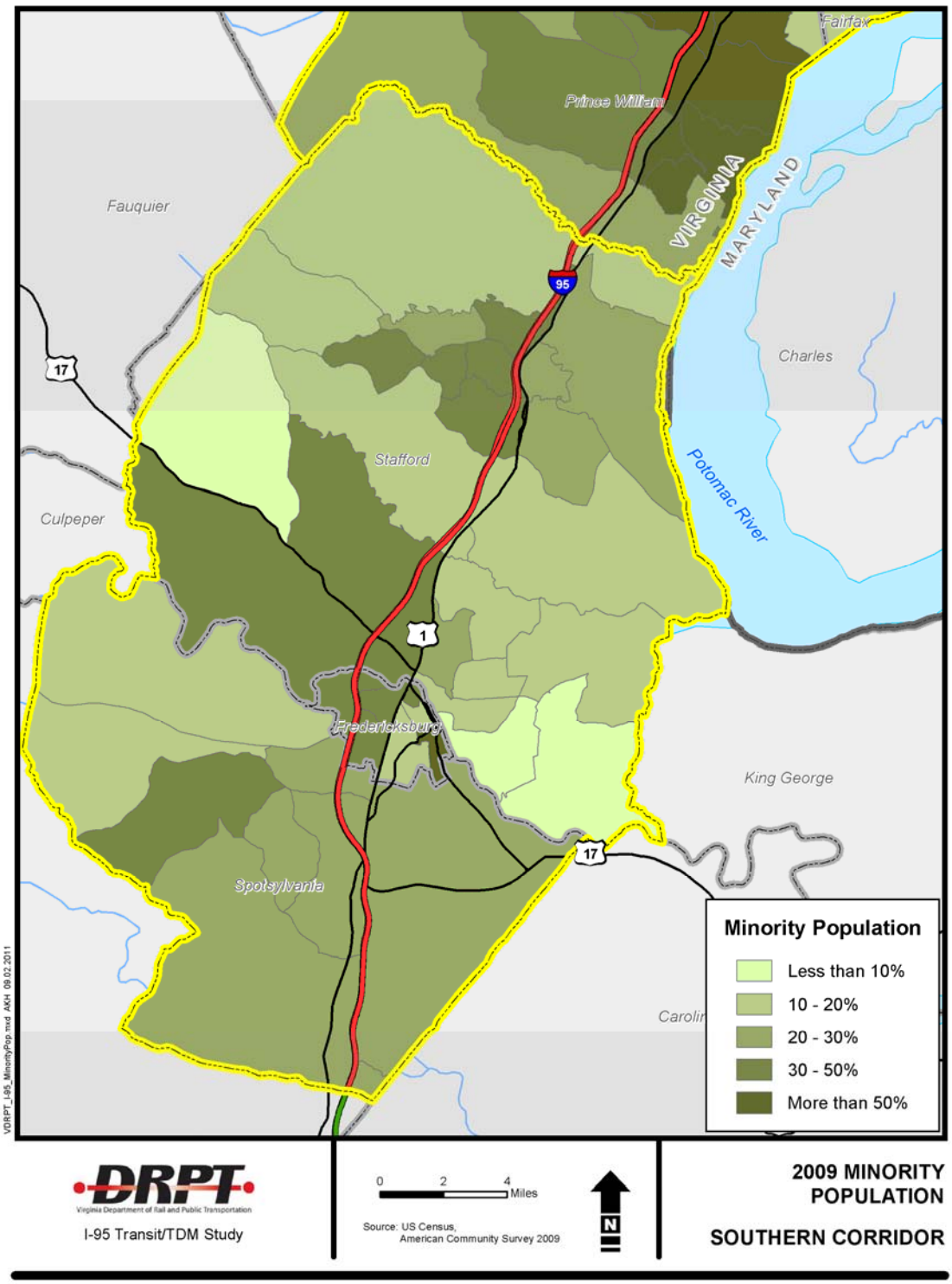
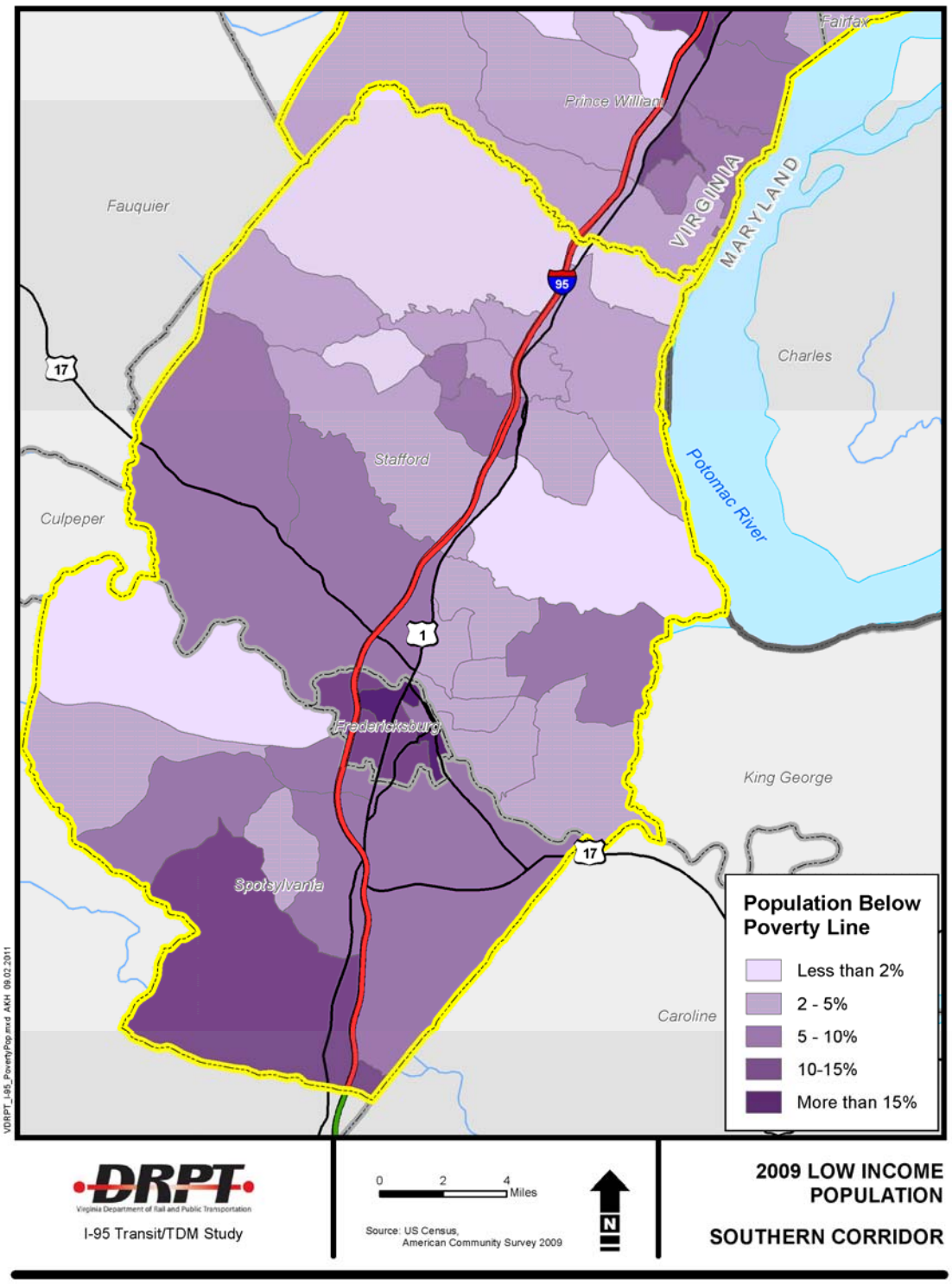


Figure 3-26: 2009 Households Below Poverty – Southern Corridor



4.0 Travel Pattern Characteristics

Demographic characteristics that were presented in the prior section have identified existing and projected concentrations of population and employment in the corridor. For purposes of transit service planning, it is also important to understand commuter travel flows (i.e., trip origins and destinations). This section of the Technical Memorandum presents current worker trip characteristics and projected growth in home-to-work flows and trips that originate along the redefined I-95 HOT/HOV Lanes project.

4.1 Existing Worker Travel Flows

Journey to work (i.e., home to work) travel flow information for the I-95 corridor was collected from the Census Transportation Planning Products (CTPP) program. The CTPP contains tabulated census demographic data that has been specially tabulated for transportation planners and other professionals who deal with the movement of people. The CTPP data used in this analysis is the most recently released and is based on the 2006-2008 Three-Year American Community Survey (ACS) data. Specifically, worker travel flow data was compiled from the CTPP.

4.1.1 Existing Northern Corridor Worker Travel Flows

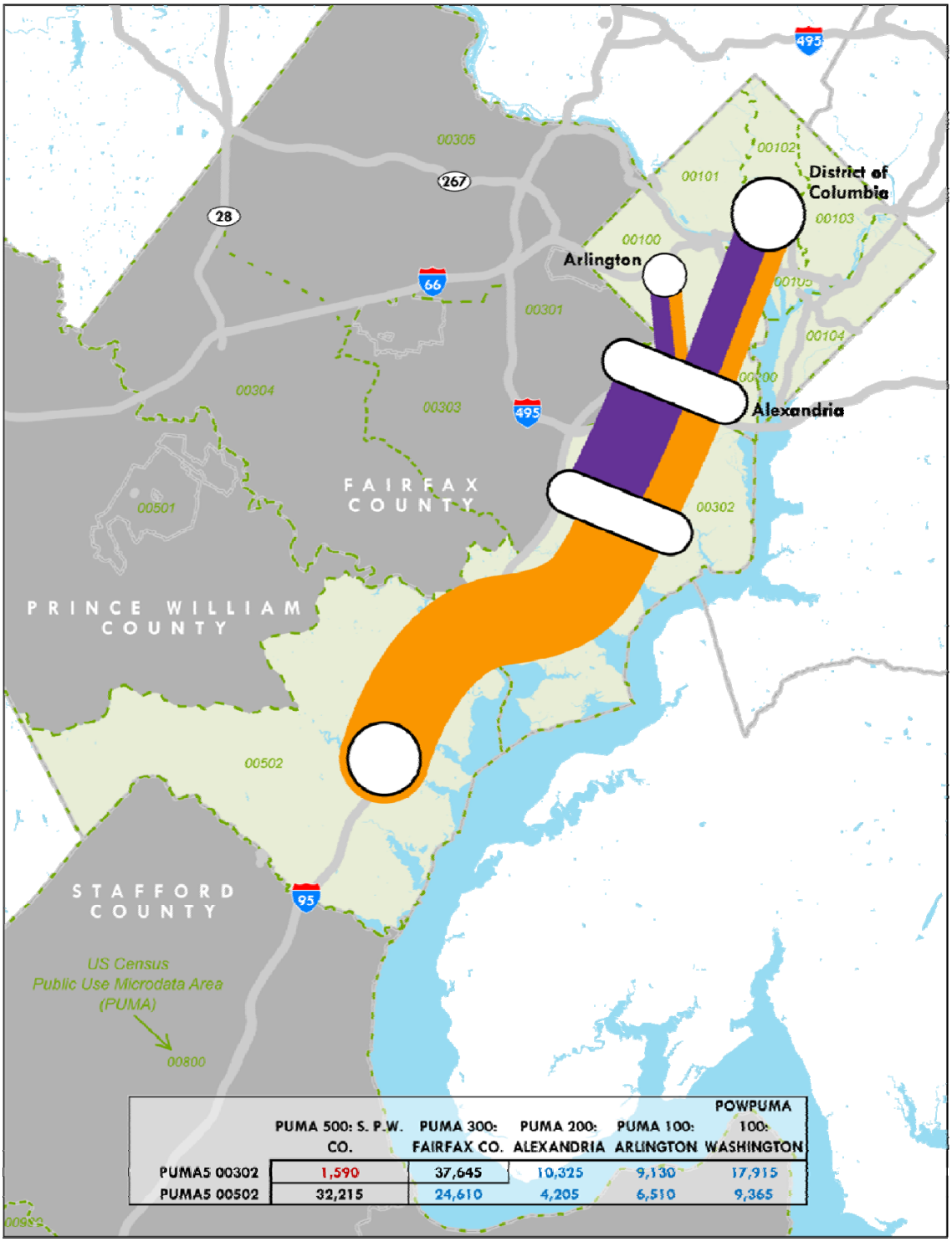
Worker travel flows for Prince William and Fairfax Counties were isolated at the Public Use Microdata Area (PUMA) level to isolate I-95 corridor worker trips. PUMAs are statistical geographic areas comprised of counties or census tracts and are used to relate and disseminate census data. Each PUMA area contains 100,000 or more persons and data within it is based on the 5-percent sample of the long-form decennial census. PUMA boundaries for this analysis come from 2000 Census definitions; however, data within the PUMAs are still based on the 2006-2008 ACS data from the CTPP. The Washington, D.C. area PUMA is defined as a Place of Work PUMA (POWPUMA), defined as the place of work on Census Data, and encompasses the four PUMAs within the District.

Figure 4-1 shows PUMA to PUMA worker flows for PUMA 502 (southeast Prince William County) and PUMA 302 (southeast Fairfax County) to Alexandria, Arlington, and Washington, D.C. Depicted worker flow data from South Prince William County is shown in orange, while South Fairfax County worker flow data is shown in purple. Worker flows are greatest where the flows are combined, as shown in the figure, between South Fairfax County and Alexandria. Over 57,000 workers are traveling north from the South Prince William County and South Fairfax County PUMAs to destinations within Alexandria, Arlington, and Washington, D.C. Over 14,500 are traveling to Arlington, 15,600 are traveling to Alexandria and 27,300 are traveling to Washington, D.C. Another 24,600 works are traveling from South Prince William County to South Fairfax County.

4.1.2 Existing Southern Corridor Worker Travel Flows

Figure 4-2 shows county and independent city worker flows from the southern portion of the I-95 corridor to major employment destinations in the north. Depicted worker flow data from Spotsylvania County is shown in green, Fredericksburg is shown in maroon and Stafford County is shown in blue. Worker flow data is shown to Prince William County, Fairfax County, Alexandria, Arlington and Washington, D.C. Nearly 16,500 work trips are flowing from Spotsylvania County, Fredericksburg and Stafford County to Alexandria, Arlington and Washington, D.C. Another 27,500 work trips from these three areas are traveling to Prince William County and Fairfax County.

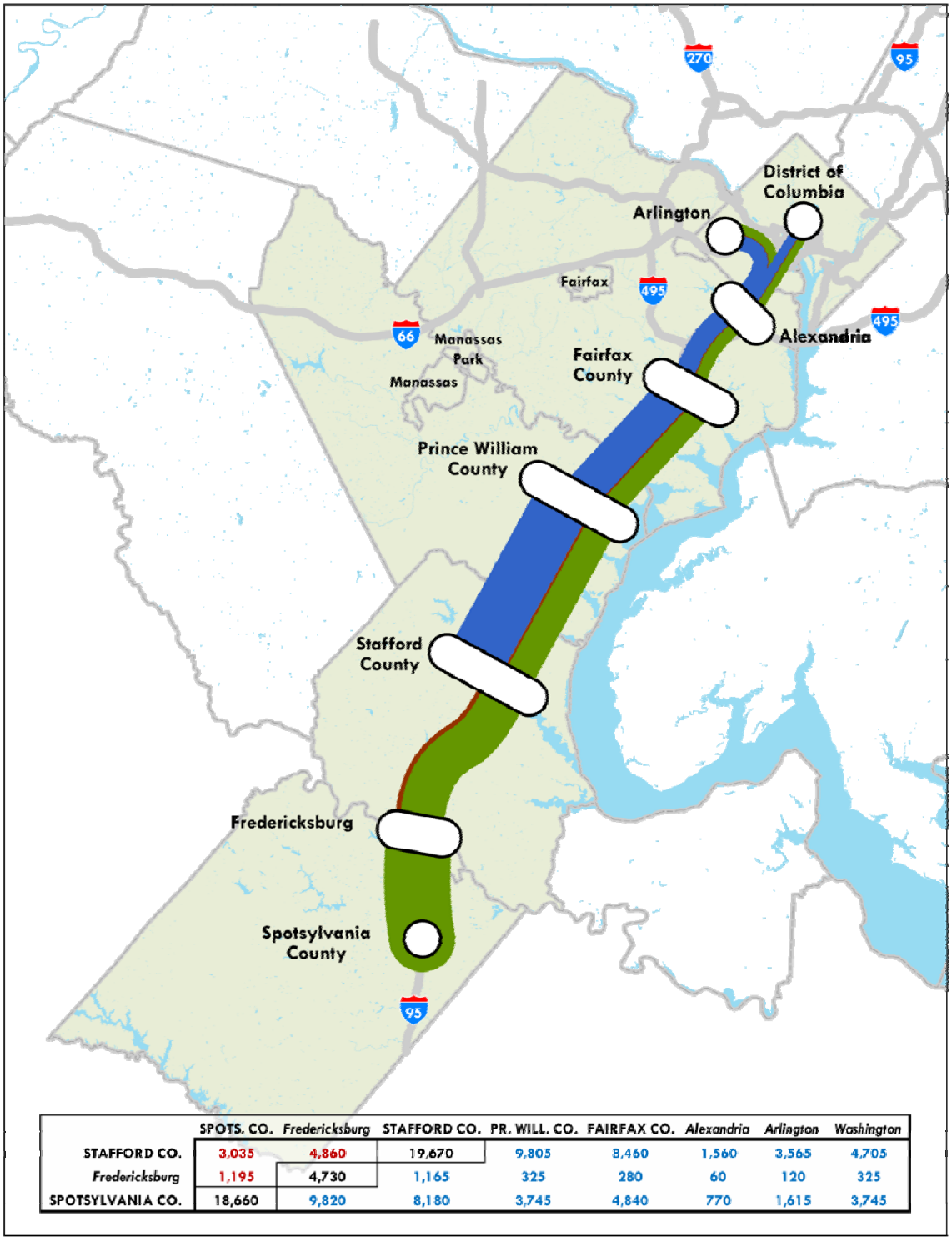
Figure 4-1: Estimated Existing North I-95 Corridor Worker Travel Flows



	PUMA 500: S. P.W. CO.	PUMA 300: FAIRFAX CO.	PUMA 200: ALEXANDRIA	PUMA 100: ARLINGTON	POWPUMA 100: WASHINGTON
PUMA5 00302	1,590	37,645	10,325	9,130	17,915
PUMA5 00502	32,215	24,610	4,205	6,510	9,365

Source: 2006-2008 American Community Survey Data
Census Transportation Planning Products

Figure 4-1: Estimated Existing South I-95 Corridor Worker Travel Flows



	SPOTS. CO.	Fredericksburg	STAFFORD CO.	PR. WILL. CO.	FAIRFAX CO.	Alexandria	Arlington	Washington
STAFFORD CO.	3,035	4,860	19,670	9,805	8,460	1,560	3,565	4,705
Fredericksburg	1,195	4,730	1,165	325	280	60	120	325
SPOTSYLVANIA CO.	18,660	9,820	8,180	3,745	4,840	770	1,615	3,745

Source: 2006-2008 American Community Survey Data
Census Transportation Planning Products

4.2 Projected Home-Based Work Trips

The Metropolitan Area Washington Council of Governments (MWCOG) travel demand model was used to assess projected home-based work (HBW) trip growth for the project corridor. Person trip tables were provided by MWCOG for the following years: 2005 (calibration year), 2011, 2020, 2030 and 2040. The MWCOG travel demand model includes traffic analysis zones (TAZs) for the entire I-95 corridor, including Stafford and Spotsylvania Counties. Trip tables from the travel demand model were interpolated to obtain estimates for this project's study years (2015 and 2035). Findings are as follows:

4.2.1 Northern Corridor Home-Based Work Trip Projections

The portion of Fairfax County considered to be in the I-95 travel shed was defined as being east of Burke Lake Road and south of I-495. Total HBW trip generation estimated for this area from the MWCOG model is noted below in **Table 4-1**:

Table 4-1: Fairfax County (I-95 Corridor Only) Daily Home-Based Work Trip Projections

	2011 Trips	2015 Trips	2035 Trips
HBW Trips	197,900	204,300	231,500
Change from 2011	n/a	3.2%	17.0%

The MWCOG trip tables were reviewed more closely to determine major destinations for HBW trips from the I-95 portion of Fairfax County. Specifically, trip interaction with downtown Washington, D.C., Arlington, Alexandria and the Tysons Corner area were reviewed. HBW trips from the Fairfax County portion of the I-95 corridor to downtown D.C., Arlington and Alexandria are anticipated to grow by 14 percent between 2015 and 2035, with almost 120,000 HBW trips by 2035. HBW trips to/from Tysons Corner are anticipated to grow by 36 percent to almost 8,500 trips.

Total HBW trip generation estimated for the I-95 portion of the East Prince William County area from the MWCOG model is noted below in **Table 4-2**:

Table 4-2: Prince William County (I-95 Corridor Only) Daily Home-Based Work Trip Projections

	2011 Trips	2015 Trips	2035 Trips
HBW Trips	165,900	178,700	223,600
Change from 2011	n/a	7.7%	34.8%

The MWCOG trip tables were reviewed more closely to determine major destinations for HBW trips from East Prince William County. HBW trips from East Prince William County to downtown Washington, D.C., Arlington and Alexandria are anticipated to grown by 5 percent between 2015 and 2035 to over 36,000 trips by 2035. HBW trips to/from Tysons Corner are anticipated to grow by more than 80 percent to 4,500 trips by 2035.

4.2.2 Southern Corridor Home-Based Work Trip Projections

The MWCOG model includes traffic analysis zones in Stafford County, Spotsylvania County and the City of Fredericksburg. HBW trips that are generated in these three areas are anticipated to increase by more than 12 percent between 2011 and 2015, and are expected to grow by 68 percent between 2011 and 2035. Many of these new trips are expected to travel along I-95 to employment destinations at the

north end of the corridor. HBW trips from the south end of the corridor to downtown Washington, D.C., Arlington and Alexandria are anticipated to more than double between 2015 and 2035.

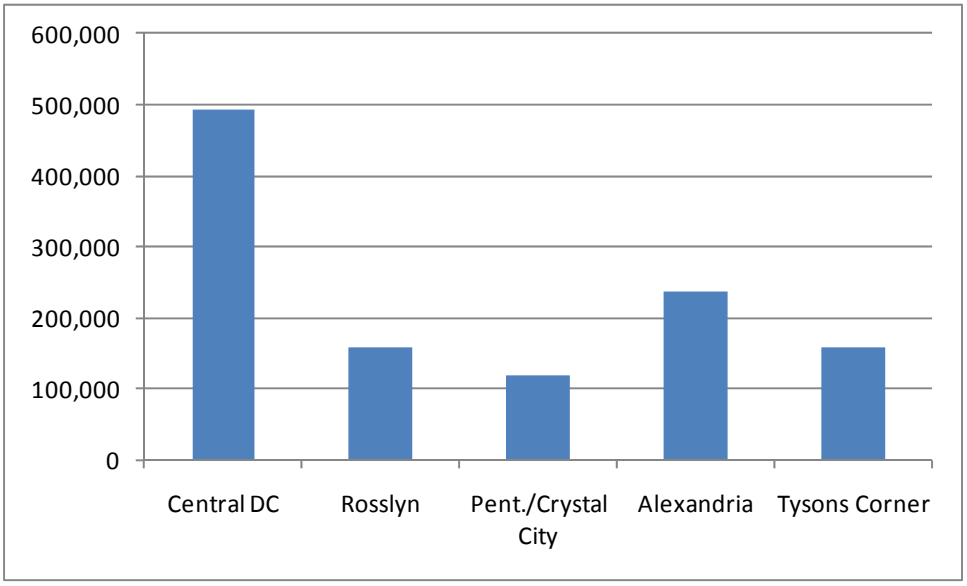
4.2.3 Home-Based Work Trip Destination Projections

The central area of Washington, D.C remains the highest attractor of HBW trips in the region, with about 500,000 daily HBW trips. Within Washington, D.C., the area south of the Mall (including the Navy Yard area) is anticipated to see an 11 percent growth in HBW trips between 2015 and 2035 (to over 200,000 daily HBW trips), while HBW trips in the downtown Washington, D.C. area is anticipated to remain relatively unchanged (almost 300,000 daily HBW trips).

The Arlington and Alexandria areas are anticipated to have higher percentage increases in HBW trip travel than the central area of Washington, D.C., but will remain well below in terms of total trips. Within Arlington, the Rosslyn/Wilson Blvd. corridor has the highest concentration and number of HBW trips. The total number of HBW person trips going to/from this area is anticipated to grow by 12 percent between 2015 and 2035 to 160,000 daily HBW trips. HBW trips to/from the Pentagon/Crystal City area are anticipated to grow at a higher rate (16%), but still remain lower than the Rosslyn area in terms of total trips (120,000 daily HBW trips). Within Alexandria, the Mark Center is anticipated to see a significant increase in HBW trips, due in part to the relocation of 6,400 Army personnel to this site as part of the Base Realignment and Closure Act (BRAC).

The Tysons Corner area is the other major employment center that attracts a large number of I-95 trips. The MWCOG model reflects a 28 percent increase in total HBW trips to/from the Tysons Corner area, to over 150,000 daily HBW person trips. Figure 4-3 illustrates overall HBW trips to and from these major employment centers.

Figure 4-3: HBW Trips at Major Employment Areas



5.0 Existing Transit Service Providers

This section documents the primary transit service providers operating in the corridor along the redefined I-95 HOT/HOV Lanes project. Transit service providers in the I-95 corridor consist of:

- Fairfax Connector
- Washington Metropolitan Area Transit Authority (WMATA)
- Potomac and Rappahannock Transportation Commission (PRTC)
- FREDericksburg Regional Transit (FRED)
- Quick's Bus Company
- Martz Group
- Virginia Railway Express (VRE)

Quick's and Martz are private bus companies; the other five are public transit providers. Following are descriptions of each transit service provider, including descriptions of the transit services each provider operates in the I-95 HOT/HOV Lanes corridor.

5.1 Fairfax Connector

The Fairfax Connector routes that operate in the I-95 HOT/HOV Lanes corridor serve the Franconia-Springfield Metro & VRE Station, with some routes operating all-day, and others operating as peak period "feeder routes" to and from the station. There are only two routes that operate on I-95 (Routes 171 and 380-D), with only one of those routes (380-D) providing service on I-395 to/from the Pentagon.

Base fares for Fairfax Connector routes are $1.50 with a SmarTrip card, $1.70 cash. Metrorail to bus transfers are $1.00 with a SmarTrip card, $1.70 cash. Fares for the 380-D are $5.00 with a SmarTrip card and $7.00 cash. Metrorail to bus transfers for Route 380-D are $4.50 with a SmarTrip card and $5.00 cash.

Following is a general description of each Fairfax Connector route that operates in the corridor (route descriptions reflect service that was in place in spring/summer 2011).

Route 171: Richmond Highway Line - This route provides service generally along Hwy. 1, Fairfax County Parkway, Telegraph Road and Pohick Road to the Lorton VRE Station. This route then continues with service to the Lorton park-and-ride lot, and then operates as an express route along I-95 to the Franconia-Springfield Metro & VRE Station. Weekday and weekend service frequencies are generally 30-minutes all-day.

Routes 231/232: Kingstowne Circulator – This combination of routes provides clockwise and counter-clockwise service between the Franconia-Springfield Metro & VRE Station and the Van Dorn Metro Station. Routes 231/232 operate weekdays in the peak periods only at 30-minute service frequencies.

Route 301: Telegraph Road Line - This route provides service between the Franconia-Springfield VRE & Metro Station and the Huntington Station, primarily along Telegraph Road, The Parkway, S. Kings Highway and Hayfield Road. Route 301 operates on weekdays in the peak periods only (both directions) at 30-minute service frequencies.

Route 304: Saratoga Line - This route operates primarily along Rolling Road, Alban Road and Backlick Road to the Franconia-Springfield Metro & VRE Station. Route 304 operates weekdays only in the peak periods. Morning service is one-direction towards Franconia-Springfield Metro & VRE Station at 30-minute frequencies. Afternoon service is from Franconia-Springfield Metro & VRE Station at 30-minute frequencies.

Route 305: Newington Forest Line - This route provides service primarily along Fairfax County Parkway and Franconia-Springfield Parkway to the Franconia-Springfield Metro & VRE Stations. This route includes stops at the Sydenstricker and Gambrill Road park-and-ride lots. Route 305 operates peak periods only on weekdays, at 30-minute frequencies. Morning trips operate inbound only, afternoon trips operate outbound only.

Route 307: Laurel Hill/Lorton Line - This route provides feeder service to the Lorton VRE Station. This route includes a stop at the Lorton park-and-ride lot. Route 307 operates weekdays in the peak periods only at 30-minute service frequencies. Service is provided in both directions.

Route 310: Franconia Road/Rolling Valley Line - This route provides service primarily along Old Keene Mill Road and Franconia Road, from Rolling Valley park-and-ride to Huntington Metro Station, with a mid-route stop at the Franconia-Springfield Metro & VRE Station. Service frequencies are generally 30 minutes in the peak period, 60 minutes in the midday period, and 60 minutes on weekends.

Routes 321/322: Greater Springfield Circulator – This combination of routes provide clockwise and counter-clockwise service in the Springfield area. The southern end of this circular alignment is anchored at the Franconia-Springfield Metro & VRE Station. The northern end of this alignment goes as far north as Edsall Road and the Van Dorn Street Metro Station. Weekday service frequencies are 30-minute peak/60-minute midday, and weekend service frequencies are 60 minutes all-day.

Routes 331/332: I-95 Circulator – This combination of routes provide clockwise and counter-clockwise service along the I-95 corridor, primarily serving Loisdale Road (on the east side of I-95) and Backlick Road (on the west side of I-95. This route includes service to the Springfield Mall and the Backlick Road park-and-ride lot. The northern end of this route is anchored at the Franconia-Springfield Metro & VRE Station. Routes 331/332 operate at 30-minute peak and 60-minute midday service frequencies, weekdays only.

Route 380-D: Franconia-Springfield Pentagon Express Route - This route operated between Franconia-Springfield Metro and the Pentagon as Route 380 until November 23, 2009, at which time it was re-designated as the 380-D and the southern terminus was shifted due to the start of a major rehabilitation project on the parking structure at the Metro Station. The 380-D operates out of the Gambrill and Backlick North park-and-ride lots. This route operates in the peak periods only at 15-20-minute service frequencies (peak direction service only). Ridership data provided by the Fairfax Connector indicates that about 70 to 75 percent of total daily ridership uses the Gambrill Road park-and-ride lot, with remaining riders using the Backlick North park-and-ride lot. Ridecheck counts indicate that there are rarely more than 25 passengers on any particular bus trip.

Routes 401/402: Backlick/Gallows Road – This combination of routes provide northbound and southbound service between the Franconia-Springfield Metro & VRE Station and Tysons Corner. These routes operate as local route service, and do not operate on any freeways. Routes 401/402 operate at 15-20-minute frequencies in the peak periods, and 30 minutes in the midday and weekend periods.

Table 5-1 presents a summary or route service characteristics, and current average weekday ridership volumes. **Figure 5-1** illustrates Fairfax Connector route alignments.

Table 5-1
Fairfax Connector – Corridor Routes

Route	Route Name	Weekday Freq. (peak/midday)	Avg. Weekday Rev.-Hours	Avg. Weekday Ridership	Riders per Rev.-Hour
171	Richmond Highway	30 min./30 min.	134.5	3,099	23.0
304	Saratoga	30 min./--	13.23	170	12.9
305	Newington	30 min./--	14.4	127	8.8
307	Laurel Hill/Lorton	30 min./--	19.39	25	1.3
310	Franconia/Rolling Valley	30 min./60 min.	80.68	1,360	16.9
321/322	Springfield Circ.	30 min./60 min.	87.69	1,500	17.1
331/332	I-95 Circulator	30 min./60 min.	62.22	508	8.2
380-D	F-S/Pentagon Express	15-20 min./--	22.29	278	26.5
401/402	Backlick/Gallows Road	15-20 min./30 min.	186.64	3,700	19.8

Not included in table are figures for Routes 231/232 and 301.

5.2 WMATA

There is one Metrorail Station in the corridor – the Franconia-Springfield Station, located along Franconia-Springfield Parkway, just east of I-95 (south of the Springfield Mall). This station is the end-of-line station for the Blue Line. There are 5,069 parking spaces at this station, and the daily parking cost is $4.50. Carsharing (through ZipCar) is also available at this station. Blue line weekday train frequencies are 6 minutes in the peak periods and 12 minutes in the midday.

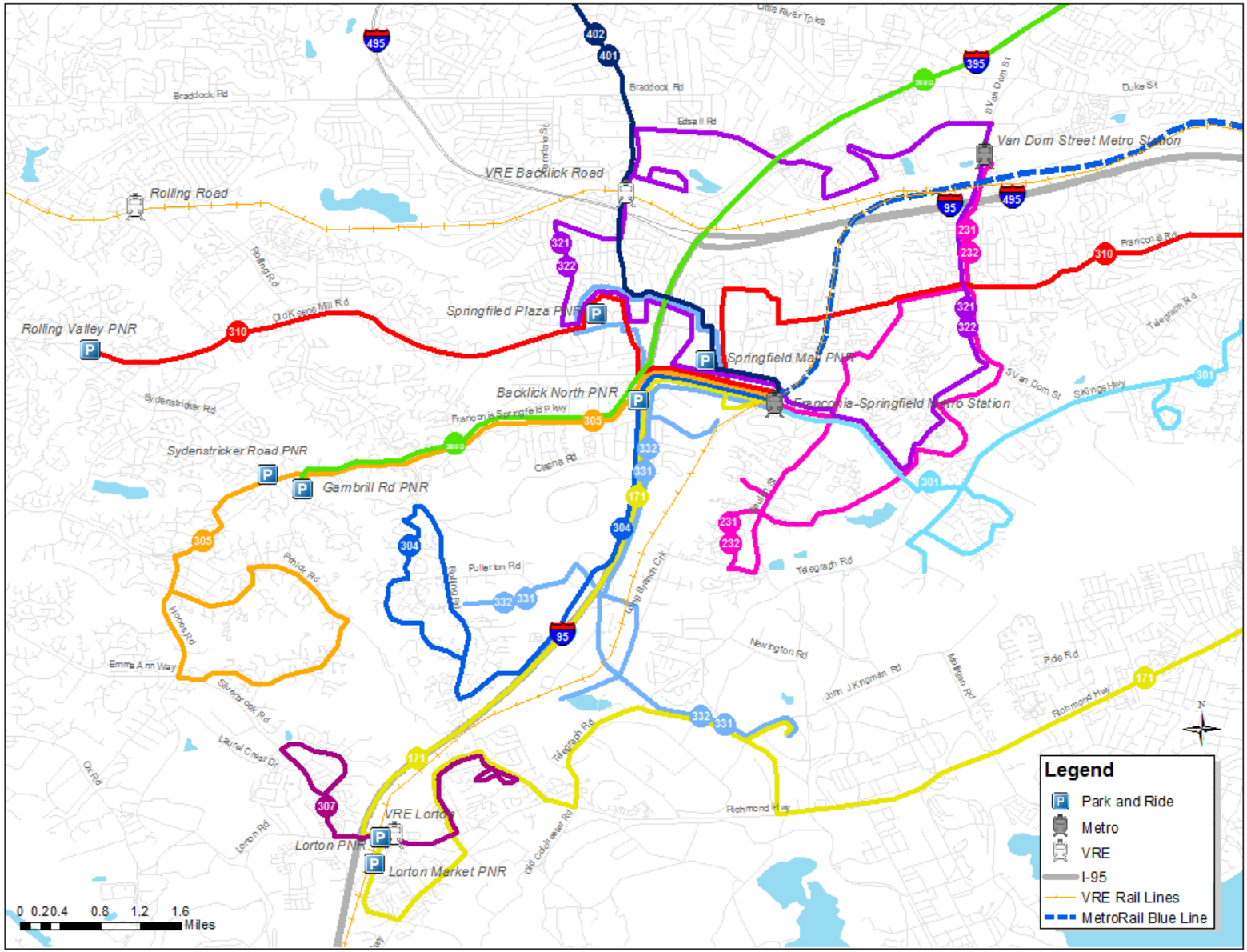
Route 18 is the primary Metrobus route that serves the I-95 corridor. Metrobus operates the following Route 18 lines:

Route 18E/F – These two lines operate primarily along Backlick Road to Edsall Road to the Pentagon via I-395, with 18E getting on I-395 at Edsall Road, and I8F getting on I-395 at Duke Street. Routes 18E/F operate in the peak periods at about 30-minute frequencies. Route 18E provides peak direction service (i.e., inbound in the a.m. and outbound in the p.m.). Route 18F provides reverse peak direction service (i.e., outbound in the a.m. and inbound in the p.m.). The combined daily ridership on 18E/F is approximately 280 passenger trips. Maximum passenger loads are typically in the teens.

Route 18G/H/J – These lines provide peak period service from the Old Keene Mill Road corridor to the Pentagon via I-95/I-395. Routes 18G/H provide peak direction service at 10-20-minute service frequencies. Route 18J provides reverse peak direction service at about 30-minute service frequencies. Maximum passenger loads on Routes G/H (the peak direction service) are typically around 30-35 passengers per trip.

Route 18P – This line provides peak period service from the Burke Centre area to the Pentagon via I-95/I-395. This route gets on/off I-395 at Old Keene Mill Road. This route pattern operates in the peak direction only at 15-30-minute service frequencies. Route 18P averages over 520 passenger trips a day, with maximum passenger loads averaging 18-20 passengers per trip.

Figure 5-1:
Fairfax Connector Routes in I-95 Corridor



Route 18R/S – This line provides peak period service from the Burke Centre area to the Franconia-Springfield Metrorail station via Franconia-Springfield Parkway. These route patterns operate at approximately 15-minute service frequencies in the peak periods only.

Routes S80 and S90 – In addition to the Route 18 lines, WMATA operates Routes S80 and S91 (Springfield Circulator) for the Transportation Association of Greater Springfield (TAGS). These circulator routes are anchored at the Franconia-Springfield Metrorail station, and provide frequent service in this area. Route S80 operates between Metro Park and the Hilton Springfield at 15-minute frequencies throughout the day. Route S91 provides supplemental service between the Metrorail station and Springfield Mall at 15-minute frequencies in the peak periods only. Small "body-on-chassis" buses are used on these routes.

Figure 5-2 illustrates WMATA Metrobus routes operating in the I-95 corridor.

In addition to bus services described above, it is important to note that the Franconia-Springfield Metrorail station is located in the I-95 corridor. This station is the end-of-line station for the Blue Line. Average weekday ridership has historically been around 9,500 a day. There are approximately 5,120 parking spaces at this station and eight bus bays. Bus bay activity and parking lot utilization at this station is described later in this Technical Memorandum.

5.3 Potomac and Rappahannock Transportation Commission (PRTC)

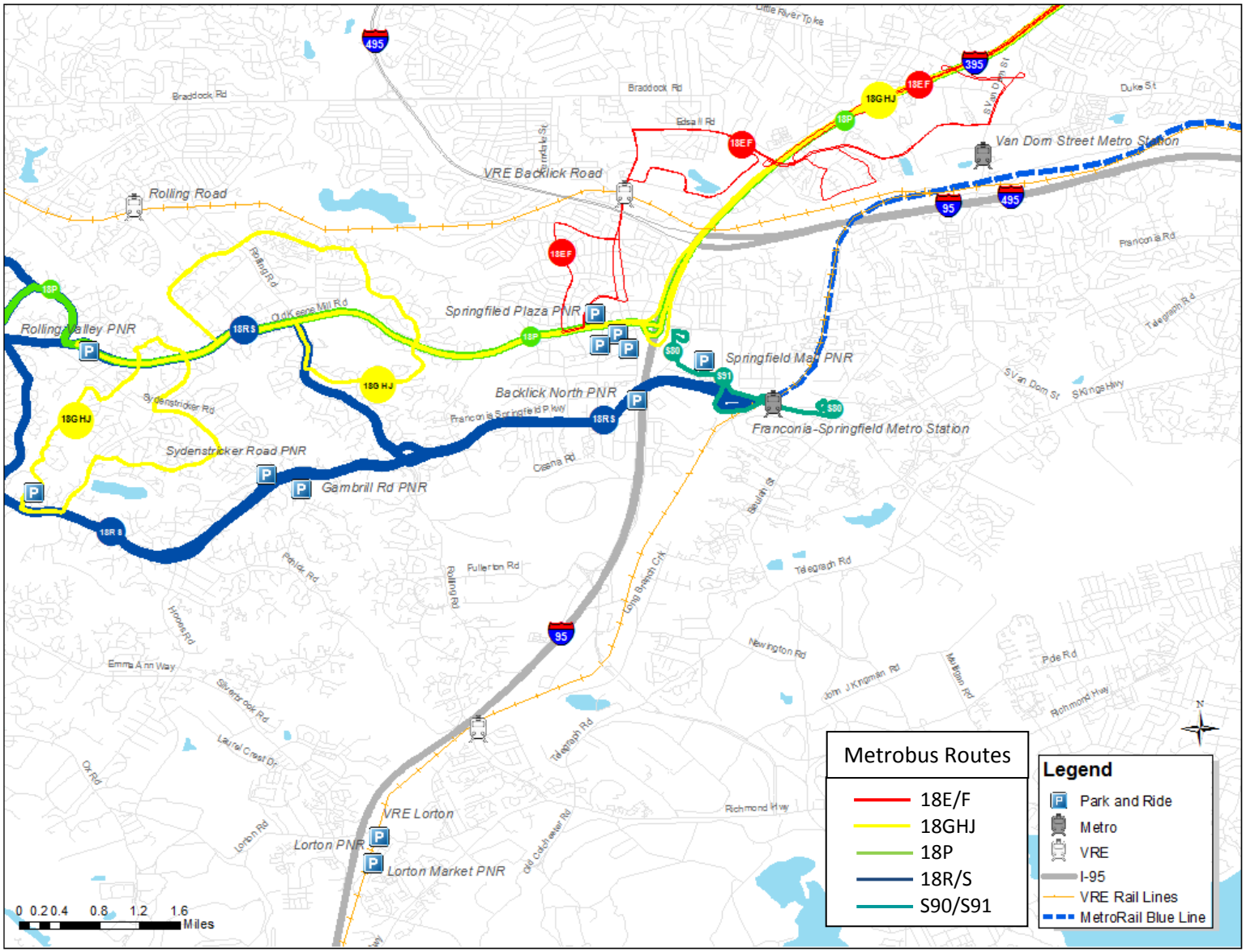
The Potomac and Rappahannock Transportation Commission (PRTC) offers a comprehensive network of commuter and local bus services in Prince William County and the Cities of Manassas and Manassas Park, as well as a free ridematching service. In addition, PRTC operates VRE in partnership with the Northern Virginia Transportation Commission (NVTC).

OmniRide is PRTC's commuter bus service, providing comfortable and efficient commuter bus service between Prince William County and Washington, D.C. and Northern Virginia. OmniRide service is provided using principally 57-seat over-the-road coaches. The typical patron is a choice rider and has access to a private vehicle.

PRTC operates 10 commuter bus routes in the I-95 corridor from the Woodbridge, Dale City, Lake Ridge, Montclair, and Dumfries communities. Their destinations include downtown Washington, D.C., the Pentagon, Crystal City, Rosslyn/Ballston, Capitol Hill, the Navy Yard area and Tyson's Corner. I-95 commuter bus route characteristics in FY 2010 are listed in **Table 5-2** and shown in **Figure 5-3**. Buses operate only on weekdays in the I-95 corridor with service inbound to Washington/Northern Virginia in the mornings and outbound in the evenings. In addition, over half of the routes have outbound midday service. Service frequency varies by route from one trip to eight trips per hour. The routes circulate through their origin communities, with stops at multiple commuter lots before entering I-95. Over 5,800 passenger trips are on I-95 corridor OmniRide routes.

Metro Direct is a commute and reverse-commute bus service that provides stops at Metrorail stations. As shown in **Table 5-2**, PRTC operates one Metro Direct route in the I-95 corridor from Lake Ridge to the Franconia-Springfield Metro station. This route operates all-day in both directions. Over 800 passenger trips are on this corridor's Metro Direct route.

Figure 5-2:
WMATA Bus Routes in I-95 Corridor



The base one-way fares for OmniRide routes are $5.25 with a SmarTrip card or $7.00 cash. The base one-way fare for Metro Direct routes is $2.65 with a SmarTrip card or $3.30 cash. VRE monthly pass holders transfer free from VRE to PRTC bus routes, but must pay the PRTC bus fare when riding a bus to a VRE station. SmarTrip card holders transferring between an OmniRide or Metro Direct bus and another regional bus system receive transfer credit. However, no transfer credit is given when transferring between OmniRide or Metro Direct buses and Metrorail.

Table 5-2
PRTC – Corridor Routes Characteristics in 2010

Route Type	Route Name	Weekday Trips (AM/PM/off-peak)	Avg. Weekday Rev.-Hours	Avg. Weekday Ridership	Riders per Rev.-Hour
OmniRide	Dale City to Washington	21/22/3	66.8	1,704	25.5
OmniRide	Dale City to Pentagon and Crystal City	8/7/3	19.5	558	28.7
OmniRide	Dale City to Pentagon and Washington Navy Yard	5/6/4	15.9	448	28.1
OmniRide	Lake Ridge to Washington	9/14/5	40.6	864	21.3
OmniRide	Lake Ridge to Pentagon and Crystal City	6/8/4	18.5	502	27.1
OmniRide	Capitol Hill	1/1/--	2.9	67	23.5
OmniRide	Montclair	11/11/3	37.0	953	25.8
OmniRide	Route 1/South Route 1	5/7/3	16.4	334	20.4
OmniRide	Rosslyn/Ballston	4/4/--	10.7	326	30.4
OmniRide	Tysons Express	4/5/--	12.7	65*	5.2*
Metro Direct	Prince William	4/4/13	27.7	828	29.9

** As of May 2011, average weekday ridership on the Tysons Express route had risen to 149, for riders per revenue-hour of 11.6*

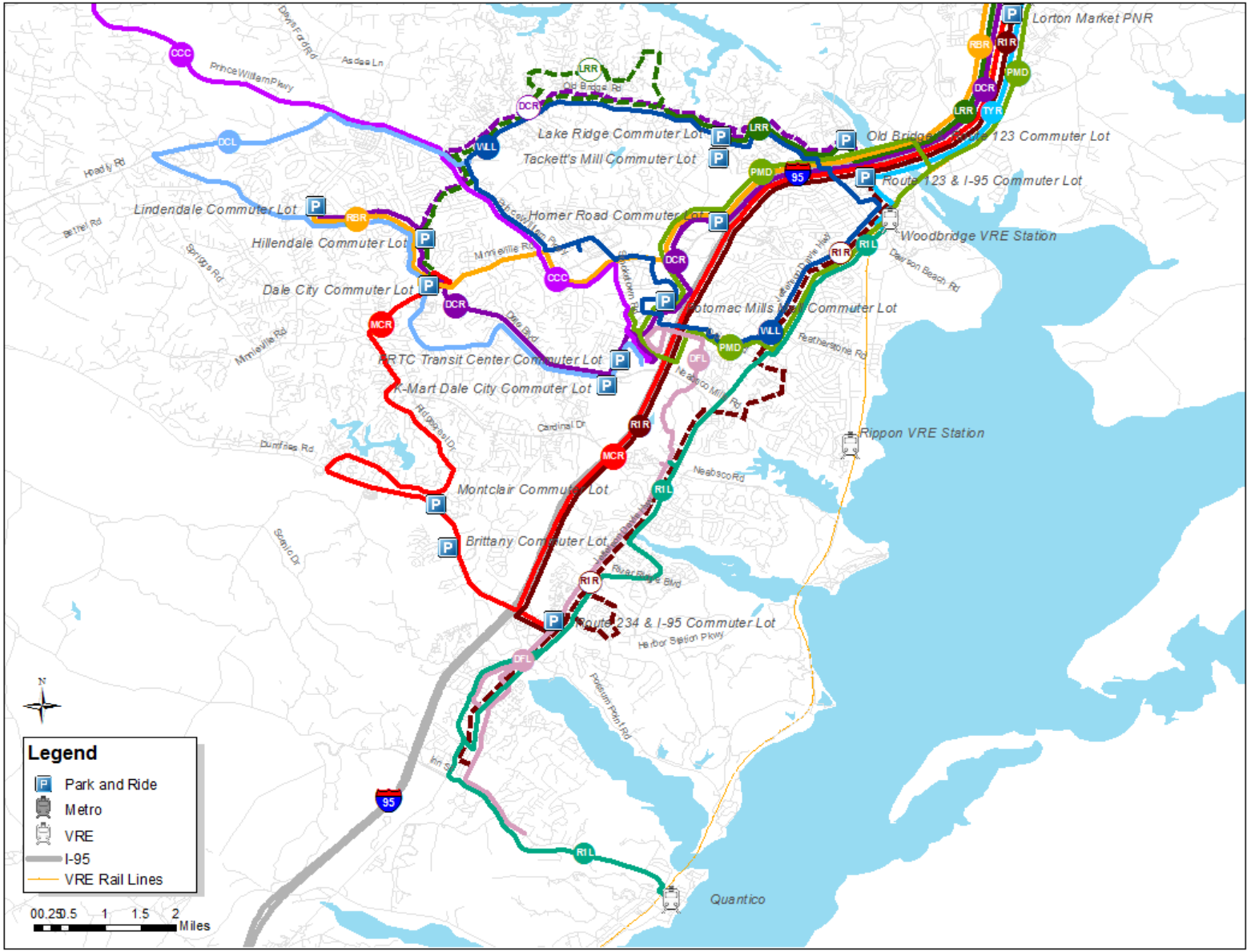
Following is a general description of each route, as of May 23, 2011 when PRTC's spring service changes went into effect.

Dale City to Washington OmniRide – This route provides connecting service between Dale City and Downtown Washington, D.C. The route operates an extended service span on weekdays, with peak period service approximately every 7 to 8 minutes. It generally operates in Prince William County southeast on Dale Boulevard, north on Gideon Drive, Potomac Mills Road, and Telegraph Road and northeast on Prince William Parkway, serving five commuter lots, as listed below.

Taking the average of all trips on a typical weekday morning in April 2011, boardings at each of the commuter lots were as follows:

- Lindendale 2
- Dale City 6
- PRTC Transit Center 9
- Potomac Mills 7
- Horner Road 23

Figure 5-3:
PRTC Bus Routes in I-95 Corridor



On average, one additional passenger boarded at other locations along the route, for an average load at Horner Road (just before entering I-95) of 47 passengers. The seated capacity of the OmniRide bus was exceeded at the Horner Road Commuter Lot on five out of the 21 trips.

From the Horner Road Commuter Lot, the route has direct ramp access to the I-95 HOV lanes and travels on I-95 and I-395 non-stop using the HOV lanes to their end north of Eads Street, then in general purpose lanes to the 14th Street exit. The route continues north on 14th Street, west on I Street, south on 19th Street and then northwest on Virginia Avenue to end at the State Department.

Dale City to Pentagon and Crystal City OmniRide – This route provides connecting service between Dale City and the Pentagon and Crystal City. The route operates inbound in the morning peak and outbound all afternoon and early evening. Peak period service operates approximately every 30 minutes. In Prince William County, it operates the same alignment as the Dale City to Washington route, serving five commuter lots, as listed below.

Taking the average of all trips on a typical weekday morning in April 2011, boardings at each of the commuter lots were as follows:

- Lindendale 3
- Dale City 6
- PRTC Transit Center 6
- Potomac Mills 4
- Horner Road 25

On average, one additional passenger boarded at other locations along the route, for an average load at Horner Road (just before entering I-95) of 44 passengers.

From the Horner Road Commuter Lot, the route has direct ramp access to the I-95 HOV lanes and travels non-stop on I-95 and I-395 in the HOV lanes to the HOV exit ramps at Eads Street to the Pentagon. From the Pentagon the route generally travels south on Eads and Clark streets, east on 26th Street, north on Crystal Drive, and west on 12th Street ending at Old Jefferson Davis Highway.

Dale City to Washington Navy Yard OmniRide – This route provides connecting service between Dale City and the Pentagon and the Washington Navy Yard. The route operates inbound in the morning peak and outbound all afternoon and early evening. Peak period service operates approximately every 30 minutes. In Prince William County, it operates the same alignment as the Dale City to Washington route, serving five commuter lots, as listed below.

Taking the average of all trips on a typical weekday morning in April 2011, boardings at each of the commuter lots were as follows:

- Lindendale 2
- Dale City 9
- PRTC Transit Center 6
- Potomac Mills 11
- Horner Road 19

On average, one additional passenger boarded at other locations along the route, for a load at Horner Road (just before entering I-95) of 48 passengers.

From the Horner Road Commuter Lot, the route has direct ramp access to the I-95 HOV lanes and travels non-stop on I-95 and I-395 in the HOV lanes to the HOV exit ramps at Eads Street to the Pentagon. From the Pentagon the route enters I-395 and travels north to the 14th Street exit. The route continues north on 14th Street, east on C Street, south on 12th Street, southeast on Maine Avenue, east on M Street, then south on 11th Street, east on O Street and north on 12th Street, ending at the Maritime Plaza at the Navy Yard.

Lake Ridge to Washington OmniRide – This route provides connecting service between Lake Ridge and Downtown Washington, D.C. The route operates an extended service span on weekdays, with peak period service approximately every 10 to 20 minutes. It generally operates in Prince William County north on Smoketown Road and Griffith Avenue, east on Cotton Mill Drive, south on Mohican Road, east on Seminole Road, north on Antietam Road, east on Deepford Drive, south on Oakwood Drive, southeast on Old Bridge Road, south on Route 123 and north on Annapolis Way, serving five commuter lots, as listed below.

For this route pattern, taking the average of all trips on a typical weekday morning in April 2011, boardings at each of the commuter lots were as follows:

- Festival at Old Bridge 4
- Tacketts Mill 6
- Lake Ridge 3
- Old Bridge and Route 123 9
- Route 123 and I-95 11

On average, five additional passengers boarded at other locations along the route, for a load at Route 123 and I-95 (just before entering I-95) of 38 passengers.

A second route pattern is also operated for the last two trips of the morning, serving both Lake Ridge and Dale City. It generally operates in Prince William County north on Dale Boulevard, northeast on Hillendale Drive, northwest on Prince William Parkway, east on Old Bridge Road and south on Route 123, serving five commuter lots as listed below.

For this secondary route pattern, taking the average of the two trips on a typical weekday morning in April 2011, boardings at each of the commuter lots were as follows:

- Dale City 5
- Tacketts Mill and Lake Ridge 3
- Old Bridge and Route 123 6
- Route 123 and I-95 17

On average, three additional passengers boarded at other locations along the route, for a load at Route 123 and I-95 (just before entering I-95) of 33 passengers.

From the Route 123 and I-95 Commuter Lot, the route has direct ramp access to the I-95 HOV lanes via Annapolis Way and Route 123 and travels on I-95 and I-395 non-stop using the HOV lanes to their end north of Eads Street, then in general purpose lanes to the 14th Street exit. In Washington, D.C., the route follows the same alignment as the Dale City to Washington route, ending at the State Department.

Lake Ridge to Pentagon and Crystal City OmniRide – This route provides connecting service between Lake Ridge and the Pentagon and Crystal City. The route operates inbound in the morning peak and outbound all afternoon and early evening. Peak period service operates approximately every 10 to 20 minutes. In Prince William County, the route follows the same alignment as the Lake Ridge to Washington route, serving five commuter lots, as listed below.

Taking the average of all trips on a typical weekday morning in April 2011, boardings at each of the commuter lots were as follows:

- Festival at Old Bridge 2
- Tacketts Mill 11
- Lake Ridge 8
- Old Bridge and Route 123 6
- Route 123 and I-95 11

On average, seven additional passengers boarded at other locations along the route, for a load at Route 123 and I-95 (just before entering I-95) of 43 passengers.

From the Route 123 and I-95 Commuter Lot, the route has direct ramp access to the I-95 HOV lanes via Annapolis Way and Route 123 and travels in the I-95 and I-395 HOV lanes non-stop to the HOV exit ramps at Eads Street to the Pentagon. From the Pentagon, the route follows the same alignment as the Dale City to Pentagon and Crystal City route, ending at Old Jefferson Davis Highway.

Capitol Hill OmniRide – This route provides connecting service between Dale City, Lake Ridge and Capitol Hill. It operates only one trip in the morning and one trip in the afternoon. It generally operates in Prince William County from the Dale City Commuter Lot north on Dale Boulevard, northeast on Hillendale Drive, northwest on Prince William Parkway, northeast on Old Bridge Road and south on Route 123, serving four commuter lots, as listed below.

On a typical weekday morning in April 2011, boardings at each of the commuter lots were as follows:

- Dale City 2
- Tacketts Mill and Lake Ridge 17
- Old Bridge and Route 123 12

An additional six passengers boarded at other locations along the route, for a load at Old Bridge and Route 123 (just before entering I-95) of 37 passengers.

From the Old Bridge and Route 123 Commuter Lot, the route has direct ramp access to the I-95 HOV lanes via Route 123 and travels on I-95 and I-395 non-stop using the HOV lanes to their end north of Eads Street, then in general purpose lanes to the 14th Street exit. The route continues north on 14th Street, east on C Street, north on 12th Street, east on Constitution Avenue, southeast on Pennsylvania Avenue, makes a loop north on 3rd Street, east on E Street, south on N. Capitol Street and southwest on Louisiana Avenue back to 3rd Street. The route continues south on 3rd Street, and west on Independence Avenue, ending at 7th Street.

Montclair OmniRide – This route provides connecting service between Montclair and the Pentagon and Downtown Washington, D.C. The route operates inbound in the morning peak and outbound all afternoon and early evening. Peak period service operates approximately every 15 minutes. It generally

operates in Prince William County from the Dale City Commuter Lot southwest on Minnieville Road, southeast on Cardinal west on Minnieville, south on Cardinal Drive, south on Waterway Drive through the Montclair community and southeast on Route 234 (Dumfries Road), serving three commuter lots, as listed below.

Taking the average of all trips on a typical weekday morning in April 2011, boardings at each of the commuter lots were as follows:

- Dale City 5
- Brittany 6
- Route 234 and Route 1 25

On average, an additional 10 passengers boarded at other locations along the route, for a load at Route 234 and Route 1 (just before entering I-95) of 45 passengers.

From the Route 234 and Route 1 Commuter Lot, the route enters the general purpose I-95 travel lanes until reaching the I-95 HOV access ramps just south of the Cardinal Drive overpass. It then travels non-stop in the I-95 and I-395 HOV lanes to the HOV exit ramps at Eads Street to the Pentagon. From the Pentagon, the route enters I-395 and travels north to the 14th Street exit. The route continues north on 14th Street, east on H Street, south on 11th Street, southeast on Pennsylvania Avenue, south on 4th Street, west on Independence Avenue, south on 7th Street, and west on D Street, ending at 9th Street.

Route 1/South Route 1 OmniRide – This route operates two distinct route patterns. Route 1 provides connecting service between Triangle, Dumfries and Woodbridge and the Pentagon and Downtown Washington, D.C. South Route 1 provides connecting service between Woodbridge and the Pentagon and Downtown Washington, D.C.

Route 1 operates only one trip in the morning and one in the afternoon. In the morning, it generally operates in Prince William County from Triangle northeast on Route 1, southeast on River Ridge Boulevard, northwest on Powell's Creek Boulevard, northeast on Route 1 and northwest on Route 123, serving the Route 123 and I-95 Commuter Lot.

On a typical weekday morning in April 2011, boardings at the commuter lot were as follows:

- Route 123 and I-95 4

An additional 19 passengers boarded at other locations along the route, for a load at Route 123 and I-95 (just before entering I-95) of 23 passengers.

From the Route 123 and I-95 Commuter Lot, the route travels via Annapolis Way and Route 123 to the direct access ramp to the I-95 HOV lanes and travels non-stop in the I-95 and I-395 HOV lanes to the HOV exit ramps at Eads Street to the Pentagon. From the Pentagon the route enters I-395 and travels north to the 14th Street exit. The route continues north on 14th Street, west on I Street, south on 19th Street and then northwest on Virginia Avenue to end at the State Department. In the afternoon, after serving the Pentagon, the route travels south in the I-395 and I-95 HOV lanes, exiting and merging into general purpose lanes just south of the Cardinal Drive overpass and exiting I-95 at Joplin Road and traveling southeast on Joplin Road to Triangle. It then continues via the morning routing north to the Route 123 and I-95 Commuter Lot.

South Route 1 operates inbound in the morning peak and outbound all afternoon and early evening. Peak period service operates approximately every 50 minutes. It generally operates in Prince William County from Powell's Creek Boulevard southwest on Route 1, southeast on River Heritage Boulevard, southwest on Kirby Drive, southeast on Clancy Drive, southwest on River Ridge Boulevard, northwest on Wayside Drive, southwest on Route 1 and northwest on Route 234, serving the Route 234 and Route 1 Commuter Lot.

Taking the average of all trips on a typical weekday morning in April 2011, boardings at each of the commuter lots were as follows:

- Route 234 and Route 1 21

On average, an additional 23 passengers boarded at other locations along the route, for a load at Route 234 and Route 1 (just before entering I-95) of 44 passengers.

From the Route 234 and Route 1 Commuter Lot, the route enters the general purpose I-95 travel lanes until reaching the I-95 HOV access ramps just south of the Cardinal Drive overpass. It then travels non-stop in the I-95 and I-395 HOV lanes to the HOV exit ramps at Eads Street to the Pentagon. From the Pentagon, the route enters I-395 and travels north to the 14th Street exit. In Washington, D.C., the route follows the same alignment as the Montclair route, ending at the D street and 9th Street.

Rosslyn/Ballston OmniRide – This route provides connecting service between Dale City, Woodbridge and the Pentagon and Rosslyn/Ballston. The route operates in the morning and afternoon peak periods only, with service approximately every 40 minutes. It generally operates in Prince William County southeast on Dale Boulevard, northeast on Minnieville Road and Prince William Parkway, and north on Telegraph Road, serving four commuter lots, as listed below.

Taking the average of all trips on a typical weekday morning in April 2011, boardings at each of the commuter lots were as follows:

- Lindendale 10
- Dale City 18
- First Baptist Church 6
- Horner Road 17

On average, the load at Horner Road (just before entering I-95) was 51 passengers. The seated capacity of the OmniRide bus was exceeded at the Horner Road Commuter Lot two of the four trips.

From the Horner Road Commuter Lot, the route has direct ramp access to the I-95 HOV lanes and travels non-stop on I-95 and I-395 in the HOV lanes to the HOV exit ramps at Eads Street to the Pentagon. From the Pentagon, the route continues northwest on Route 110, and southwest on Wilson Boulevard and Fairfax Drive, serving four Metro Stations ending at the Ballston Station.

Tysons Express OmniRide – This route provides connecting service between Woodbridge and Tysons Corner. The route operates in the morning and afternoon peak periods only, with service approximately every 40 minutes. It generally operates in Prince William County from the Woodbridge VRE Station northeast on Route 1 and northwest on Route 124, serving the Route 123 and I-95 Commuter Lot.

Taking the average of all trips on a typical weekday morning in April 2011, boardings at each of the commuter lots were as follows:

- Woodbridge VRE 5
- Route 123 and I-95 14

On average, the load at the Route 123 and I-95 Commuter Lot (just before entering I-95) was 19 passengers.

From the Route 123 and I-95 Commuter Lot, the route has direct ramp access to the I-95 HOV lanes via Annapolis Way and Route 123 and travels northeast in the I-95 HOV lanes and northwest on I-495 to the Leesburg Pike exit and into Tysons Corner. It will travel in the I-495 HOV lanes once they are complete. In the morning, it then circulates through Tysons Corner generally traveling northwest on Leesburg Pike, deviating northeast to serve Tysons Corner Center, north on International Drive, northwest on Greensboro Drive, east and south on Spring Hill Road and Jones Branch Westpark Drive, ending at Westpark Drive. In the afternoon, the route begins at Tysons Corner Center, circulates through Tysons Corner, and enters I-495 via Route 123.

Prince William Metro Direct – This route operates in a loop connecting Dale City and Woodbridge and the Franconia-Springfield Metro and VRE Station. The route operates all-day on weekdays approximately every 40 minutes.

In the morning, it generally operates in Prince William County from the PRTC Transit Center north on Telegraph Road and Potomac Mills Road, serving the PRTC Transit Center and Horner Road Commuter Lot.

Taking the average of all trips on a typical weekday morning in April 2011, boardings at each of the commuter lots were as follows:

- PRTC 5
- Potomac Mills 5
- Horner Road 4

On average, an additional 5 passengers boarded at other locations along the route, for a load at Horner Road (just before entering I-95) of 22 passengers. It should also be noted that not all of the boardings at Potomac Mills are related to parking at the commuter lot.

From the Horner Road Commuter Lot, the route has direct ramp access to the I-95 HOV lanes and travels non-stop on I-95 in the HOV lanes to the HOV exit ramps at Franconia-Springfield Parkway, travelling east and exiting to the Franconia-Springfield Metro and VRE Station via Frontier Drive. It returns to Prince William County north on Frontier Drive, west on Franconia-Springfield Parkway, south on Backlick Road, and entering I-95 just south of Fairfax County Parkway. The route exits I-95 and continues southwest on Route 1, west on Opitz Boulevard, and south on Potomac Mill Road to the PRTC Transit Center. In the afternoon, the route operates in the reverse.

5.4 Fredericksburg Regional Transit (FRED)

FREDericksburg Regional Transit (FRED) provides fixed route transit service with deviations to the Fredericksburg Region including the City of Fredericksburg and Spotsylvania, Stafford, Caroline and King George counties. According to 2008 NTD data, FRED's service area is 242 square miles with a population of 113,716. FRED operates 17 local deviated fixed routes, with five routes serving the City of Fredericksburg, three routes serving Spotsylvania County and six routes serving Stafford County. The Stafford County routes include Route D6, which provides shuttle service between the VDOT North and South commuter lots on Garrisonville Road near I-95. The remaining deviated fixed routes serve King George and Caroline counties. In addition to regular fixed route service, FRED provides weekend service for University of Mary Washington students via the Eagle Express, and VRE feeder service to the VRE station in the City of Fredericksburg. Currently, FRED does not provide commuter service, and most of FRED's deviated fixed routes begin service between 7:00 a.m. and 9:00 a.m. and end by 8:30 p.m. Fares on regular local routes are 50 cents, and VRE feeder service is $1.25. The following routes serve Fredericksburg area commuters:

- ***D6-Stafford County Express Route D6 North Commuter Lot to South Commuter Lot:*** This route provides peak period shuttle service between the North Commuter Lot and South Commuter Lot on Garrisonville Road between the hours of 6:30 a.m. and 8:15 a.m. and 4:30 p.m. and 7:15 p.m. In 2009, from January to December, this service had 10,133 riders.
- ***VF1-Idlewild/Cowan Blvd. Fredericksburg VRE service:*** This route provides a.m. and p.m. period VRE feeder service from stops along Cowan Boulevard and the Idlewild community in City of Fredericksburg to the VRE station in Fredericksburg. Service is timed to coordinate with VRE train schedules. From January to December in 2009, this service had 5,821 riders.
- ***VS1-Spotsylvania County VRE Service:*** This service provides VRE feeder service from commuter park and ride locations on Gordon Road and Salem Church Crossing in Spotsylvania County (Route 3) to the VRE Station in City of Fredericksburg. Service is timed to coordinate with VRE train schedules. From January to December in 2009, this route had 31,615 riders.

Figure 5-4 illustrates the existing FRED transit network. Not shown in this is D6 – the shuttle service that is provided between the North and South Commuter Lots on Garrisonville Road. **Figure 5-5** illustrates the two existing feeder routes operated by FRED to the Fredericksburg VRE station.

5.5 Quick's Bus Company

Quick's Bus Company (Quick's) provides commuter service from Spotsylvania and Stafford counties to the Washington, D.C. area on a fleet of MCI/Neoplan motor coaches that can accommodate 47 to 55 passengers. Most of Quick's route patterns provide service to destinations outside of the central Washington, D.C. core. Quick's provides regularly scheduled service to the following commuter lots:

Figure 5-4: FRED Transit System Map

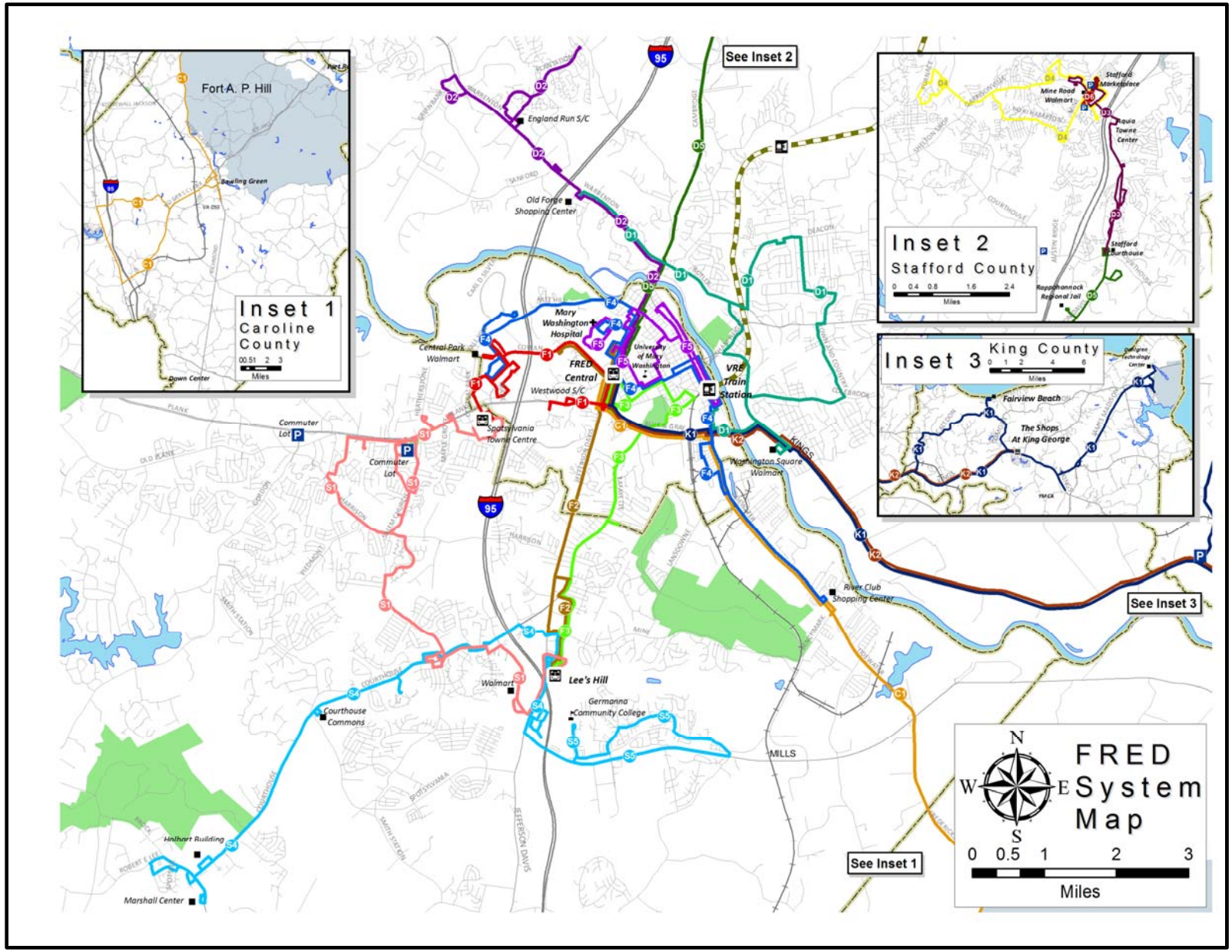


Figure 5-5: FRED-Operated Feeder Routes to Fredericksburg VRE Station

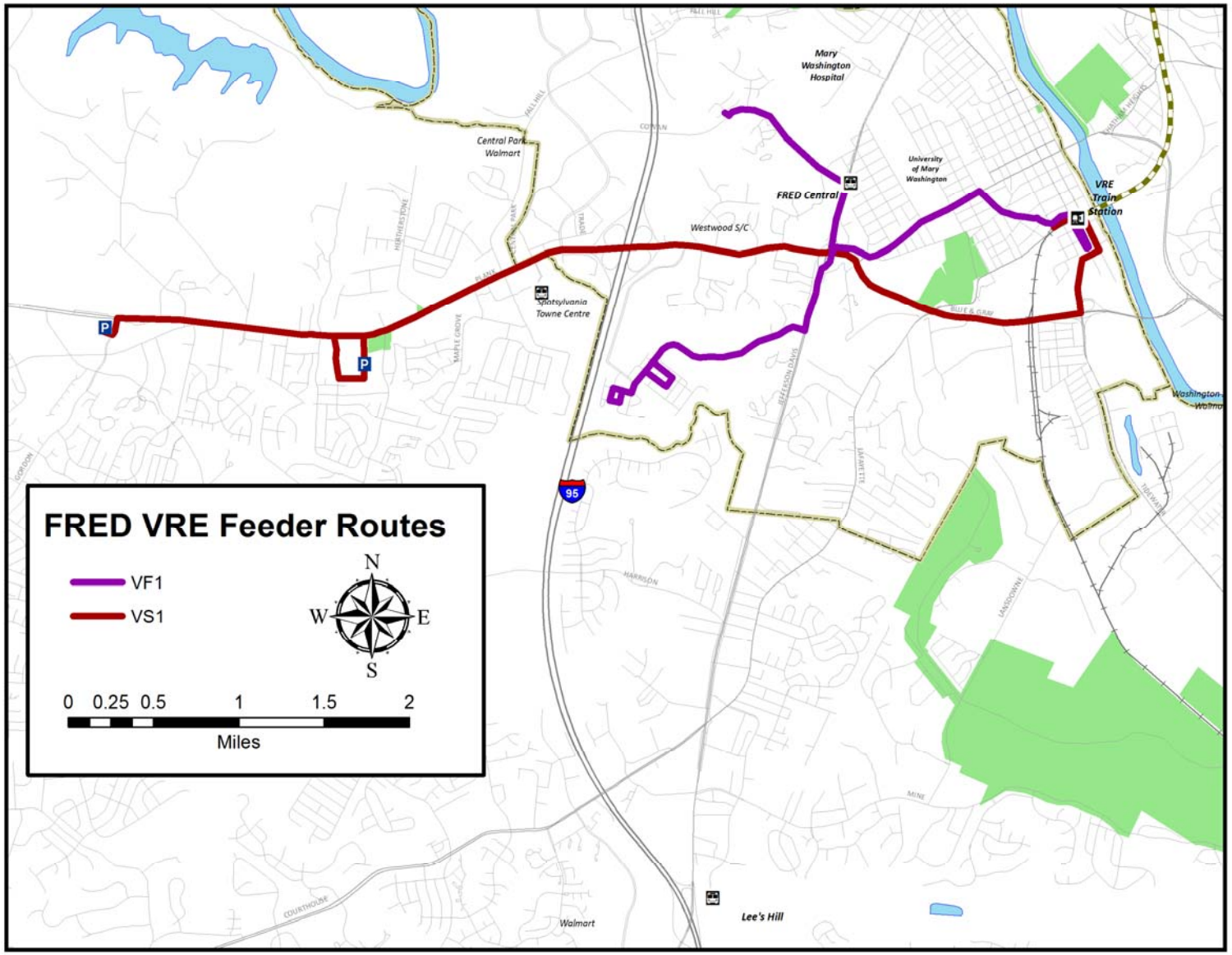


Table 5-3: Commuter Lots Served by Quick's

Commuter Lot	Location
Rt. 17 Commuter Lot	Lot is located on Rt. 17 in Falmouth across from Pizza Hut on the left hand side.
Rt. 630 Commuter Lot	Lot is right off I-95 exit 140 in Stafford.
Rt. 3 (Gordon Road) Commuter Lot	Lot is at the corner of Gordon Road and Rt. 3 West coming from Fredericksburg.
Rt. 3 Old Commuter Lot	Lot is off Route 3 in Fredericksburg, behind the old Ukrops store
Rt. 208 Commuter Lot	Lot is located on Houser Drive, off 208 east of I-95.
Rt. 610 – North Lot	North Lot is located off of Garrisonville Rd. on Staffordborough Blvd., behind the McDonalds (South lot is not served by Quick's

Quick's has the following fares for the regularly scheduled commuter service from Fredericksburg:

- Monthly Tickets for $260.00, Ft. Belvoir only for $200.00;
- Bi-Weekly Tickets for $135.00, Ft. Belvoir only for $110.00;
- Weekly Tickets for $75.00;
- Twenty Punch Tickets for $190.00;
- Round Trip Tickets for $22.00; and
- One Way Tickets for $14.00.

Tickets are purchased directly from the conductor on each commuter motor coach via cash, personal checks, SmartBenefits, SmartBenefits Vouchers, TranBen Checks, and Electronic SmarTrip Cards available at WMATA under the van pool section. Quick's operates 10 commuter routes from Stafford and Spotsylvania counties as described below.

- **Run #1 – Washington Navy Yard Department of Transportation (Assigned Seating):** This route serves the Route 17 Commuter Lot, Route 630 Commuter Lot, M & 2nd Streets, Navy Yard Bldg. 197 and Bldg. 172 via the following schedule:

Morning (AM)	Time	Evening (PM)	Time
Route 17 Commuter Lot	5:15 AM	M St. & Department of Transportation	3:30 PM
Route 630 Commuter Lot	5:30 AM	Navy Yard Building 197	3:40 PM
M & 2nd Street	6:27 AM	Route 630 Commuter Lot	4:30 PM
Navy Yard Bldg. 197	6:30 AM	Route 17 Commuter Lot	4:45 PM
Bldg. 172	6:33 AM		

- **Run #2 – Ft. Belvoir:** This routes serves the Route 17 Commuter Lot, Route 630 Commuter Lot, Hospital, Gunston and Jackson Loop, and Buildings 707, 269, 214, 219, 320, and 307 via the following schedule:

Morning (AM)	Time	Evening (PM)	Time
Route 17 Commuter Lot	4:50 AM	Building 307	3:30 PM
Route 630 Commuter Lot	5:00 AM	Building 320	
Hospital		Building 214 and 219	
Gunston and Jackson Loop		Building 269	
Building 707		Building 707	
Building 269		Hospital	
Building 214 and 219		Corner of Gunston and Jackson Loop	
Building 320		Route 630 Commuter Lot	
Building 307		Route 17 Commuter Lot	

- **Run #3 – Crystal City and Pentagon (Assigned Seating):** This route serves the Route 208 Commuter Lot, Route 17 Commuter Lot, Pentagon Bus Bay, 12th & Eads, Crystal Gateway, Hilton Hotel, Airport Plaza 1, Crystal Park 5, Chrystal Park, and Crystal Mall 3 via the following schedule:

Morning (AM)	Time	Evening (PM)	Time
Route 208 Commuter Lot	5:00 AM	Hilton Hotel	3:31 PM
Route 17 Commuter Lot	5:15 AM	Airport Plaza 1	3:32 PM
Pentagon Bus Bay 11	6:15 AM	Crystal Park 5	3:33 PM
12th & Eads	6:17 AM	Crystal Park (Starbucks)	3:34 PM
Crystal Gateway (Stoplight near 12th & Clark Street)	6:18 AM	Crystal Mall 3 (1801 & 1805 Crystal Drive)	3:35 PM
Hilton Hotel	6:19 AM	Jefferson Plaza 1 (JP1)	3:36 PM
Airport Plaza 1	6:20 AM	Clark St. & Crystal Dr. (Gateway N. at Crosswalk)	3:37 PM
Crystal Park 5	6:21 AM	12th & Eads	3:38 PM
Crystal Park (Starbucks)	6:22 AM	Pentagon Bus Bay 11	3:43 PM
Crystal Mall 3 (1801 & 1805 Crystal Drive)	6:23 AM	Route 17 Commuter Lot	4:40 PM
Jefferson Plaza 1 (JP1)	6:24 AM	Route 208 Commuter Lot	4:55 PM

- **Run #5 – Crystal City & Pentagon (Assigned Seating):** This route serves the Route 208 Commuter Lot, Route 17 Commuter Lot, Route 630 Commuter Lot, 12 & Eads, Jefferson Plaza 2, Hilton Hotel, Crystal Mall 3, Crystal Park and Pentagon Bus Bay via the following schedule:

Morning (AM)	Time	Evening (PM)	Time
Route 208 Commuter Lot	5:30 AM	Hilton Hotel	4:25 PM
Route 17 Commuter Lot	5:48 AM	Crystal Park (Starbucks)	4:26 PM
Route 630 Commuter Lot	6:00 AM	Across from Crystal Mall 3	4:27 PM
12th & Eads	6:50 AM	Clark St. & Crystal Dr. (Gateway N. at Crosswalk)	4:30PM
Jefferson Plaza 2 (JP 2)	6:52 AM	12th and Eads (Stoplight)	4:31 PM
Hilton Hotel	6:55 AM	Pentagon Bus Bay 11	4:36 PM
Across from Crystal Mall 3	6:57 AM	Route 630 Commuter Lot	5:30 PM
Crystal Park (Starbucks)	7:00 AM	Route 17 Commuter Lot	5:40 PM
Pentagon Bus Bay 11	7:03 AM	Route 208 Commuter Lot	6:00 PM

- **Run #10 – Crystal City & Pentagon (Assigned Seating):** This route serves Route 3 Gordon Road, Route 610 Commuter Lot, Pentagon Bus Bay, 12 & Eads, Crystal Gateway 1, 2521 South Clark Street, 26th Street & Crystal Drive, Crystal Park, Water Park, Jefferson Plaza 1 and Clark Street & Crystal Drive via the following schedule:

Morning (AM)	Time	Evening (PM)	Time
Route 3 Gordon Road	5:30 AM	2521 S. Clark Street (at Crosswalk)	4:45 PM
Route 610 Commuter Lot	6:00 AM	26th Street & Crystal Drive	4:46 PM
Pentagon Bus Bay 11	6:45 AM	Crystal Park (Starbucks)	4:47 PM
12th & Eads	6:47 AM	Water Park (across from Post Office)	4:48 PM
Crystal Gateway 1	6:48 AM	Jefferson Plaza 1 (JP1)	4:50 PM
2521 South Clark Street (at Crosswalk)	6:50 AM	Clark St. & Crystal Dr. (Gateway North at Crosswalk)	4:53 PM
26th Street & Crystal Drive	6:51 AM	******	
Crystal Park (Starbucks)	6:52 AM	12th & Eads	4:55 PM
Water Park (across from Post Office)	6:53 AM	Pentagon (Bus Bay 11)	5:00 PM
Jefferson Plaza 1 (JP1)	6:54 AM	Route 610 Commuter Lot	5:45 PM
Clark Street & Crystal Drive (Gateway North at Crosswalk)	6:55 AM	Route 3 Gordon Road	6:10 PM

- **Run #14 – Crystal City & Pentagon (Assigned Seating):** This route provides service to Route 3 Gordon Road, Route 610 Commuter Lot, Pentagon Bus Bay, 12th & Eads, Crystal Gateway 1, Hilton, 26th Street & Crystal Drive, Crystal Park, Water Park, Jefferson Plaza 1 and Clark Street & Crystal Drive via the following schedule:

Morning (AM)	Time	Evening (PM)	Time
Route 3 Gordon Road	4:30 AM	Hilton	3:30 PM
Route 610 Commuter Lot	4:55 AM	26th Street & Crystal Drive	3:31 PM
Pentagon Bus Bay 11	5:50 AM	Crystal Park 4 (Starbucks)	3:33 PM
12th & Eads	5:52 AM	Water Park (across from Post Office)	3:35 PM
Crystal Gateway 1	5:53 AM	Jefferson Plaza 1 (JP1)	3:38 PM
Hilton	5:55 AM	Clark Street & Crystal Drive (Gateway North at Crosswalk)	3:41 PM
26th Street & Crystal Drive	5:56 AM	12th & Eads	3:42 PM
Crystal Park (Starbucks)	5:57 AM	Pentagon Bus Bay 11	3:47 PM
Water Park (across from Post Office)	5:58 AM	Route 610 Commuter Lot	4:30 PM
Jefferson Plaza 1 (JP1)	5:59 AM	Route 3 Gordon Road	5:00 PM
Clark Street & Crystal Drive (Gateway North at Crosswalk)	6:00 AM		

- **Run #7 – Rosslyn/Navy Annex (Assigned Seating):** This route serves the Route 17 Commuter Lot, Route 630 Commuter Lot, Rosslyn, Navy Annex, and Arlington Cemetery via this schedule:

Morning (AM)	Time	Evening (PM)	Time
Route 17 Commuter Lot	5:25 AM	Navy Annex (Steps)	4:05 PM
Route 630 Commuter Lot	5:35 AM	Arlington Cemetery (Columbia Pike)	4:08 PM
Rosslyn (1000 Wilson Blvd)	6:45 AM	Rosslyn (1000 Wilson Blvd)	4:15 PM
Navy Annex (Steps)	7:00 AM	Route 630 Commuter Lot	5:05 PM
Arlington Cemetery (Columbia Pike)	7:03 AM	Route 17 Commuter Lot	5:15 PM

- **Run #9 – Bailey's Crossroad (Assigned Seating):** This route provides service to Route 3 Commuter Lot at Gordon Road, Route 630 Commuter Lot, Mark Center, Skyline 6, Skyline 7 and Park Center via the following schedule:

Morning (AM)	Time	Evening (PM)	Time
Route 3 Commuter Lot (Gordon Road)	4:40 AM	Skyline 6	3:40 PM
Route 630 Commuter Lot	5:00 AM	Skyline 7	3:45 PM
Mark Center (Buildings 4850 & 4900)	5:40 AM	Park Center	3:50 PM
Skyline 6	5:45 AM	Mark Center (Buildings 4850 & 4900)	3:55 PM
Skyline 7	5:50 AM	Route 630 Commuter Lot	4:45 PM
Park Center	6:00 AM	Route 3 Commuter Lot (Gordon Road)	5:10 PM

- **Run #12 – Washington DC (Assigned Seating):** This route provides service to the Route 3 Ukrops, Route 630 Commuter Lot, and stops in Washington, D.C. as identified in the following schedule:

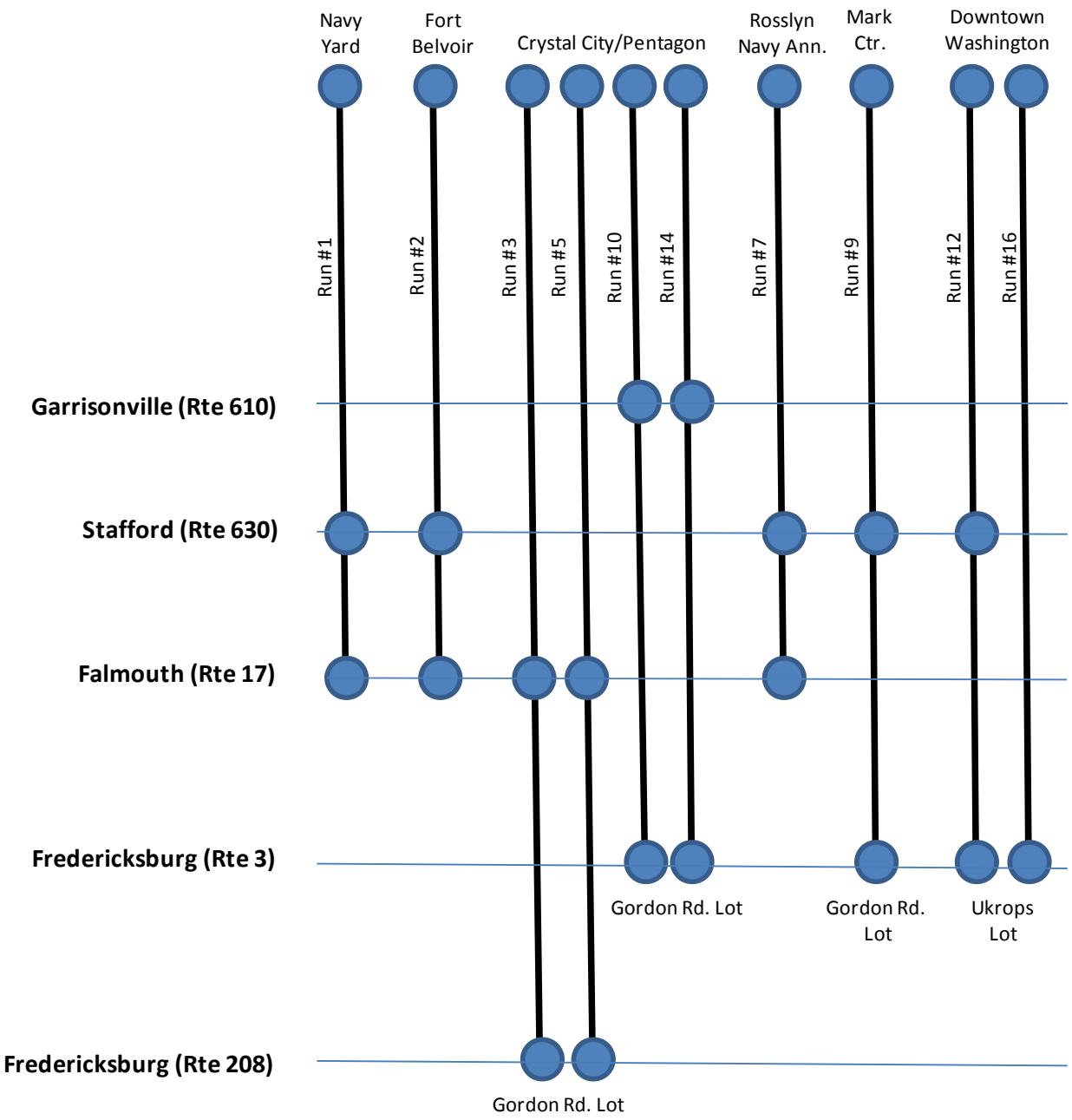
Morning (AM)	Time	Evening (PM)	Time
Route 3 Ukrops	5:00 AM	12th & Constitution	4:30 PM
Route 630 Commuter Lot	5:15 AM	12th & G NW	4:33 PM
14th Between C & Independence (Across from Holocaust M)	6:10 AM	9th & H NW	4:35 PM
12th & Constitution	6:15 AM	7th & H NW (Chinatown Metro)	4:36 PM
6th & Independence	6:17 AM	E Street a 4th	4:42 PM
4th & Independence	6:19 AM	4th & Independence (American Indian Museum)	4:46 PM
3rd & E	6:22 AM	7th & Independence (Hirshhorn Museum)	4:47 PM
6th & F NW	6:26 AM	12th & Independence (Metro stop– Across Agriculture S. Bldg.)	4:49 PM
7th & H NW (Chinatown Metro)	6:27 AM	Route 630 Commuter Lot	5:45 PM
9th & H	6:28 AM	Route 3 Ukrops	6:00 PM

- **Run # 16 – Washington, D.C. (Assigned Seating):** This route provides service to the Route 3 Ukrops and stops in Washington, D.C. as identified in the following schedule:

Morning (AM)	Time	Evening (PM)	Time
Route 3 Ukrops	5:00 AM	E & North Capital	3:32 PM
14th Between C & Independence	5:59 AM	1st & D	3:35 PM
12th & Independence	6:00 AM	4th & Independence	3:41 PM
6th & Independence	6:04 AM	7th & Independence	3:43 PM
4th & Independence	6:08 AM	12th & Independence	3:45 PM
1st & D	6:10 AM	Route 3 Ukrops	5:00 PM
E & North Capital	6:13 AM		

Overall, the Quick's Bus Company averages 400 customers per day, making two trips a day (i.e., 800 total one-way trips). **Figure 5-6** illustrates bus route patterns operated by Quick's.

Figure 5-6
Quick's Bus Route Patterns



5.6 The Martz Group

The Martz Group (Martz) provides 14 commuter routes from the Fredericksburg region with a fleet of 55-passenger deluxe motor coaches. Nearly all Martz bus trips serve the central core of Washington, D.C. Commuter lots in Spotsylvania and Stafford counties served by Martz are the same as noted earlier for Quick's with one exception. Martz bus service does not serve the Route 630 (Stafford) commuter lot. Lots served by Martz are as follows:

Table 5.4: Commuter Lots Served by Martz

Commuter Lot	Location
Rte 208	Lot is located on Houser Drive, off 208 east of I-95
Rte 3 (Old Commuter Lot)	Lot is off Route 3 in Fredericksburg, behind the old Ukrops store
Rte 3 Gordon Rd	Lot is at the corner of Gordon Road and Rt. 3 West, coming from Fredericksburg
Rte 17	Lot is located on Rt. 17 in Falmouth across from Pizza Hut on the left hand side
North & South Lots at Rte 610	North Lot is located north of Garrisonville Rd. behind the McDonalds on Staffordborough Blvd. South lot is located south of Garrisonville Road, off of Mine Road. Most buses go to the North lot. Some buses are scheduled to serve both the North and South lots

Fares for Martz's Fredericksburg to Washington, D.C. commuter service are as follows:

- **10-punch:** 10 one-way tickets that expire after 90-days for $140.00
- **20-punch**: 20 one-way tickets that expire after 90-days for $215.00
- **32-punch:** 32 one-way tickets that expire after 90-days for $240.00
- **1-month:** Good for one-month period. Expires after month on ticket expires for $290.00; and
- **1-day** or **1-way** for $24.00

The 1-month ticket is a flat rate ticket at a reduced rate to give the daily riders a discount. Accepted payment methods include Cash, Check, TranBen Checks, SmarTrip Card, and Smart Benefit Vouchers. Passengers can pay via phone with a credit card. All routes are open seating.

Martz averages about 450 riders each way on its 14 peak period trips (900 one-way trips each day). The following tables provide the northbound AM commuter route schedules from Fredericksburg provided by Martz. Northbound bus route patterns are illustrated in **Figure 5-7**.

Southbound DC commuter routes returning to Fredericksburg operate on the following schedules. Southbound bus route patterns are illustrated in **Figure 5-8**.

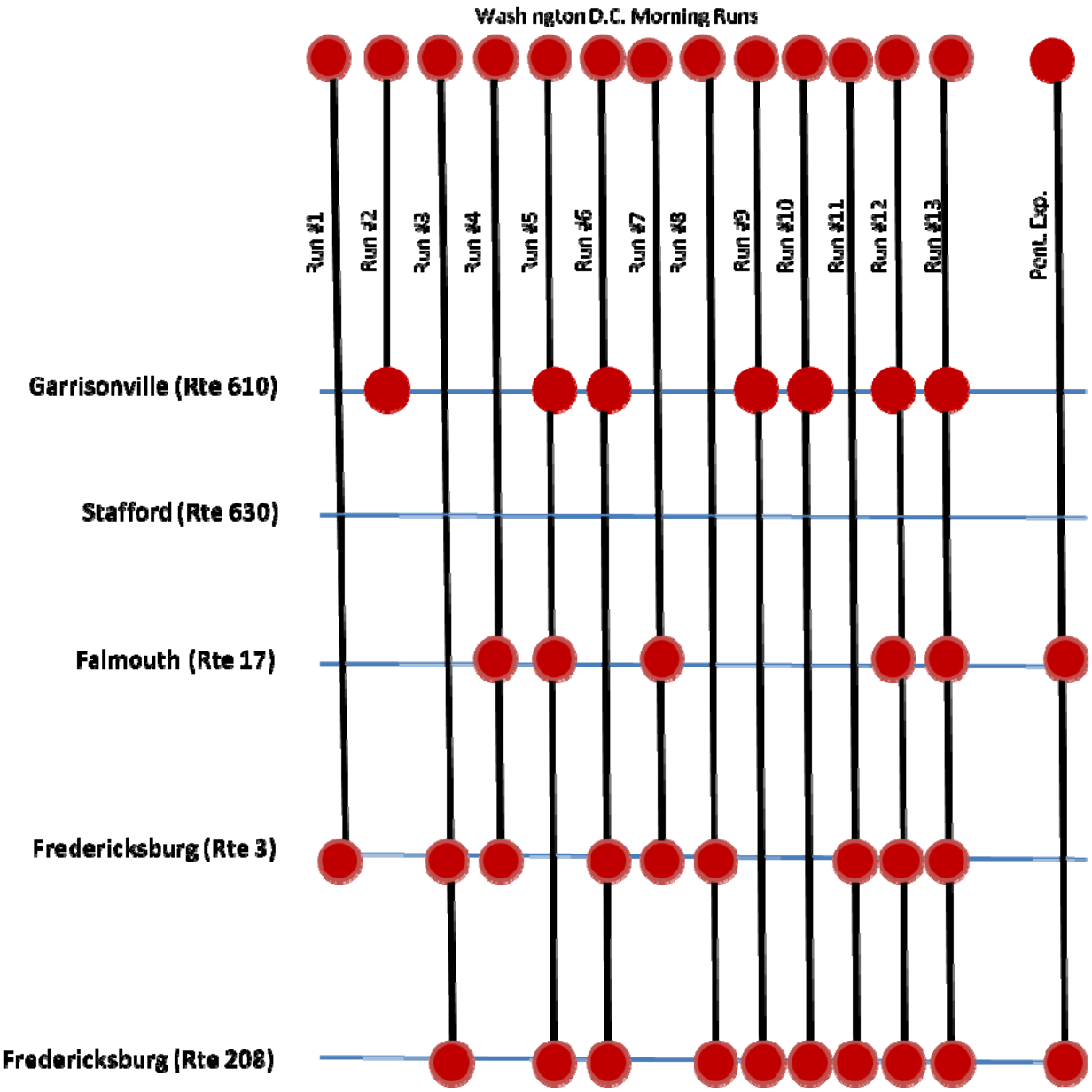
Northbound AM DC Commuter Routes - Effective April 18, 2011

DC 1 AM	
Rt 3	5:05
14th & C St	6:00
7th & Independence (DOT)	6:03
10th & Constitution	6:05
12th & Constitution	6:07
14th & Reagan Blvd	6:10
14th & NY	6:12
8th & H	6:15
5th & H	6:20

Stop	Pent Exp	DC 2	DC 3	DC 4	DC 5	DC 6	DC 7	DC 8	DC 9	DC 10	DC 11	DC 12	DC 13
Rt 208	4:25		4:35		5:35	5:45		6:15	6:25	4:30	5:30	6:25	4:50
Rt 3			4:50	5:40		6:00	6:15	6:30			5:45	6:40	5:05
Rt 17	4:55			5:55	5:55		6:30					6:55	5:20
Rt 610		5:15			6:10	6:25			6:50	5:00		7:10	5:35
Army/Navy & Fern			6:05	6:55	6:55	7:20	7:30	7:40	7:48	5:51	6:55	8:08	
Army/Navy &Macys			6:06										
S Fern & S Rotary					6:56						6:56		
Pentagon L3	5:50									5:55			6:20
2531 Clark St										5:59			
Va & E	6:00	6:12	6:12	7:02		7:27	7:40	7:50	8:05			8:25	
20th & E	6:03	6:15	6:15	7:04		7:29	7:42	7:52	8:07			8:27	
19th & F					7:22						7:22		
20th & G	6:04	6:16	6:16	7:07		7:30	7:43	7:53	8:10			8:28	
20th & I	6:05	6:17	6:17	7:09		7:32	7:45	7:55	8:12			8:33	
19th & K					7:19						7:19		
18th & K					7:18						7:18		
17th & K	6:08	6:20	6:20	7:17	7:17	7:36	7:49	7:59	8:15		7:17	8:36	
15th & K	6:10	6:22	6:22	7:19	7:14	7:38	7:51	8:01	8:17		7:14	8:38	
14th & K				7:20									
13th & K								8:03	8:21				
13th & NY	6:12	6:24	6:24	7:21		7:42	7:54	8:04	8:22			8:41	
12th & G					7:10						7:10		
13th & Penn	6:13	6:25	6:25	7:22		7:44	7:56	8:06	8:25			8:43	
12th & Penn					7:09						7:09		
10th & Penn	6:15	6:27	6:27	7:24		7:46	7:57	8:07	8:27			8:44	
7th & Penn	6:16	6:30	6:30	7:27		7:48	7:59	8:09	8:30			8:46	
7th & Ind	6:17	6:32	6:32	7:30		7:50	8:01	8:11				8:48	
L'Enf Prom	6:19	6:35	6:35	7:32		7:51	8:02	8:12	8:35			8:49	
12th & Const					7:08						7:07		
12th & Ind					7:05	7:53	8:04				7:05	8:51	6:35
14th & Ind	6:21	6:37	6:37	7:34		7:54	8:06	8:16	8:37			8:52	
27th St & Crystal Dr										6:01			
20th St & Crystal Dr										6:03			
Water Park Towers										6:06			
Union Station													6:45

**** DC9 AM picks up at both 610 commuter lots.*

Figure 5-7
Martz Group Northbound Commuter Route Patterns



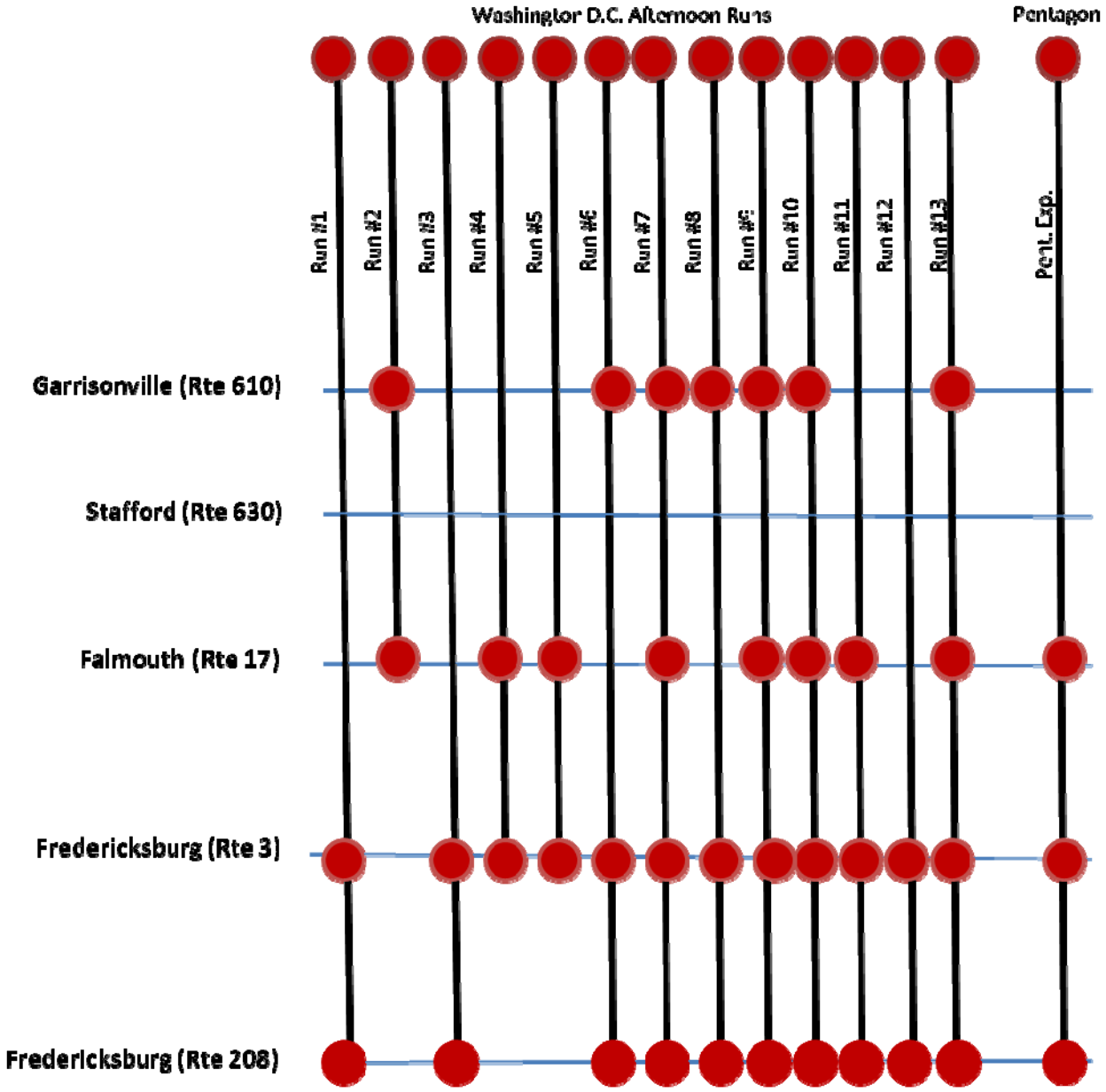
Southbound PM DC Commuter Routes - Effective April 18, 2011

Stop	DC 1 PM	DC 12 PM
7th & Ind	3:50	3:40
6th & G	3:54	3:44
8th & H (former Chopsticks)	3:55	3:45
14th & G	4:02	3:52
14th & Penn (Commerce)	4:06	3:56
14th & Ind	4:09	3:59
Rt 3	5:25	5:12
Rt 208	5:35	5:24

Rt	Pent Exp	DC 2	DC 3	DC 4	DC 5	DC 6	DC 7	DC 8	DC 9	DC 10	DC 11	DC 13	Noon
Va & E (State Dept)		3:50	3:50	4:20	4:31	4:35	5:05	5:05	5:40	6:25	3:07		12:30
20th & E		3:52	3:52	4:22	4:33	4:37	5:07	5:07	5:43	6:27	3:09		
20th & G		3:53	3:53	4:23	4:35	4:38	5:08	5:08	5:44	6:28	3:10		
20th & I		3:54	3:54	4:25	4:37	4:40	5:10	5:10	5:46	6:30	3:11		12:33
17th & K		3:57	3:57	4:29	4:40	4:44	5:15	5:15	5:50	6:35	3:14		
15th & K		4:00	4:00	4:31	4:42	4:46	5:18	5:18	5:52	6:38	3:17		12:37
14th & NY				4:34					5:56				12:40
13th & NY		4:03	4:03		4:47	4:51	5:22	5:22		6:42	3:20		
14th & G				4:36					5:58				
14th & DOC				4:38					6:00				
14th & Const													12:43
13th & Penn		4:07	4:07			4:52	5:26	5:26		6:46	3:24		
12th & Penn (OPO)					4:50								
10th & Penn		4:08	4:08			4:53	5:28	5:28		6:48	3:25		
7th & Penn		4:10	4:10		4:54	4:55	5:30	5:30		6:50	3:27		
7th & Ind		4:12	4:12		4:59	4:59	5:34	5:34		6:52	3:29		
L'Enf Prom		4:14	4:14		5:00	5:01	5:36	5:36		6:54	3:31		
14th & Ind				4:41					6:03				12:48
14th & C		4:16	4:16		5:02	5:02	5:37	5:37		6:55	3:33		
27th & Crystal Dr	4:00												
20th & Crystal Dr	4:02												
Water Park Towers	4:05												
Army/ Navy & Fern	4:10		4:23	4:50		5:05	5:45		6:08	7:00	3:45		12:55
Union Station												4:45	
12th & Ind												5:05	
Pentagon Bay L3	4:15											5:15	
Rt 610		5:10				6:00	6:30		7:12	7:45	4:30	5:55	1:40
Rt 17	5:15	5:30		5:55	6:00		6:50		7:28	8:00	4:50	6:10	1:55
Rt 3	5:30		5:35	6:10	6:15	6:30	7:05	7:00	7:43	8:15	5:05	6:30	2:20
Rt 208	5:45		5:50			6:40	7:20	7:15	7:53	8:30	5:20	6:45	2:35

**** DC 7 PM, DC 9 PM and DC 10 PM drop at both 610 lots; Noon shuttle drops at both 610 lots*

Figure 5-8
Martz Group Southbound Commuter Route Patterns



5.7 Virginia Railway Express

The I-95 corridor is also served by VRE's Fredericksburg commuter rail line. VRE is operated through a partnership between the Northern Virginia Transportation Commission (NVTC) and PRTC. NVTC represents the counties of Arlington, Fairfax and Loudoun and the cities of Alexandria, Fairfax and Falls Church, while PRTC represents the counties of Prince William, Stafford and Spotsylvania and the cities of Manassas, Manassas Park, and Fredericksburg. The line serving I-95 operates from Fredericksburg to Union Station in Washington, D.C. and includes service to the following rail stations:

- Union Station
- L'Enfant
- Crystal City
- Alexandria
- Franconia-Springfield
- Lorton
- Woodbridge
- Rippon
- Quantico
- Brooke
- Leeland Road
- Fredericksburg

VRE stations that are located in Fairfax County are: Franconia-Springfield and Lorton. Stations that are within Prince William County are: Woodbridge, Rippon and Quantico. Brooke and Leeland Road stations are located in Stafford County.

Parking spaces and park-and-ride utilization rates tend to be more fully utilized towards the south end of the Fredericksburg rail line, as shown below in **Table 5-5**:

Table 5-5: VRE Station Parking Lots:

VRE Station	Parking Spaces	Spaces Utilized*
Franconia-Springfield	Parking owned by WMATA	
Lorton	567	67%
Woodbridge	738**	70%
Rippon	676	74%
Quantico	258	79%
Brooke	499	89%
Leeland Road***	827	96%
Fredericksburg***	644	91%

Notes:
** Spaces Utilized based on May 2011 parking lot survey, reported on VRE web site.*
*** Woodbridge parking spaces include a parking garage*
**** These stations have overflow parking that is included in % utilization calculations*

A zonal fare structure is used by VRE. Stations in each Zone along the Fredericksburg rail line are as follows:

- Zone 1 – Union Station, L'Enfant
- Zone 2 – Crystal City, Alexandria
- Zone 3 – Franconia-Springfield
- Zone 4 – Lorton
- Zone 5 – Woodbridge, Rippon
- Zone 6 – Quantico
- Zone 7 – n/a
- Zone 8 – Brooke, Leeland Road
- Zone 9 – Fredericksburg

The maximum single ride fare from Fredericksburg to Union Station (Zone 9 to Zone 1) is $10.30. Discounts are provided for ten-ride, five day and monthly passes.

VRE operates on weekdays only. There are seven inbound trips and seven outbound trips. Train numbers, starting times and ridership by train are shown in **Table 5-6**. Midweek ridership currently averages over 10,600 riders each day.

Table 5-6: VRE Ridership by Train Trip

Time Period	Train Number	Departure Time	Rail Cars and Seats/Train	Midweek Ridership	Train Occupancy
AM	300	5:05	5 (645 seats)	527	82%
	302	5:15	6 (798 seats)	769	96%
	304	5:40	6 (819 seats)	910	111%
	306	6:05	8 (1,095 seats)	939	86%
	308	6:30	6 (819 seats)	941	115%
	310	7:15	6 (908 seats)	635	70%
	312	7:40	4 (522 seats)	490	94%
PM	301	12:55	4 (522 seats)	149	29%
	303	3:35	6 (798 seats)	1,049	131%
	305	4:10	6 (819 seats)	1,017	124%
	307	4:40	8 (1,095 seats)	1,186	108%
	309	5:15	6 (819 seats)	1,107	135%
	311	6:00	6 (908 seats)	611	67%
	313	6:40	5 (645 seats)	274	42%

Train schedule, train make-up (consist) and ridership based on May 2011 information in VRE's web site.

In addition to the trips identified above, VRE has an Amtrak Cross Honor Agreement. VRE passengers possessing a multi-ride ticket (i.e., monthly, five day, or 10 trip) can ride on select Amtrak trains at a cost of $5 per trip. These Amtrak trains are as follows:

Inbound Amtrak Trains

- Amtrak Train #86 – departs Fredericksburg at 7:00 a.m.
- Amtrak Train #174 – departs Fredericksburg at 8:00 a.m.
- Amtrak Train #84 – departs Fredericksburg at 8:58 a.m.
- Amtrak Train #94 – departs Fredericksburg at 12:04 p.m.

Outbound Amtrak Trains

- Amtrak Train #95 – departs Union Station at 2:30 p.m.
- Amtrak Train #125 – departs Union Station at 3:55 p.m.
- Amtrak Train #93/83 – departs Union Station at 5:50 p.m.
- Amtrak Train #85/87 – departs Union Station at 7:00 p.m.

Amtrak trains do not stop at all VRE stations. They generally stop at 2 to 4 stations in between Fredericksburg and Union Station.

Ridership has been steadily growing on the Fredericksburg line. Growth has been more pronounced in the past few months as gasoline prices have risen. **Table 5-7** presents monthly ridership for FY 2010 and the first 11 months of FY 2011.

Table 5-7: VRE Monthly Ridership Trends

Month	FY 2010		FY 2011		Percent Change
	Monthly	Cumulative	Monthly	Cumulative	
July	179,830	179,830	183,554	183,554	2.1%
August	171,750	351,580	186,007	369,561	5.1%
September	177,310	528,890	191,390	560,951	6.1%
October	178,340	707,230	188,099	749,050	5.9%
November	154,091	861,321	187,743	936,793	8.8%
December	156,037	1,017,358	182,553	1,119,345	10.0%
January	167,813	1,185,171	192,585	1,311,930	10.7%
February	122,003	1,307,174	191,941	1,503,871	15.0%
March	204,066	15,11,240	240,799	1,744,670	15.4%
April	191,567	1,702,807	214,564	1,959,234	15.1%
May	174,015	1,876,822	213,372	2,172,606	15.8%
June	192,978	2,069,800	n/a	n/a	n/a

Note: ridership includes Amtrak Cross Honor train riders

VRE conducts a passenger survey every fall to determine passenger trip boarding and alighting locations. Survey data from Fall 2010 was used to determine passenger travel characteristics. A total of 3,256 surveys were completed on the Fredericksburg line on morning train trips (only morning trips were surveyed). As there is a 60-65 percent response rate to the survey, it should be noted that survey results do not reflect total VRE ridership. Rail station boarding and alighting locations are summarized in **Table 5-8**. Pertinent findings are as follows:

- Fredericksburg Station had 35% of all boardings – the highest of all stations
- Fredericksburg, Leeland Road and Brook, combined account for 67% of all boardings
- Quantico, Rippon, Woodbridge and Lorton account for 30% of all boardings
- 87% of all train trips were destined to L'Enfant Station
- Alexandria, Crystal City, L'Enfant and Union Station account for 87% of all trip destinations

Table 5-8: VRE 2010 Rider Survey Origins and Destinations

Fredericksburg Line	Destinations											
Origins	Leeland Road	Brooke	Quantico	Rippon	Woodbridge	Lorton	Franconia/ Springfield	Alexandria	Crystal City	L'Enfant	Union Station	Total
Fredericksburg	0	0	68	1	17	61	64	145	256	359	169	**1,140**
Leeland Road	-	0	36	1	7	63	24	74	152	240	67	**664**
Brooke	-	-	9	1	4	17	22	38	130	137	43	**401**
Quantico	-	-	-	0	0	8	11	23	81	78	40	**241**
Rippon	-	-	-	-	0	1	9	57	95	131	81	**374**
Woodbridge	-	-	-	-	-	1	4	31	55	98	71	**260**
Lorton	-	-	-	-	-	-	1	11	30	53	40	**135**
Franconia/Springfield	-	-	-	-	-	-	-	2	1	9	16	**28**
Alexandria	-	-	-	-	-	-	-	-	0	1	8	**9**
Crystal City	-	-	-	-	-	-	-	-	-	0	4	**4**
Total	**0**	**0**	**113**	**3**	**28**	**151**	**135**	**381**	**800**	**1,106**	**539**	**3,256**

5.8 Corridor Bus Volumes and Ridership

As noted in the prior sections, there are significant bus volumes that originate along the redefined I-95 HOT/HOV Lanes project and are destined for the Pentagon and central Washington, D.C. Using existing schedules, daily bus volume impacts have been determined for the public transit operators in the I-95 corridor, and are noted below in **Table 5-9**. Daily bus volumes have been broken out by operator, by direction of travel, and by time period. As noted in this table, PRTC operates the largest number of bus trips originating along the I-95 corridor. **Figure 5-9** illustrates a.m. peak period bus volumes.

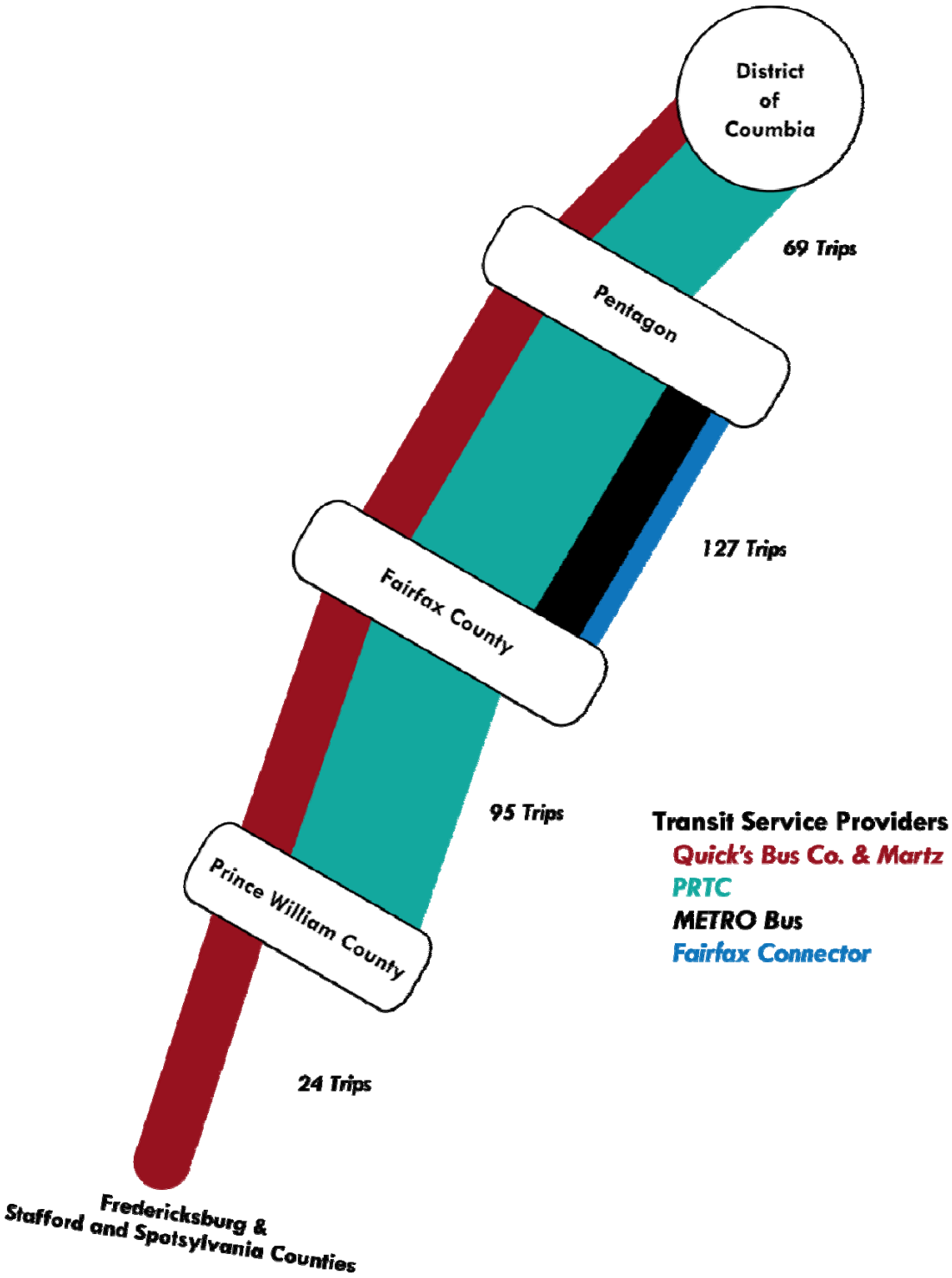
Table 5-9: Daily Bus Volumes Originating in the I-95 Corridor by Time Period

Bus Volume Locations	AM Peak (5-9 a.m.) NB	AM Peak (5-9 a.m.) SB	Midday (9 am-3 pm) NB	Midday (9 am-3 pm) SB	PM Peak (3-7 pm) NB	PM Peak (3-7 pm) SB	Evening (after 7 pm) NB	Evening (after 7 pm) SB
I-395, S. of Pentagon								
Fairfax Connector (380D)	11	0	0	0	0	11	0	0
MetroBus (18's)	22	7	0	0	7	28	0	1
PRTC	71	0	1	10	0	79	0	6
Quicks/Martz	23	0	0	0	0	23	0	0
Total	**127**	**7**	**1**	**10**	**7**	**141**	**0**	**7**
I4th St. Bridge, N. of Pentagon								
PRTC	53	0	1	7	0	59	0	4
Quicks/Martz	16	0	0	0	0	16	0	0
Total	**69**	**0**	**1**	**7**	**0**	**75**	**0**	**4**
Trips into/out of Pentagon								
Fairfax Connector (380D)	11	0	0	0	0	11	0	0
MetroBus (18's)	22	7	0	0	7	28	0	1
PRTC	41	0	0	8	0	45	0	5
Quicks/Martz	5	0	0	0	0	5	0	0
Total	**79**	**7**	**0**	**8**	**7**	**89**	**0**	**6**

Existing combined daily ridership (one way passenger trips per day) on I-95 corridor express routes and VRE is estimated to be as follows:

Fairfax Connector and Metrobus – 1,200 riders/day
PRTC OmniRide – 5,800 riders/day
Quick's and Martz – 1,700 riders/day
VRE – 10,000 riders/day
Total – Approximately 19,000 riders/day

Figure 5-9
AM Peak Period Bus Volumes Originating Along I-95 and Continuing on I-395
(5 to 9 a.m.)
(Northbound Direction)



Looking again at **Table 5-9**, most of these trips continue on I-395 to just south of the Pentagon. Over half of the daily bus trips continue across the 14th Street Bridge into central Washington, D.C. It is important to note the impact bus trips originating along I-95 can have north of the I-95 HOT/HOV Lanes project on the destination end on I-395 and also arterial streets (primarily within the central area of Washington, D.C.) As noted in **Table 5-9**, there are 69 bus trips originating crossing the 14th Street Bridge into central Washington, D.C. in the a.m. peak period, and 75 bus trips departing central Washington D.C. in the p.m. peak period. Many of the PRTC bus trips in the a.m. peak period follow one of the following two route patterns: 14th Street, Eye Street and 19th Street to the State Department, or 14th Street, H Street, 11th Street and Pennsylvania Avenue to Constitution Avenue, with service continuing to L'Enfant Plaza. These patterns are generally reversed in the afternoon. Martz buses generally tend to follow 20th Street, K Street, 14th Street, Pennsylvania Avenue and Independence Avenue.

5.9 Destination End Bus Service

Table 5-9 and **Figure 5-9** focus on bus service originating along I-95. North of the I-95 HOT/HOV Lanes project, a significant number of bus routes provide service on I-395 south of the Pentagon (operated by PRTC, Fairfax Connector, WMATA, Alexandria Transit Company, Arlington Transit, Martz and Quick's) and across the 14th Street Bridge into central Washington, D.C. (operated by PRTC, WMATA, Loudoun County Transit, Martz and Quick's).

To provide a fuller picture of bus service on the destination end, **Table 5-10** lists all routes crossing the Potomac River into central Washington, D.C. via the 14th Street Bridge. In the same fashion, **Table 5-11** lists all of the routes currently operating on I-395 at a point just south of the Pentagon.

Table 5-10: All Routes Using the 14th Street Bridge

Provider	Route	Route Name
WMATA	5A	Dulles-DC
	11Y	Mt. Vernon Express
	13F, G	Ronald Reagan Airport-Federal Triangle
	16F	Columbia Pike-Federal Triangle
Loudoun County Transit (LCT)	Christian Fellowship	Pentagon-Crystal City-Washington
	Dulles North	Rosslyn-Pentagon-Crystal City-Washington
	Dulles South	Rosslyn-Pentagon-Crystal City-Washington
	Leesburg	Rosslyn-Pentagon-Crystal City-Washington
	Purcellville	Rosslyn-Pentagon-Crystal City-Washington
PRTC	DC-R	Dale City-Washington
	DC-R	Dale City-Navy Yard
	LR-R	Lake Ridge-Washington
	MC-R	Montclair
	MN-R	Manassas
	R1-R	Route 1/South Route 1
Martz	Various Runs	Pentagon-Crystal City-Washington
Quick's	Various Runs	Pentagon-Crystal City-Washington

Table 5-11: All Routes Operating on I-395 South of the Pentagon

Provider	Route	Route Name
WMATA	7A, E, F, Y	Lincolnia-North Fairlington
	7B, C, D, H, P, W, X	Lincolnia-Park Center-Pentagon
	16L	Annandale-Skyline City-Pentagon
	17A, B, F, M	Kings Park
	17G, H, K, L	Kings Park Express
	18E, F	Springfield
	18G, H, J	Orange Hunt
	18P	Burke Centre
	21A, D	Landmark-Pentagon
	22A	Barcroft-South Fairlington
	25A, C, D	Ballston-Bradlee-Pentagon
	28F, G	Skyline City
	29C, E, G, H, X	Annandale
Arlington Transit (ART)	ART 87X	Pentagon Metro-Shirlington
Alexandria Transit Company (DASH)	AT3	Hunting Towers-Parkfairfax, Pentagon
	AT4	Old Town-Parkfairfax, Pentagon
Fairfax Connector	306	GMU-Pentagon
	380D	Gambrill Road-Pentagon Express-DETOUR
PRTC	DC-R	Dale City-Washington
	DC-R	Dale City-Pentagon & Crystal City
	DC-R	Dale City-Navy Yard
	LR-R	Lake Ridge-Washington
	LR-R	Lake Ridge-Pentaton & Crystal City
	MC-R	Montclair
	R1-R	Route 1/South Route 1
	RB-R	Rosslyn/Ballston
Martz	Various Runs	Pentagon-Crystal City-Washington
Quick's	Various Runs	Pentagon-Crystal City-Washington

Destination end impacts to key Metrorail stations are also important to consider, as capacity is limited. In particular, planning is underway to add bus bays to both the Pentagon and Franconia-Springfield stations.

The Pentagon Station currently has 11 bus bays on the upper level and 10 bus bays on the lower level, as shown in **Figure 5-10.** The upper bus bays are served by WMATA and Arlington Transit (ART) routes, as listed in **Table 5-12**. The lower bus bays are served by WMATA, PRTC, Fairfax Connector, Alexandria Transit Company (DASH), Loudoun County Transit, Martz and Quick's as listed in **Table 5-13.**

As noted earlier in Table 5-9, p.m. peak period volumes for I-95 corridor routes at the Pentagon Station are higher than a.m. peak volumes. Corridor bus volumes at Pentagon Station, however, are just a fraction of total bus activity at the Station, as noted in Tables 5-12 and 5-13. Therefore, total bus volumes for trips into and out of the Pentagon Station were determined for the p.m. peak period (3-7 p.m.) and the p.m. peak hour (4:30 to 5:30 p.m.). **Table 5-14** presents these volumes. Note that these volumes do not include Department of Defense (DoD) shuttles that also use Pentagon Station bus bays.

Figure 5-10
Pentagon Metrorail Station Bus Bays

Map obtained from WMATA web site www.wmata.com

Table 5-12: All Routes Serving the Pentagon Station Upper Bus Bays

Provider	Route	Final Destination	Bus Bay	Frequency					
				M-F AM	M-F Mid/Eve	M-F PM	Saturday	Sunday	F-Sat Late
Arlington Transit (ART)	ART 42	Ballson-MU M	U4	20	30	20	60		
	ART 87	Shirlington	U4		30		30		
	ART 87A	26th St & Troy St	U4	20		11-21			
	ART 87X	Shirlington	U4	20		20			
WMATA	10A	Hunting Towers	U13	30	30	30	30	60	60
	10E	Braddock Road M	U13			10-20			
	13F	Archives Station (2) NB, (1) SB	U2				30#	40-50#	
	13G	Archives Station (1) NB, (2) SB	U2				30#	30-50#	
	16A	Annandale	U10	60	60	60			
	16B	Annandale	U10	30*		30*	30	30-60	
	16D	Annandale	U10	60	60	60			
	16E	Culmore	U10			20-60@	20-60@	20-60@	20-60@
	16F	Federal Triangle M	U2	12-28		13-30			
	16F	Culmore	U11			12-20			
	16J	Culmore	U11	30	30	30	30		
	16K	Columbia Heights West	U7				30#	30#	
	16L	Annandale	U7			30			
	16P	Culmore	U11					60	
	18E	Springfield [P]	U1			30			
	18F	Springfield [P]	U1	30					
	18G	Rolling Valley Mall [P]	U1			30			
	18H	Orange Hunt [P]	U1			30			
	18J	Rolling Valley Mall [P]	U1	30					
	18P	Burke Centre [P]	U1			12-35			
	22A	Ballson-MU M	U4	20	40	20	40		
	25A	Ballson-MU M	U3	24-31	60	21-43	65-70	60	
	25C	NVCC-Alexandria	U3			7-40			
	25D	NVCC-Alexandria	U3	25-30					
	28F	Skyline City [P]	U7	25-30					
	28G	Skyline City [P]	U7			20			
	7A	Landmark [P]	U5	60	60		60-67	45	
	7B	Southern Towers [P]	U5			36-38			
	7C	Park Center [P]	U5			15-28			
	7D	Southern Towers [P]	U5	35					
	7E	Southern Towers [P]	U5			18-60			
	7F	Landmark [P]	U5	60	60		60-67		
	7H	Landmark [P]	U5			30			
	7P	Park Center [P]	U5	15-20					
	7W	Landmark [P]	U6			5-33			
	7X	Lincolnia [P]	U6			13-19			
	7Y	Federal Triangle M (1) [P]	U2	8-20		15-35			
	7Y	Southern Towers	U5			10-20			
	9A	Huntington Station	U12	30	30	30	30	40-60	60
	9E	Braddock Road M	U12	15-20					

M ***Metro Station***
[P] ***Pentagon***
(1) Via Arlington Bridge
(2) Via 14th St. Bridge
 # Before 8:00 AM only
@ Late evenings only
**** Most service to Culmore only***

Table 5-13: All Routes Serving the Pentagon Station Lower Bus Bays

Provider	Route	Final Destination	Bus Bay	Frequency					
				M-F AM	M-F Midday	M-F PM	Saturday	Sunday	F-Sat Late
Alexandria Transit Company (DASH)	AT 3	Hunting Towers	L7	20		20			
	AT 4	Old Town	L7	20		20			
Fairfax Connector	306	George Mason University	L6	£	60	£			
	380	Franconia-Springfield Station	L3	15		15			
	595	Reston East	L3			15-20			
Loudoun County Transit (LCT)	Various Routes	Pentagon-Crystal City-Washington	L11	9 trips		7 trips			
Quick's	Various Runs	Pentagon-Crystal City-Washington	L11	4 trips		4 trips			
Martz	Various Runs	Pentagon-Crystal City-Washington	L3	3 trips		2 trips			
PRTC	Montclair	Pentagon-Washington	L1	8-36	2 trips	15-32			
	Dale City	Pentagon-Crystal City-Washington-Navy Yard	L1	5-44	2 trips	15-40			
	Route 1	Pentagon-Washington	L2	34-54	2 trips	41-60			
	Manassas	Pentagon-Washington	L2	10-38	2 trips	30-50			
	Lake Ridge	Pentagon-Crystal City-Washington-Capitol Hill	L2	12-26	2 trips	11-29			
WMATA	17A	George Mason University	L6	30	§	60-65^			
	17B	Kings Park West	L5		2 trips				
	17F	Kings Park West	L5	20-40					
	17G	George Mason University	L6			14-23			
	17H	Kings Park West	L5			15-32			
	17K	Kings Park West	L5			15-25			
	17L	Kings Park West	L6			19-30			
	17M	Kings Park West	L5			25			
	21A	Landmark	L9			17-20			
	21D	Landmark	L9			35#			
	29C	NVCC	L4	28-41					
	29E	NVCC/Braeburn Dr	L4			4 trips			
	29G	Annandale	L4		60^	12-20			
	29H	Annandale	L4			9-18			
	29X	NVCC/Braeburn Dr	L4			24-30			
	8S	Quaker Lane	L10	17-21					
	8W	Fox Chase	L10			26			
	8X	Quaker Lane	L10			26-39			
	8Z	Quaker Lane	L10			13			

a To early evenings

§ Midday service operated by Fairfax Connector Line 306

£ See Metro Route 17 for rush hour service along the Braddock Rd corridor

 # Three trips only

^ After 7:00 PM only

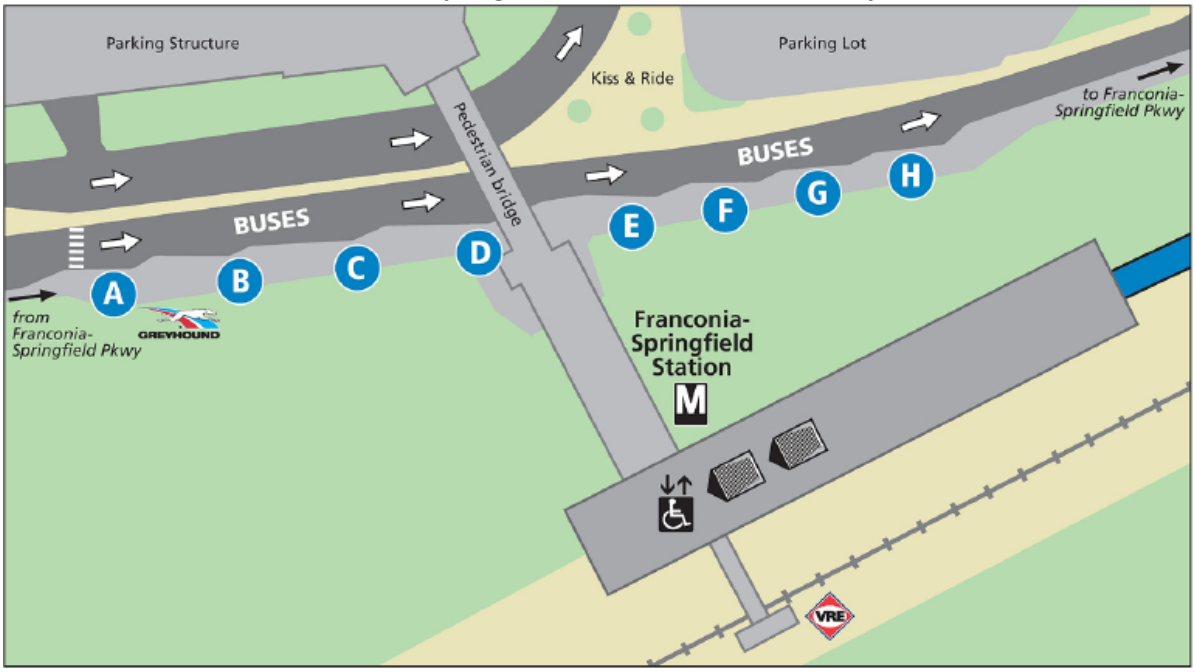
Table 5-14
P.M. Peak Period & Peak Hour Revenue Bus Trips
Departing Pentagon Station

Bus Routes Operated by:	P.M. Peak Period Bus Trips (3-7 p.m.)	P.M. Peak Hour Bus Trips (4:30-5:30 p.m.)
WMATA	262	92
DASH	22	6
ART	29	9
LC Transit	7	5
PRTC	50	17
Fairfax Connector	18	5
Martz/Quicks	5	3
TOTAL	**393 trips**	**137 trips**

Note: Above totals do not include DoD shuttle bus volumes.

The Franconia-Springfield Station currently has eight bus bays, as shown in **Figure 5-11.** Public transit routes that serve this station are operated by WMATA, Fairfax Connector, and PRTC routes, as listed in **Table 5-15**. Total bus volumes for trips into and out of the Franconia-Springfield Station were determined for the p.m. peak period (3-7 p.m.) and the p.m. peak hour (4:30 to 5:30 p.m.). **Table 5-16** presents these volumes.

Figure 5-11
Franconia-Springfield Metrorail Station Bus Bays



Map obtained from WMATA web site www.wmata.com

Table 5-15: All Routes Serving the Franconia-Springfield Station

Provider	Route	Final Destination	Bus Bay	Frequency					
				M-F AM	M-F Mid/Eve	M-F PM	Saturday	Sunday	F-Sat Late
Fairfax Connector	171	Huntington Station	F	30	60	30	60	60	
	231	Van Dorn Street Station	H	30	60@	30			
	232	Van Dorn Street Station	B	30	60@	30			
	301	Huntingdon Station	E	30	60@	30			
	303	Island Creek	H	30	60@	30			
	304	Saratoga	H	30		30			
	305	Newington Forest	H			30			
	310	Rolling Valley	F	30	60	30	60	60	
	310	Huntington Station	G	30	60	30	60	60	
	321	Van Dorn Street Station	E	30	60	30	60	60	
	322	Van Dorn Street Station	B	30	60	30	60	60	
	331	I-95 Circulator	F	30	60	30			
	332	I-95 Circulator	F	30	60	30			
	401	Tysons Westpark Transit Center	E	30	60	30	60	60	
PRTC	Prince William Metro Direct	PRTC Transit Center-Franconia-Springfield	C	30-40	60-65	30-40			
WMATA	18R	Burke Centre	D			24-38			
	18S	Burke Centre	D			16-37			
	18S	Springfield (and Mall Deck A)	D	10-28					
	S80	TAGS	D	15	15	15			
	S80	TAGS	D	15	15	15			
	S91	Mall Shuttle (Mall Deck A)	D	2-13	15	7-8			

@ No midday service after 7:30 pm

Table 5-16
P.M. Peak Period & Peak Hour Revenue Bus Trips
Departing Franconia-Springfield Station

Bus Routes Operated by:	P.M. Peak Period Bus Trips (3-7 p.m.)	P.M. Peak Hour Bus Trips (4:30-5:30 p.m.)
WMATA	43	13
PRTC	7	1
Fairfax Connector	96	29
TOTAL	**146 trips**	**43 trips**

5.10 Programmed and Planned Transit Improvements

Transit Development Plans (TDPs) were reviewed to determine programmed and planned improvements for the I-95 corridor service area.

5.10.1 Fairfax Connector

The Fairfax Connector TDP was completed in December 2009. Local service transit improvements proposed in this TDP are as follows:

- Fairfax Connector Routes
  - Restructure existing Route 171 into two routes – 171 and 371 (Since completion of this TDP, this recommendation has been modified. Route 171 will now terminate at Lorton VRE and Route 371 will terminate at the Franconia-Springfield Station.)
  - Restructure existing Routes 305 and 307 into a new Route 309 - will connect Lorton VRE, Sydenstricker park-and-ride and Franconia-Springfield Metrorail (Since completion of the TDP, this route will now be designated as Route 305.)
  - Restructure Route 304 - will now serve both Franconia-Springfield Metrorail and Lorton VRE (Since completion of the TDP, this service proposal as been put on hold.)
  - Restructure 331/332 I-95 circulators into a new Route 333 (Since completion of the TDP, this proposal will be labeled as two routes – Routes 333 and 334.)
  - Re-designate Route 380-D as Route 395
  - Increase frequencies on Route 310
  - Decrease frequencies and restructure Route 301
  - Establish new Route 341/342 Springfield Circulator
  - Increase frequencies on Route 401 and create new Route 401 Ltd. Stop
- WMATA Metrobus Routes
  - Replace Route 18R and 18S with a new 18A Franconia-Springfield Metrorail to George Mason University and a new 18B Fair Oaks Mall to Franconia-Springfield Metrorail
  - Modify Routes 18G & P, maintain 18H
  - Restructure and promote Metrobus reverse direction service on Route 18J
  - Eliminate Route 18E/F
  - Maintain TAGS service (Metrobus S80 and S91)
- BRAC-Related Shuttle Services
  - Implement two new shuttle services to provide connections from the Lorton VRE Station to Fort Belvoir and to Fort Belvoir North.

The Fairfax Connector TDP also includes the following proposed cross-county / regional routes:

- Fairfax County Parkway BRT/Enhanced Bus service from the Herndon-Monroe park-and-ride to Ft. Belvoir/Richmond Highway
- Four new I-495 HOT Lane express routes
    - Lorton-Tysons
    - Tysons-Fort Belvoir
    - Burke Centre-Tysons
    - Huntington Metrorail-Tysons

The Fairfax Connector TDP prioritizes service improvements into three time periods – short-term (1-3 years) mid-term (4-6 years) and long-term (7-10 years). Improvements that were included in the short-term period include the BRAC shuttle routes, Route 304, Route 309, Route 333 and Routes 171/371. Service plan details for the above-noted improvements are provided in the Fairfax Connector TDP.

Since completion of the TDP, Fairfax County has been proceeding with refinement of TDP recommendations, with many of those refinements noted in the bulleted list above. The I-495 HOT lane projects are to be implemented in conjunction with opening of the HOT lanes (end of 2012). Route alignments for the HOT lane express routes are also undergoing modification. The Lorton-Tysons route is no longer proposed to go through Fort Belvoir North. The Tysons-Fort Belvoir route will now terminate at Franconia-Springfield Station, and the Huntington Metrorail-Tysons route has been put on hold.

5.10.2 PRTC

The PRTC TDP identifies several transit service and capital needs for the I-95 corridor. Many of the service needs reflect recommendations in the *I-95/I-395 Transit/TDM Study* (February 2008). Needs were also identified to service requirements associated with Base Realignment and Closure Commission (BRAC) recommendations for BRAC 133 (Mark Center), Fort Belvoir, and Fort Belvoir North.

OmniRide and Metro Direct service needs associated with the I-95 corridor are as follows:

- Continue to address overcrowding and longer travel times due to congestion by programming contingency hours and buses annually
- Provide improved connectivity between Prince William County and regional activity centers (e.g., downtown Washington, D.C., Pentagon, Crystal City, Tysons Corner, Dulles Airport, Alexandria, Merrifield, Bailey's Crossroads)
- Implement Saturday Metro Direct service connecting eastern Prince William County to the Metrorail system
- Position PRTC to take full advantage of the region's plans for high occupancy toll (HOT) lanes on I-95 and I-495 by planning for modifications to existing routes and new routes
- Address transit needs associated with BRAC recommendations

Omni Link service needs associated with the I-95 corridor are as follows:

- Address transit needs associated with Fort Belvoir BRAC recommendations

Specific service proposals are identified in the PRTC TDP.

It is important to note that PRTC service expansion is contingent on the opening of a second maintenance facility on the western side of the service area. Currently, PRTC has one bus maintenance and storage facility, which is located at the PRTC Transit Center. Constructed in 1996 to 1997, the maintenance facility consists of six service bays plus a steam pit, and the storage yard has the capacity for 128 buses. PRTC's current fleet consists of 133 buses. PRTC is constrained by the site from being able to add any more bus storage. To address the storage capacity problem, PRTC has been storing its contingency bus fleet off-site but in close proximity to the Transit Center for the last several years. Thus, PRTC is at practical capacity with regards to bus storage. In addition to the bus storage capacity issue, the number of available maintenance bays at the facility is becoming a limiting factor. To make room for new vehicles, reduce deadheading costs (miles and fuel), and expand its maintenance capacity, PRTC has been actively pursuing the development of a second maintenance facility on the western side of the service area for the past several years. PRTC proposes to have this second maintenance facility operational in FY 2016. Estimated costs for this facility are $12 million.

Also, since the completion of the TDP in early 2011, PRTC's OmniRide services have been experiencing chronic overcrowding (currently on 17% of its scheduled trips). Only September 5, 2011 the PRTC Board approved an "overcrowding relief" plan that does not require additional subsidy or the acquisition of any additional buses. Three buses that are over 18-years in age and slated for retirement when their replacements arrive have been kept in service for overcrowding relief, with eight morning trips and three afternoon trips added to the schedule. All but two of the additional trips have been added to routes serving the I-95 corridor (Dale City/State Department, Dale City/Pentagon/Navy Yard, and Montclair). Implementation of this plan has substantially improved the situation, but has not entirely eliminated overcrowding.

5.10.3 FRED

FRED's future service improvements are focused on expanding service locally to jurisdictions inside the FRED service area, and do not include providing commuter service. FRED's FY 2011-2016 Six-Year Transit Development Plan has several planned local service improvements that may affect commuters traveling from the southern end of the I-95 corridor, which include:

- Increased span of service on major routes with service beginning at 6:30 a.m. and ending at 9:30 p.m.; and
- VRE feeder service to the proposed VRE Spotsylvania County station.

FRED does not currently provide commuter service and is not positioned to do so in the near future. FRED is constrained with limited funding and service decisions are made individually by each jurisdiction on an annual basis. New service must be requested by the jurisdiction with funding sources identified. Although FRED does provide feeder service to the VRE station in the City of Fredericksburg and a peak period shuttle service between the VDOT North and South Commuter Lots on Garrisonville Road in Stafford County, the availability of parking is a big driver for these routes. Any future service to park-and-ride locations in the region and the existing and proposed VRE stations will largely depend on the availability of parking at these locations.

Potential commuter service needs that exist along the I-95 corridor in Spotsylvania and Stafford counties that were identified in the FRED TDP are as follows:

- **VRE Feeder Service to Stafford County VRE Station –** Currently, FRED is unable to serve the Brooke VRE station in Stafford County due to a bridge impediment. The redesign of this station may provide an opportunity for VRE feeder service to this station. Alternatively, if additional parking is added to this station, FRED service may not be productive enough to warrant service.
- **VRE Feeder Service to proposed Spotsylvania County VRE Station:** FRED's TDP identifies potential VRE feeder service to the proposed VRE station at Hwy 17/Rt. 1 should the need arise.
- **Route 1 Corridor service to Quantico:** Although FRED does not serve Quantico and has no future plans to serve the base, the need for service along the Route 1 Corridor to Quantico does exist. Service to Quantico would need to overcome barriers to accessing the base as well as excessive wait times at the gate.
- **Local service to park and rides as parking limitations and jurisdictional support dictates:** Although FRED recognizes the need for long haul commuter service between the Fredericksburg Region and points north to Washington, D.C., FRED's focus is local service. As the need arises, FRED could provide feeder service to park and rides as requested and funded by Stafford and Spotsylvania counties.

5.10.4 Martz and Quick's

Martz does not currently have any specific future service expansion plans. Availability of funding was noted by Martz staff as being a constraint to adding new service. Martz staff also noted that future service expansion from Spotsylvania and Stafford Counties will need to be contingent on the availability of parking, with the park-and-ride lots on Garrisonville Road (610) and Route 3 (Ukrops) identified as the highest priority. Additionally, commuter service demand is expected to grow to destinations along the corridor outside of Spotsylvania and Stafford counties along I-95 to DC. Martz also recognizes a need for southbound service along the corridor to destinations including Quantico, Fort Meade and Fort Belvoir in the very near future.

Quick's also does not currently have any specific future service expansion plans. Quick's staff expressed a need to focus on adding parking and commuter transit service along the corridor, rather than increasing capacity for single occupancy vehicles. Parking at commuter lots in Stafford and Spotsylvania Counties are at capacity or quickly reaching capacity.

5.10.5 VRE

Active projects underway or planned for implementation by VRE are as follows:

- *Fredericksburg Station*. Renovations at this station are underway and will be completed this summer.
- *Brooke and Leeland Road Station parking expansion.* These projects would add about 200 spaces at each station, and are going out to bid in the near future. The VRE Operations Board will decide on whether to proceed with one or both projects depending on the bid amounts.
- *Cherry Hill 3rd Track*. A 3rd track has been proposed in the Cherry Hill area to improve operational reliability. This project is funded, but on hold pending resolution of funding grant-related issues.

- *Spotsylvania County Station.* Construction of this station/platform and parking is the responsibility of Spotsylvania County. VRE will be responsible for extending a 3rd main track from Fredericksburg south to the station location. The County is proceeding with plan to have this station operational by the end of 2012. The 3rd track is anticipated to be complete in 2013.
- *Platform extensions*. VRE is proceeding with extensions of existing platforms to accommodate 8-car trains. Lorton is funded through construction. Platform extensions are planned, but currently unfunded at Rippon, Brooke and Leeland (the Quantico platform extension is included in the Cherry Hill 3rd track project)
- *Passenger Car Replacements.* VRE is proceeding with plans to replace existing 40+year gallery cars. Development of specs and procurement documents is underway
- *L'Enfant Storage Track.* This project was recently completed and will allow for storage of 1-2 trains (depending on size of consist) in addition to storage yard in DC.
- *Switch project outside L'Enfant Station*. VRE is proceeding with plans to add a switch to allow trains to back up from Union Station and be stored at the new storage track at L'Enfant Station. The project is anticipated to be complete in 2012.
- *Kiss-and-Ride Lot at Woodbridge Station*. This new lot will be located along Route 1 and should be complete by the end of 2011.

Other potential service expansion proposes that have been identified for VRE include:

- Increasing train lengths to increase capacity (requires purchase of additional locomotives and passenger cars);
- Expedite station platform extensions to accommodate 8-car trains;
- Maximize use of Amtrak trains in the corridor through expansion of the cross honor agreement , especially for reverse flow trains;
- Expedite construction of the Spotsylvania station;
- Construct second platforms at Lorton and Rippon

Any expansion of VRE service must be accommodated with expansion of parking at rail stations.

5.10.6 BRAC Related Transit Services

Transportation Management Plans (TMPs) have been developed for the BRAC sites at Mark Center (BRAC-133) and Ft. Belvoir/Ft. Belvoir North. Access to the BRAC-133 Facility at Mark Center will be aided by the I-95 at Seminary Road HOV/Transit ramp. The TMP developed for the BRAC-133 site reflects an estimate of 7 percent of exiting BRAC-133 federal employees coming from Spotsylvania and Stafford Counties. Another 11 percent come from Prince William County and 28 percent come from Fairfax County – with high concentrations of employees coming from Prince William and Fairfax County zip codes that are along the I-95 corridor. Proposed service plans for the BRAC-133 site include:

- Alexandria Transit Company's DASH system is proposed to include shuttle service from King Street Metro to the BRAC-133 Facility at the Mark Center with ten-minute headways during peak periods. The general public can ride the express buses on a fare basis; Department of Defense Mark Center personnel and contractors ride free by showing appropriate ID.

- The Department of Defense (DoD) has proposed funding and operating shuttles from the Franconia-Springfield Metrorail Station to the BRAC-133 facility

- WMATA is planning on implementing the following new services and changes to existing service effective Fall 2011:

    - Mark Center-Pentagon Line, Route 7M
      New express service between the Pentagon and Mark Center via I-395. Will operate every 10-15 minutes from 5:40 a.m. to 7 p.m. DoD employees ride free with I.D.
    - Lincolnia-Park Center-Pentagon Line, Routes 7W, 7X
      Reroute via Mark Center and modify routing/stops in Southern Towers
    - Foxchase-Seminary Valley Line, Route 8W
      Extend from Seminary Rd. & Library La. to Mark Center

    Also, Routes 7A and 7F which currently operate via Mark Center every 30-60 minutes seven days a week will continue with no changes in route or schedule at this time. DoD employees with I.D. will be allowed to ride free on any 7 line bus (7A, F, M, W, X) operating via Mark Center.

    Additional possible changes for December 2011 or later include:
    - Extend Route 28X Leesburg Pike limited stop service from Baileys Crossroads to Mark Center
    - Modify Routes 25C,D and/or 28F,G to operate via Mark Center
    - All routes starting/ending at Southern Towers (7B,D,E,Y) extend to start/end at Mark Center

Transit plans for Fort Belvoir and Fort Belvoir North include:

- Recently implemented internal circulator at Fort Belvoir. It is a 15-passenger van with 30-minute headways, since the installation plans to start small and build up. There is a bus stop at Pence Gate on Belvoir Road near the new Hospital.
- The Department of Defense (DoD) has proposed funding and operating shuttles from the Franconia-Springfield Metrorail Station to Fort Belvoir North
- A publicly-operated shuttle is also proposed between Franconia-Springfield Station and Fort Belvoir. This shuttle would enter onto the base.
- The existing REX route will run extended evening service until 11 p.m. for Fort Belvoir hospital late night shifts.

5.10.7 Metrorail Station Bus Bays

At the Pentagon Station, there are physical limitations for expansion of bus bays. The DoD is in the process of analyzing bus activity at the Pentagon Station bus bays. Fieldwork will be completed this summer to determine bus bay utilization during peak periods. It is also important to note that WMATA has TIGER money for two additional bus bays at this station, and is currently looking into locations and developing concepts. The TIGER grant money is also being used to investigate the potential of adding up to three additional bus bays at the Franconia-Springfield Station.

5.10.8 Other Regional/Local Transit Projects

In addition to the service and facility expansion plans described above, it is also important to be aware of other regional transit initiatives and their potential impacts on regional transit services that originate from the I-95 corridor. Those projects include:

- *Metrorail's Silver Line (2014)*. This new rail line will include four stations in the Tysons Corner area, with service initially extended west to Wiehle Avenue (2014), and eventually to the Dulles Airport and Loudoun County (2017).
- *Crystal City and Potomac Yard Transitway (2013).* One lane on Crystal Drive and Clark Drive will be converted to bus use only. This project proposes the consolidation of bus stops in the Crystal City area, which will impact commuter operations, such as PRTC, Quick's and Martz.
- *Management of Downtown D.C. Slugging Locations.* DDOT has been working to manage slugging operations within downtown Washington, D.C. and has developed a plan (November 2010) that recommends new locations for slugging pick-up locations.
- *14th Street Bridge.* The Federal Highway Administration has also begun work on an Environmental Impact Statement (EIS) to determine impacts associated with potential mobility improvements for the 14th Street Bridge.

6.0 Corridor Transit Park-and-Ride Lots

As noted in the prior sections, there are several park-and-ride lots in the I-95 corridor that are well utilized by transit riders, dynamic ridesharing (sluggers), vanpoolers and carpoolers. This section of the Technical Memorandum presents information pertaining to existing corridor park-and-ride lots.

6.1 Fairfax County Lots

VDOT owns or leases several lots in the Fairfax County portion of the I-95 corridor. This is complemented by Fairfax County-owned park-and-ride lots and other private lots with leasing arrangements. VDOT enters into lease agreements with the county when VDOT is the party paying the lease. Otherwise, the county executes an agreement with the private land owner. Over 2,800 spaces are available in the Fairfax County portion of the I-95 corridor. Park-and-ride lots and utilization counts are presented below in **Table 6-1.** Lot locations are shown in **Figure 6-1**.

Table 6-1:
Fairfax County Park-and-Ride Lots

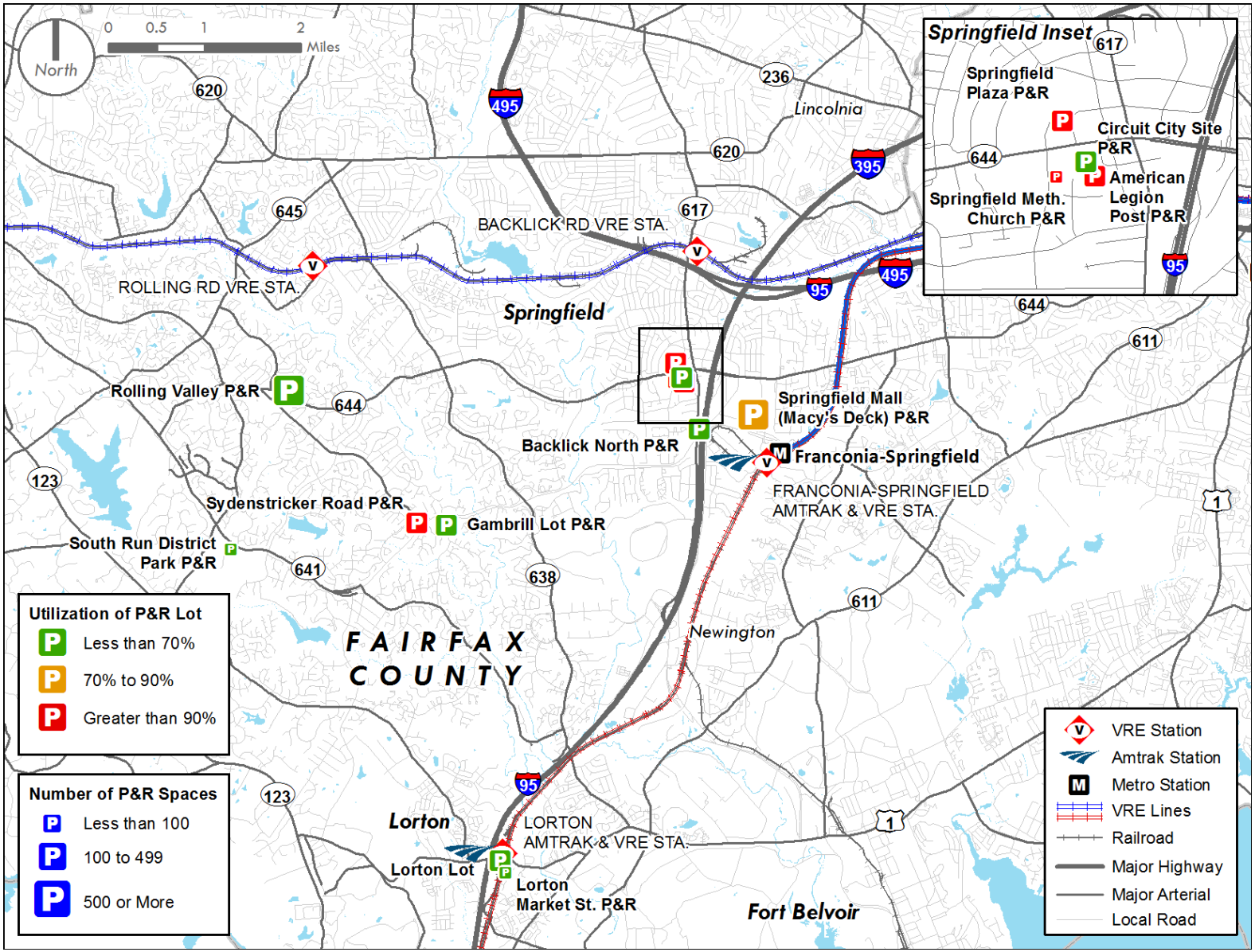
Lots Arrangment	Lot Name	Lot Location	Lot Capacity	Lot Occup.	Percent Occup'd.
VDOT Lots	Rolling Valley	Old Keene Mill Road and Shiplett Boulevard	664	463	70%
	Backlick North	6831 Backlick Road, Springfield	279	109	39%
	Gambrill Lot	Gambrill Road at Hooes Road	225	137	61%
	Lorton Lot	Gunston Cove Road at Lorton Road	170	25	15%
	Sydenstricker Road	Sydenstricker Road at Hooes Road	170	174	102%
	Subtotal		1,508	908	60%
Fairfax Co. Lots	Circuit City Site	7039 Old Keene Mill Road, Springfield	270	130	48%
	South Run District Park	Reservation Dr. off of Fairfax County Parkway	52	0	0%
	Subtotal		322	130	40%
Other Lots	Springfield Mall - Macy's Deck	Spring Mall Dr. Macy's garage	500	410	82%
	Springfield Plaza	Bland Street btwn Old Keene Mill Rd and Amherst	254	254	100%
	American Legion Post	Amherst Ave. at Springfield Blvd.	100	100	100%
	Lorton Market Street	9405 Lorton Market St., Lorton	65	3	5%
	Springfield Methodist Church	7047 Old Keene Mill Road	57	57	100%
	Subtotal		976	824	84%
TOTALS			**2,806**	**1862**	**66%**

Occupancy counts obtained from VDOT (2010 counts)
Recent observations indicate that Circuit City lot utilization is approaching 100%

Most of the lots identified in **Table 6-1** are served by transit. Transit connections at the larger lots are as follows:

- Gambrill Road – FC 305, Metrobus 18R
- Backlick North – FC routes 310, 331, 332, 380D
- Rolling Valley – FC Route 310, WMATA Routes 18G,J,P,R,S
- Springfield Mall – FC 321, 322, 331, 332, 401, WMATA routes S80, S91
- Springfield Plaza – FC Routes 331, 332, WMATA Route 18E
- Sydenstricker Road – FC Route 305

Figure 6-1: Fairfax County Park-and-Ride Lots in I-95 Corridor



6.2 Prince William County

There are over 7,700 spaces within the I-95 corridor in Prince William County. Park-and-ride lot locations, lot capacities, utilization rates and transit route connections are presented in **Table 6-2**. Lot locations are illustrated in **Figure 6-2**. Most of the utilization counts were provided by PRTC and supplemented with VDOT counts when necessary. As noted in this table, lot utilization tends to be highest at the larger VDOT-owned and maintained lots, with close to a 90 percent occupancy rate. It is important to note that the list of park-and-ride lots in Table 6-2 does not include a few lots that were identified in VDOT's 2010 lot inventory, for those lots in question do not have a formal lease arrangement with Prince William County, nor do they appear to be actively used by commuters.

VDOT and Prince William County have been working to expand park-and-ride lot opportunities over the past several years. The most recent expansion was at the Route 234/Route 1 lot, with the addition of almost 500 spaces. PRTC did, however, recently (February 14, 2011) lose several hundred spaces at Potomac Mills, with spaces at this site limited to 275. PRTC has been encouraging commuters to park at nearby underused commuter lots, in particular lots west of Minnieville Road, such as Dale City, Hillendale and Lindendale.

It should be noted that the 375 spaces at First Baptist Church lot are currently being used as a stop-gap measure until the proposed Telegraph Road lot (discussed in Section 6.5) is completed, at which time the formal agreement for use of this lot will be terminated. Use of this lot has been very low, primarily due to its location away from I-95.

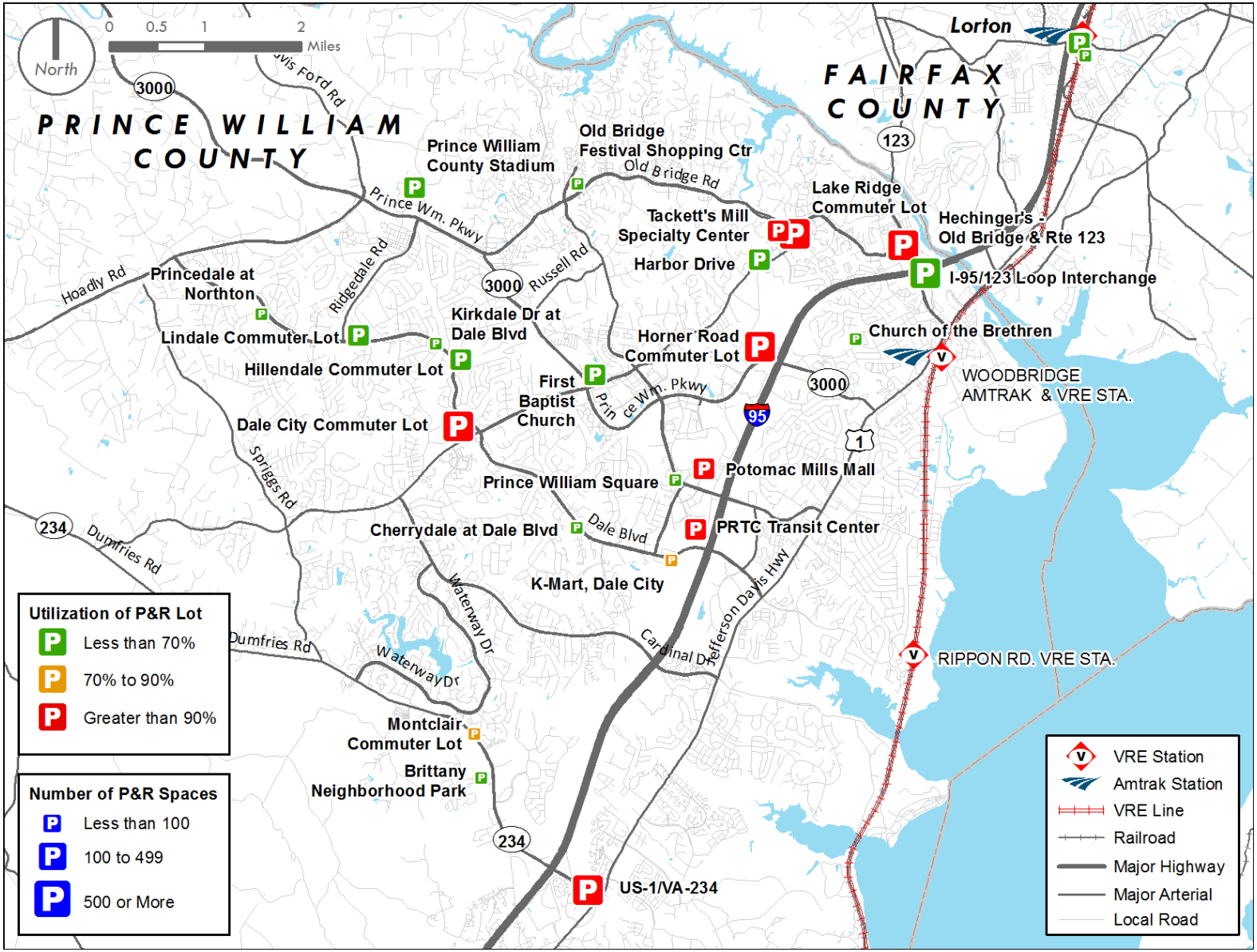
Table 6-2
Prince William County Park-and-Ride Lots

Lots Arrangment	Lot Name	Lot Location	Lot Capacity	Lot Occup.	Percent Occup'd.	Dale City OmniRide DC-R	Rosslyn/ Ballston RB-R	Pr Will. Metro Dir. P-MD	Montclair OmniRide MC-R	Route 1 OmniRide R1-R	LakeRidge OmniRide LR-R
VDOT	Horner Road Commuter Lot	Prince William Parkway at I-95	2,363	2,488	105%	X	X	X			
Lots	US1/VA 234	VA 234 & US 1	843	883	105%				X	X	
	Lake Ridge Commuter Lot	Minnieville Road & Old Bridge Road	628	632	101%	X*					X
	Dale City Commuter Lot	Minnieville Road and Dale Boulevard	580	544	94%	X	X		X		X
	Hechinger's - Old Bridge & Rte 123	Intersection Rte 123 and Old Bridge Road	580	598	103%					X*	X
	I-95/123 Loop Interchange	Intersection I-95 and Rte 123, Exit 160	580	292	50%					X*	X
	Hillendale Commuter Lot	Hillendale Road and Dale Boulevard	248	73	29%	X	X				X
	Lindendale Commuter Lot	Lindendale Road and Dale Boulevard	216	100	46%	X	X				
	Harbor Drive	Harbor Drive and Minnieville Road	200	0	0%	X*	X				
	Montclair Commuter Lot	VA 234 North of Stockbridge Drive	50	38	76%				X		
	Princedale at Northton	Princedale Dr, W of Dale Blvd	43	0	0%						
	Subtotal		6,331	5,648	89%						
Proffered	Potomac Mills Mall	Potomac Mills Mall across from Pier I imports	275	275	100%	X		X			
Lots	Tackett's Mill Specialty Center	center	170	169	99%	X*					X
	Brittany Neighborhood Park	Exeter Drive off VA 234	85	50	59%				X		
	Old Bridge Festival Shopping Center	Old Bridge Road and Smoketown Road	56	56	100%	X*					X
	Prince William Square	Smoketown Road and Gideon Drive	45	0	0%	X		X			
	Subtotal		631	550	87%						
Formal	Prince William County Stadium	Off Davis Ford Road at Stadium	190	58	31%						
Agrements	K-Mart, Dale City	Intersection Dale Blvd & Gideon Dr.	90	75	83%						
	First Baptist Church	13600 Minnieville Road	375	20	5%		X				
	Subtotal		655	153	23%						
Other Lots	PRTC Transit Center	Potomac Mills Road at Telegraph Road	124	198	160%	X		X			
	Subtotal		124	198	160%						
TOTALS			**7,741**	**6,549**	**85%**						

Most occupancy counts obtained from PRTC and reflect 2011 occupancy rates. Those counts shown in red were provided by VDOT and reflect 2010 occupancy rates.

NOTE: PRTC Transit center lot capacity does not reflect spaces available at an adjacent unpaved lot (thus the reason why lot occupancy shown is much higher than lot capacity).

Figure 6-2: Prince William County Park-and-Ride Lots in I-95 Corridor



6.3 Spotsylvania and Stafford County Lots

VDOT-owned lots in Spotsylvania and Stafford Counties are as follows:

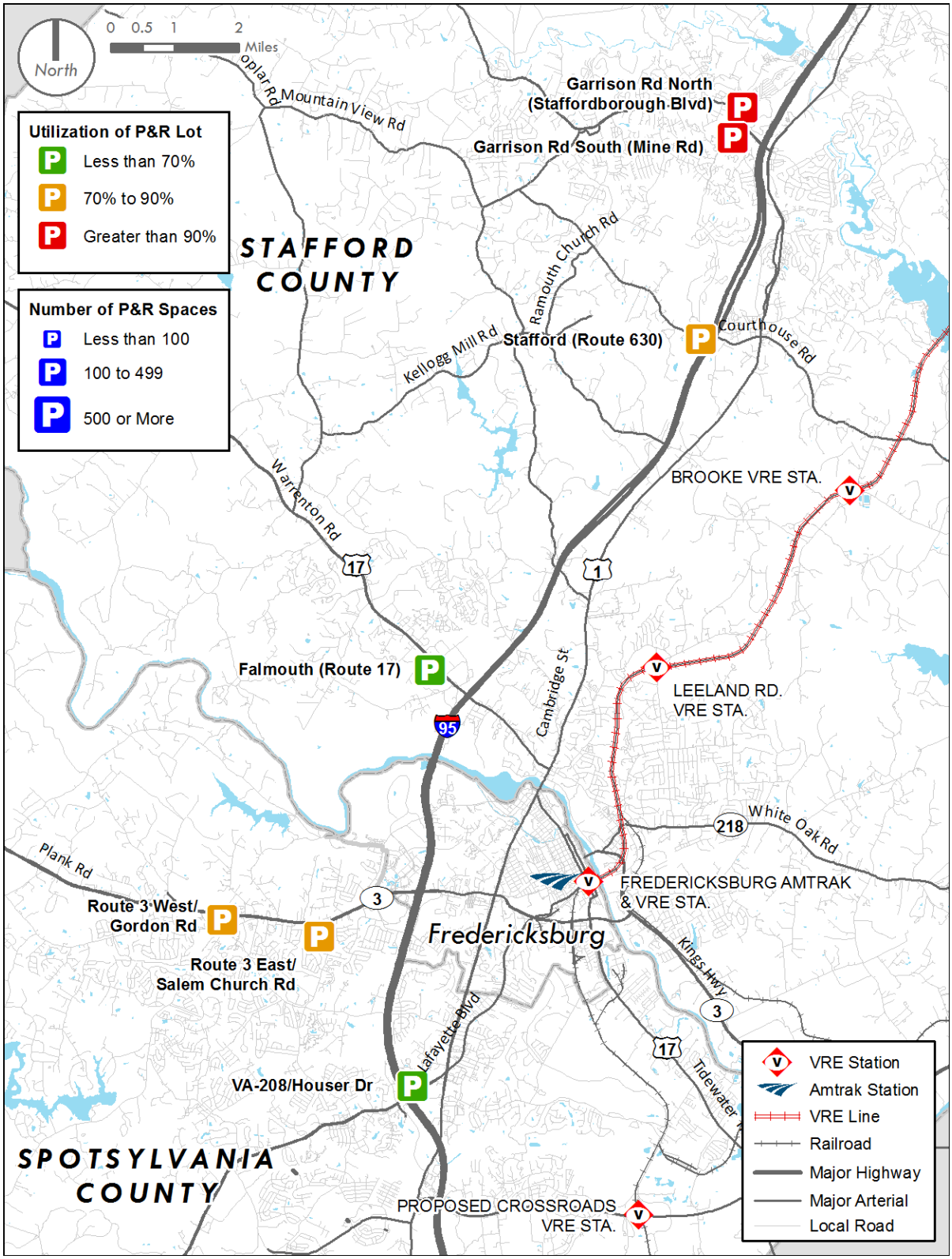
- Garrisonville Road North (Staffordborough Blvd.) – 825 spaces
- Garrisonville Road South (Mine Road) – 750 spaces
- Stafford (Route 630) - 750 spaces
- Falmouth (Route 17) – 1,035 spaces
- Route 3 West / Gordon Road – 645 spaces
- Route 3 East / Salem Church Road – 705 spaces
- VA 208 / Houser Drive – 815 spaces

Park-and-ride lot utilization rates were not available from VDOT for these lots. Parking counts were, however, available from GWRideConnect. The two Garrisonville Road park-and-ride lots are consistently over capacity. The two Route 3 lots are consistently over 90 percent occupied. The Falmouth (Route 17) and VA 208 lots are typically under 75 percent occupied. **Figure 6-3** identifies park-and-ride lot locations and observed lot utilization rates in Stafford and Spotsylvania Counties.

6.4 Park-and-Ride Lot User Characteristics

In 2006, an on-board survey was conducted of OmniRide passengers. Results from that survey are not available for specific I-95 corridor, but county wide, determined that about 7 percent of OmniRide passengers came from other than Prince William/Manassas/Manassas Park. No survey data has been discovered for Stafford or Spotsylvania County park-and-ride lots. A license plate survey was also conducted at Fairfax County park-and-ride lots. This study found that about ½ of all trips originate within 5 miles of the park-and-ride lot, with a slightly up-stream point of origin. Park-and-ride demand was greatly driven by the level of transit service provided.

Figure 6-3:
Stafford County and Spotsylvania County Park-and-Ride Lots in I-95 Corridor



6.5 Destination End Park-and-Ride Lots

The Franconia-Springfield Metrorail Station is the end-of-the-line station for the Blue Line, and operates near capacity. According to the 2009 *WMATA Real-Time Parking Information Feasibility Study,* the station has approximately 5,120 parking spaces, of which more than 4,800 were full at noon. This equates to a 94.5 percent occupancy rate. The Springfield Mall Macy's garage is used by many Metrorail commuters for supplemental free parking.

6.6 Programmed and Planned Park-and-Ride Lot Expansion

VDOT is proceeding with the following park-and-ride lot expansion projects for the I-95 corridor:

- *Telegraph Road* – Construction of a new 700-space park-and-ride lot, located off of Telegraph Road, just north of Caton Hill Road directly across from the Horner Road lot. Construction is proposed by the end of 2012. This lot will be located on public right-of-way. Construction costs are estimated to be $8 million.
- *Saratoga Lot* – Construction of a new 600-space park-and-ride lot near Fort Belvoir North, in the southeast quadrant of Fairfax County Parkway and Rolling Road and will include access to the eastbound on-ramp onto Fairfax County Parkway. Parking lot is currently in design. Construction is proposed by 2013. This lot will be located on public right-of-way. Construction costs are estimated to be $3 million.
- *Route 3/Gordon Road* - Up to 1,000 additional spaces is proposed. Two potential sites have been identified (one adjacent to the existing Gordon Road lot and one about ½ mile away) and project scoping will begin soon. Anticipated opening year is 2017. Cost identified in VDOT's six-year improvement program as $3.8 million, but actual cost may be higher. FAMPO's planned toll road/interchange with Route 3 has the potential to impact this lot.
- *Garrisonville Road/Staffordborough Blvd.* – Approximately 1,000 additional spaces are proposed. Design work is in process, with construction to be completed by 2015. Total estimated cost is $5.9 million.
- *Spotsylvania County VRE Station* – Up to 1,000 spaces at the planned VRE train station in Spotsylvania County.

In addition to the above-noted projects, Prince William County recently entered into a lease arrangement with First Baptist Church on Minnieville Road for 375 spaces. As previously noted, these spaces are currently being used as a stop-gap measure until the Telegraph Road lot is completed.

In total, VDOT's current park-and-ride lot expansion plans reflect 1,300 new spaces in the northern portion of the I-95 corridor (Prince William and Fairfax Counties) and 3,000 new spaces in the southern portion of the corridor (Stafford and Spotsylvania Counties). These totals do not include VDOT's intent to add up to 1,200 new spaces at the Horner Road lot through expansion on the south end of the lot (project is proposed, but no planning/design work has commenced on this project, and there is no schedule in place to advance this project). Nor does it include the potential addition of 180 surface spaces (more if a parking structure is constructed) at the Springfield "Circuit City" lot. Expansion of this lot requires the purchase of two parcels to complete expansion of this existing park-and-ride lot to a total of 450 surface spaces, or more should a parking structure be constructed.

The prior *I-95/I-395 Transit and TDM Study* identified the following specific park-and-ride lot expansion needs:

- 450 spaces in the Springfield/Lorton subarea, all were included in the Fiscally-Constrained Plan
- 1,250 spaces in the Massaponax/Spotsylvania County area, of which 475 were included in the Fiscally Constrained Plan
- 2,125 spaces in the Stafford County area, all were included in the Fiscally-Constrained Plan
- 2,500 additional spaces in Prince William County, of which 1,450 were included in the Fiscally-Constrained Plan
- 1,500 spaces at VRE stations dedicated to stations at the southern end of the Fredericksburg Line (Brooke, Leeland, and Fredericksburg), all were included in the Fiscally-Constrained Plan.
- 1,925 spaces at the Franconia-Springfield Station (not included as part of the study effort).

In total, the prior *I-95/I-395 Transit and TDM Study* identified a need for 9,700 total spaces, of which 6,000 were included in the Fiscally-Constrained Plan.

VDOT's park-and-ride lot expansion plans are addressing many of the expansion needs identified in the *I-95/I-395 Transit and TDM Study*. VDOT park-and-ride projects, as they relate to prior *I-95/I-395 Transit/TDM Study* recommendations, are described below:

- Expansion of the "Circuit City" lot in Springfield will meet the 450 space need that was identified for the Springfield/Lorton area
- As noted in the above list, VDOT is about to commence design for up to 1,000 spaces at the Garrisonville Road lots (VA 610), thus addressing the need for 1,050 spaces identified n the prior study
- VDOT has recognized the need to expand the Horner Road lot with up to 1,200 additional spaces, which is consistent with findings from the prior study
- The lease of 375 spaces at First Baptist Church expands parking opportunities in the Potomac Mills area. The planned construction of 700 spaces at Telegraph Road will help replace the parking spaces recently lost at Potomac Mills.
- VDOT is planning to construct 1,000 spaces at the Spotsylvania Station, and as noted in the prior section, VRE is proceeding with plans to construct approximately 200 additional spaces at both the Leeland Road and Brooke VRE stations. These projects address the need for VRE parking lot expansion that was addressed in the prior study

It is important to note that FAMPO has recently conducted a park-and-ride lot feasibility study. The FAMPO study is based on needs identified in the FAMPO 2035 Long-Range Transportation Plan, which identifies a need for more park-and-ride spaces in Stafford and Spotsylvania County than what was identified in the *I-95/I-395 Transit and TDM Study*. The park-and-ride study identified six general "nodes" where new or expanded park-and-ride lot facilities were needed. Node locations and parking needs were:

1. Garrisonville Road (Route 610) –need for 3,650 spaces identified
2. Jackson Gateway area in Massaponax – need for 1,200 spaces identified
3. Proposed Celebrate Virginia Interchange – need for 1,100 spaces identified
4. Fredericksburg VRE station area – need for 800 additional spaces identified
5. Spotsylvania County VRE Station – need for 1,000 spaces identified
6. Route 3 East – need for 500 spaces identified

The FAMPO study identified potential parcels, and included an evaluation of each parcel.

Finally, it will be important that any expansion or construction of park-and-ride facilities in the I-95 corridor take into consideration vehicular access needs to/from the park-and-ride lots on the adjacent roadways, and bus access needs within the park-and-ride lot and on adjacent roadways. Corridor bus operators will also need to adjust service plans to provide service to these planned new facilities. It may also be appropriate to consider structured parking facilities at some locations as a means to minimize land acquisition costs, pedestrian walking requirements, and the need for multiple bus pick-up/drop-off locations at a park-and-ride site.

7.0 Transportation Demand Management Programs

This section describes the following regional and local Transportation Demand Management (TDM) programs and initiatives in the I-95 corridor.

- Telework Programs
- Slugging/Dynamic Ridesharing
- Commuter Connections Network of TDM Agencies
    a. Local Motion – City of Alexandria
    b. Fairfax County Transportation Services Group (FCTSG)
    c. OmniMatch – Potomac and Rappahannock Transportation Commission (PRTC)
    d. GWRideConnect – George Washington Regional Commission (GWRC)
- Some Regional Marketing and Incentive Programs
- TDM Plans for BRAC Sites

7.1 Telework Programs

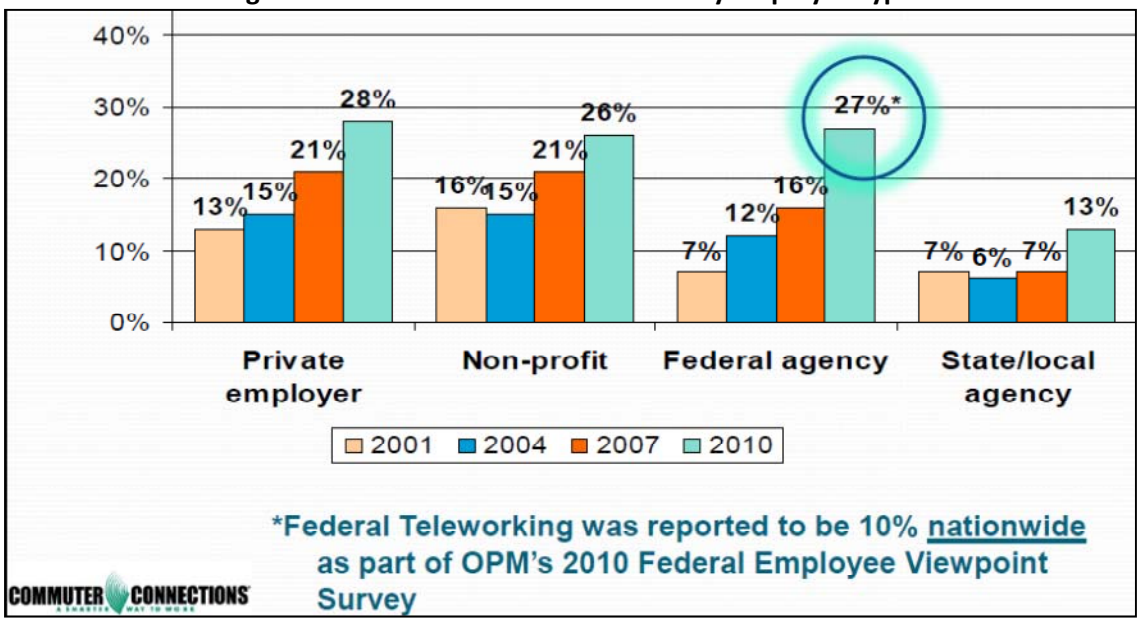
Telework programs give employees and managers the option of working at a location other than the usual workplace on a full-time, part-time, or temporary basis. Potential work locations include home offices, telework centers, or satellite offices. Employers may have a formal telework policy and program, or may allow informal telework arrangements.

The 2010 MWCOG State of the Commute survey found that a quarter of regional commuters, or over 600,000 workers, teleworked at least occasionally. Of these, 291,000 teleworkers lived in Northern Virginia[1]. Half of the teleworkers regularly teleworked at least one day a week. About 17 percent telework three or more days per week. Telework has grown among all employer types, with the Federal agencies showing the greatest increase in rate of teleworking (**Figure 7-1**). Half of the current teleworkers were offered a formal program by their employer.

Teleworking has great potential in the region. In addition to the 600,000 regional employees who currently telework at least occasionally, an additional 500,000 employees (or 21%) said they "could and would" telework, i.e. their job responsibilities could be performed through telework and they would like to telework if given the opportunity (**Figure 7-2**). For Northern VA, potential new teleworkers number about 61,000.

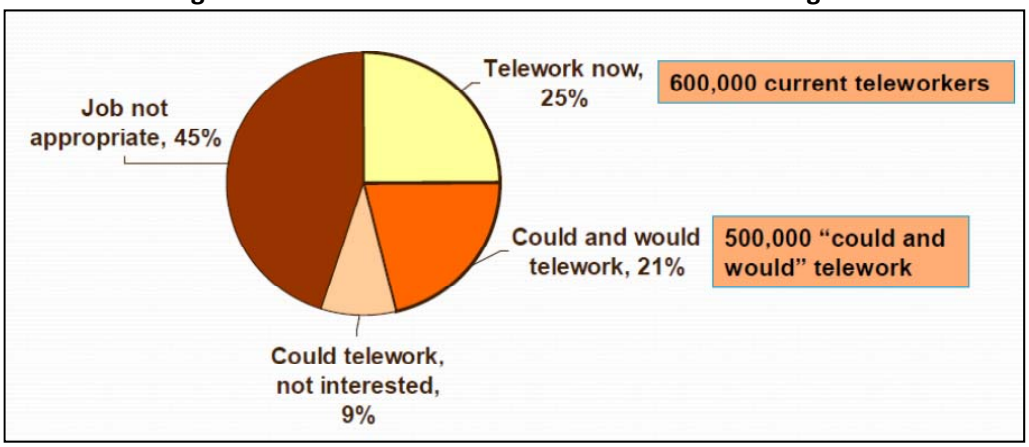
[1] Number of teleworkers tracked by local jurisdictions is listed with the description of each local TDM program later in this section.

Figure 7-1: Historical Rate of Telework by Employer Type



Source: 2010 MWCOG State of the Commute Survey

Figure 7-2: Potential for Telework in the MWCOG Region

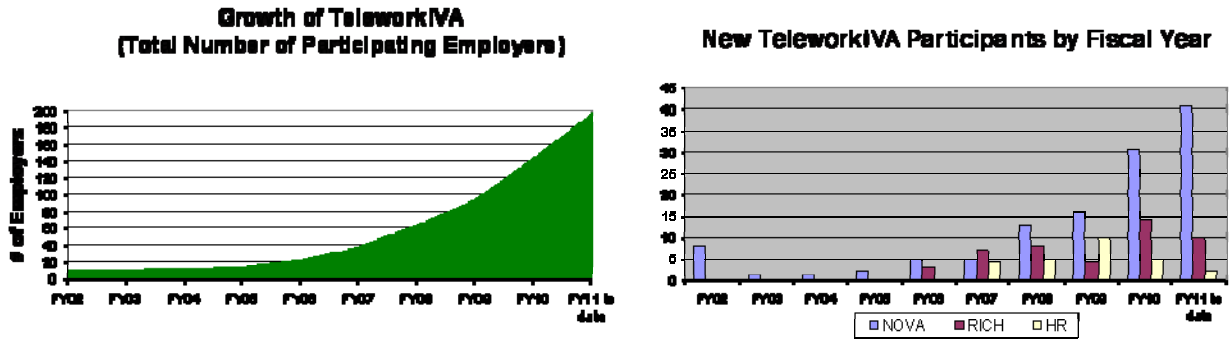


Source: 2010 MWCOG State of the Commute Survey

7.1.1 Telework!VA

The Telework!VA program by DRPT provides telework training and financial incentives for Virginia businesses to establish or expand telework programs for their employees. Through this program, businesses may obtain free assistance to develop telework policies and qualify for up to $35,000 in reimbursements for various expenses, including equipment leases, telework center space, technical assistance toward program development and equipment installation, and training for teleworkers, non-teleworkers, and management. As seen in the charts below (**Figure 7-3**), participation in the Telework!VA program has increased exponentially in recent years, especially in Northern Virginia.

Figure 7-3: Telework Participants Growth Trends



In 2011, the Virginia General Assembly passed a telework tax credit to encourage more telework participation by employers in Virginia. The tax credit covers expenses incurred by the employer to enable employees to begin to telework. The tax credit is available for 2012 and 2013. An employer may receive a tax credit up to $50,000. DRPT is working with the Department of Taxation to develop the rules and procedures for employers to qualify for the tax credit. Through its Telework!VA program, DRPT will promote the tax credit and assist employers with the implementation of a qualifying telework program.

7.1.2 Telework Centers

As of March 31, 2011, government funding for the GSA-managed Telework centers was removed. The telework centers in the study area that remain open as privately operated facilities are:

- The Fairfax Telework Center operated by ***GMU's Mason Enterprise Center***
- Three centers operated by GWRC, i.e. the Fredericksburg Regional Telework Center, Fredericksburg Telework Center North (also known as the Stafford Telework Center), and the Woodbridge Telework Center.

7.1.3 Federal Telework

New legislation also supports telework for federal employees. The Telework Enhancement Act of 2010 (HR 1722) requires each federal agency to designate a Telework Managing Officer, and monitor progress towards a goal of 20 percent of eligible federal workforce teleworking an average of one day per week.

Federal telework is supported by Telework Exchange, a public-private partnership focused on demonstrating the tangible value of telework and serving the emerging educational and communication requirements of the Federal teleworker community. The organization facilitates communication among Federal teleworkers, telework managers, and IT professionals. In June 2011, Telework Exchange published the "Federal Telework Progress Report: Making the Grade?," which gauges Federal telework progress against the Telework Enhancement Act of 2010 requirements, and notably the provisions within 180 days to build the foundation for a sustainable telework program. According to the report, the majority of TMOs say they will meet the deadline to establish a telework policy (86 percent), determine the eligibility for all employees of the agency to participate in telework (84 percent), and notify all agency employees of their eligibility to telework (76 percent). Additionally, the majority of agencies surveyed have training programs in place. The report also finds that while telework participation is on the rise,

telework leaders agree that the top telework challenges are capturing data and managing program metrics (49 percent), management support (46 percent), and technology support (38 percent). Additionally, Federal agencies have some ground to cover on updating their policies for purchasing telework-enabling technology set forth by the Office of Management and Budget. About 70 percent will still need to update their policies to meet the agency's July 2011 deadline.

7.2 Slugging

"Slugging" is a colloquial term that has developed to describe the informal dynamic ridesharing activity occurring in the northern Virginia I-95 corridor. A "slug" describes an individual who seeks to ride as a passenger in a private auto traveling in the HOV lanes. Drivers seek these "slugs" to legally travel in the HOV lanes and are referred to as "bodysnatchers".

A 2006 study by VDOT estimated that a.m. slugs along the I-95 corridor numbered about 6,450, which was about twice the number estimated in 1999 for this corridor. The 2006 estimates were based on a.m. peak counts at 15 slug line locations along the Virginia I-95 corridor (including slug lines in Fairfax and Prince William counties in the VDOT Northern Virginia District as well as locations in Stafford County and Fredericksburg in the VDOT Fredericksburg District). The 1999 study which was based on p.m. counts at four slug lines in downtown Washington, D.C. **Figure 7-4** shows the number of sluggers at each park-and-ride lot in the 2006 study, and **Figure 7-5** and **Figure 7-6** show the origins and destinations of sluggers (based on findings in the 2006 VDOT study). As noted in these figures, over one half of sluggers originate in Prince William County. One third of all sluggers are destined to the Pentagon.

Figure 7-4: Number of Sluggers by Lot

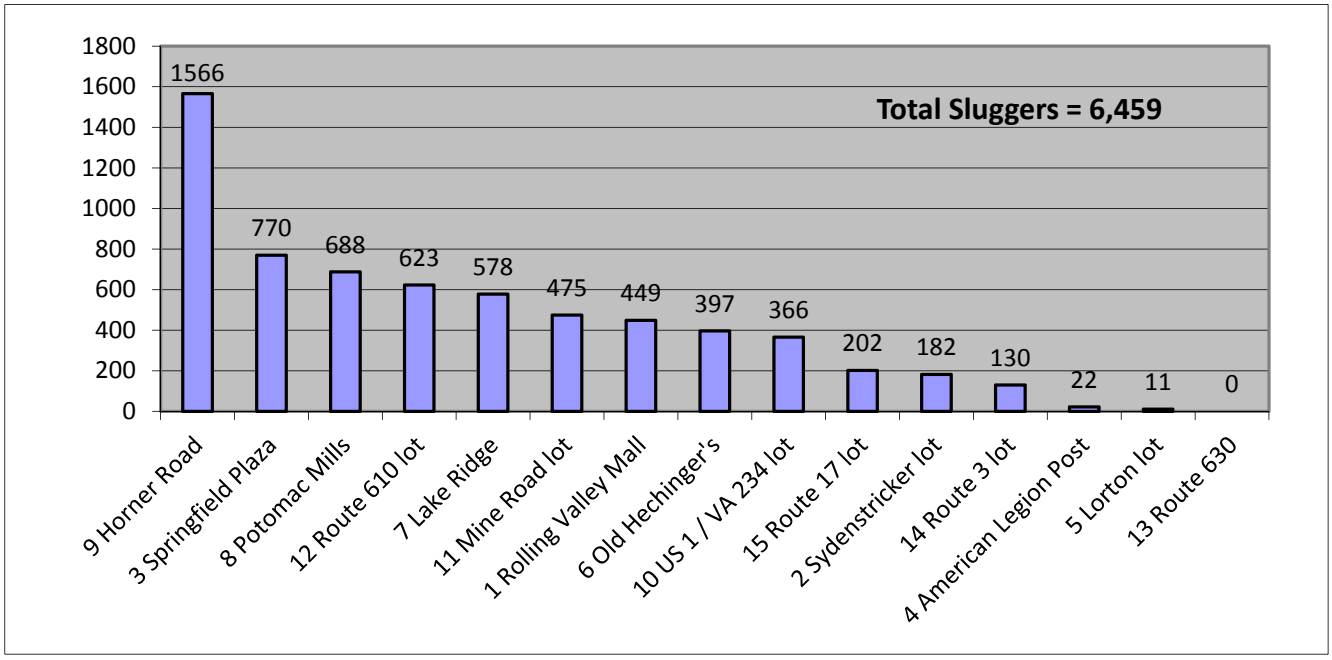


Figure 7-5: Jurisdiction of Origin of Sluggers

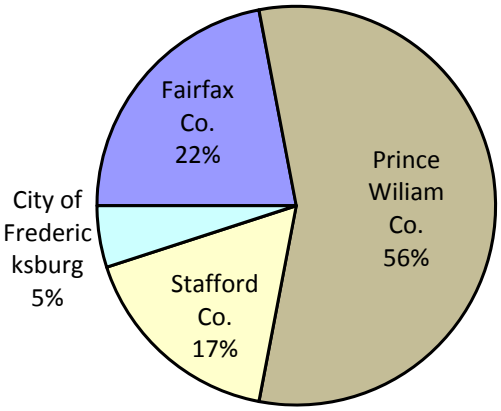
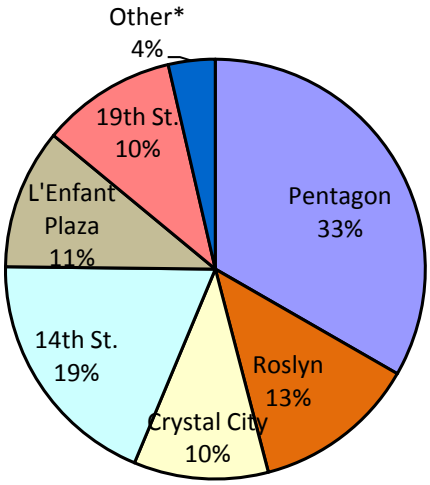


Figure 7-6: Destinations of Sluggers



In 2010, VDOT conducted a study of five park-and-ride lots in Northern VA: Route 610/Stafford, Mine Road/Stafford, Route 234/Dumfries, Route 17/Fredericksburg, and Route 3, Gordon Road/Fredericksburg. The study profiled sluggers' commute patterns and behaviors. The study found that about 9 out of 10 sluggers commute on I-95/I-395 four or five days a week and for most of them, slugging is their typical mode of commute. Sluggers are "early birds" and tend to start their commutes (i.e., leave home) before 6:00 a.m., especially sluggers using the Fredericksburg lots. Typically, slug drivers pick up just enough slug riders to use the HOV lanes on I-95 and pick up occurs at a single lot. Many sluggers are going to the Pentagon, Washington, D.C., or Crystal City. About 25 to 33 percent of sluggers change to another mode of transportation to get to their final destination, with a higher percentage (49%) from the Route 3/Fredericksburg lots (e.g., Metrorail). Those who change to another mode most often take Metrorail. Depending upon the lot, about 5 percent to 20 percent of slugs use a different mode of transportation in the afternoon, with bus being the most frequent choice and a few riding VRE.

There are six areas within Washington, D.C. that are typically used by afternoon pick-ups. Those locations are: 14th Street & New York Ave., 14th Street and the Commerce Department, 14th Street and Constitution Avenue, 14th Street and Independence Avenue, L'Enfant Plaza and 19th Street/F Street. There are two locations in Rosslyn that are typically used by sluggers for afternoon pick-ups: the Lee Hwy service road near Ft. Meyers Drive and N. Kent Street, north of Wilson Avenue. The other major pick-up location is at the Pentagon.

7.3 Commuter Connections

Commuter Connections is a regional network of transportation organizations coordinated by the MWCOG, and provides information on the commute options for those who live or work in the Metropolitan Washington, D.C. area. Commuter Connections serves as an umbrella organization across

member jurisdictions for regional awareness and marketing services related to improved air quality and reduced automobile emissions. Commuter Connections is a program of the National Capital Region Transportation Planning Board at the MWCOG and is funded by the District, Maryland and Virginia Departments of Transportation as well as the U.S. Department of Transportation. Many of the local Commuter Connections members receive grant funding directly from their respective State government.

Commuter Connections representatives provide commuter and employer services assistance with developing and implementing alternative commute programs and incentives including:

- Computerized Ridematching for carpools and vanpools
- Guaranteed Ride Home program registration and information
- Transit information, including SmartBenefits
- On-site rideshare promotions and displays
- Bicycle commute program development
- Live Near Your Work initiative
- Work schedule alternatives development
- Emergency Preparedness plan development
- Air Quality Action Days program development
- New employee commute options information
- Corporate relocation assistance
- Training on-site transportation managers
- Commuter program coordination with nearby companies
- Parking Management strategies based on an evaluation of the current parking situation
- Telework program development

It is widely acknowledged that reduction in commute trips is best achieved by providing commuter benefits through employers. Commuter Connections has defined levels of employer participation based on TDM strategies implemented by an employer, along with the expected reduction in employee trips at each level (**see Table 7-1**). For the number of employers in the study area participating at each level, see the employer services section under each local program below.

Table 7-1: Commuter Connections' Levels of Employer Participation and Impacts

Level	Likely Range of Trip Reduction
Level 1-Bronze	0% to 1%
Level 2-Silver	up to 3% without Telework/ Compressed Work Schedules (CWS) up to 9% with Telework/CWS
Level 3- Gold	2% to 5% without financial incentive/disincentive and Telework/CWS 5% to 20% with financial incentive/disincentive and Telework/CWS
Level 4- Platinum	2% to 8% without financial incentive and Telework/CWS up to 30% with financial incentive and Telework/CWS

Source: MWCOG Commuter Connections Item #9

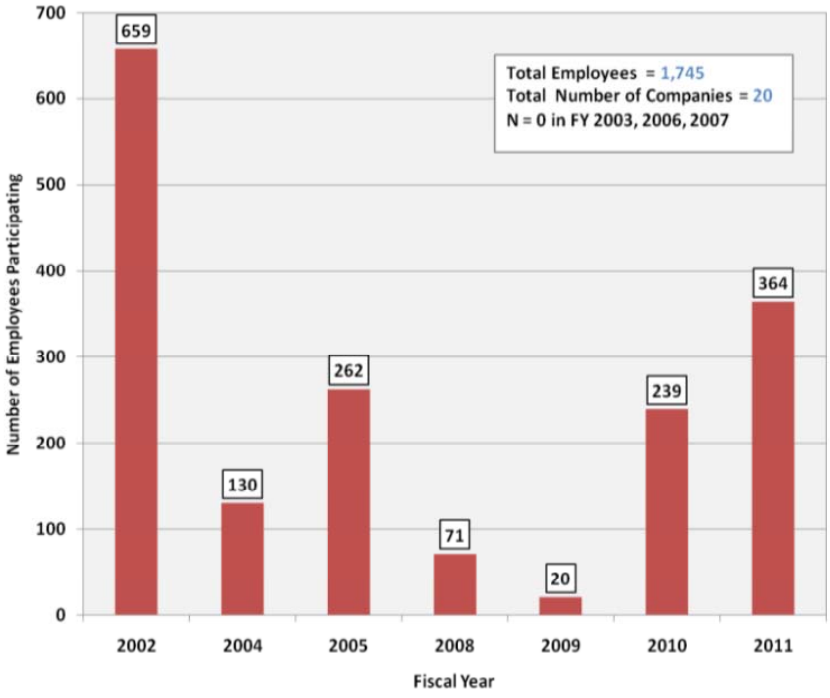
7.3.1 Local Motion – City of Alexandria

Local Motion is the City of Alexandria's local TDM program that serves the businesses and residents of Alexandria. The City of Alexandria is a member of the Commuter Connections network. While the program began with carpool/vanpool services, it now implements various TDM strategies including

incentivizing transit use (i.e., offering transit subsidies), disincentivizing drive-alone commuters, and providing additional funding for shuttle bus service, registration fees for car sharing, bus shelter construction and maintenance, bicycle lockers and parking facilities for carpoolers/vanpoolers. Based on the Local Motion Long-Range Transportation Demand Management (TDM) Plan 2011-2036, the primary programs currently offered include:

- Employer Services: As of March 2010, there were 53 Level 1 employers, 35 Level 2 employers, 76 Level 3 employers, and 23 Level 4 employers in the program.
- Carshare: For residents, the City provides the initial application fee and the first year of membership. Businesses receive up to $50 from the City for company membership fees and half of each employee's membership fee.
- Telework!VA: As shown in **Figure 7-7**, 20 companies and 1,745 employees participated in the program between FY 2002 to FY 2011.
- Regional marketing and incentive programs, including NuRide and Pool Rewards Old Town Transit Shop
- Community Outreach Events, 205 pledges for 2010 Try Transit Week
- Ridematching and Guaranteed Ride Home (GRH)
- Electronic and paper communications materials

Figure 7-7: Impact of Local Motion's Employer Services Program on Telework!VA Participation (2002-2011)

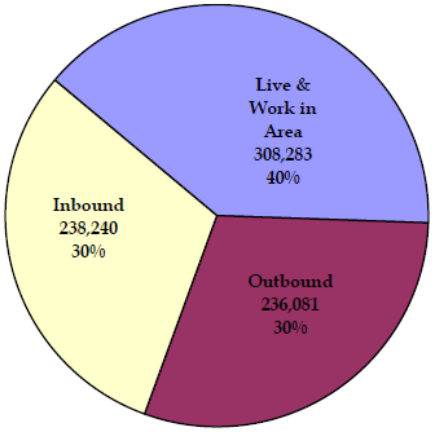


Source: Local Motion Long Range TDM Plan 2011-2036

7.3.2 Fairfax County Transportation Services Group

The Fairfax County Transportation Services Group (FCTSG) Program serves residents and employees in Fairfax County and several independent cities and towns. Fairfax County is a member of the Commuter Connections network. Historically, FCTSG's TDM services are divided into two programs: RideSources and Employer Services. The FCTSG administers both programs and also provides a variety of other transportation options and services, including marketing for the Fairfax Connector transit service.

Figure 7-8: Fairfax County Commuter Patterns



Source: 2000 U.S. Census and Virginia Employment Commission.

Since commute patterns in Fairfax County are almost equally split between workers who commute into the county (**Figure 7-8**), residents who commute outside the county, and residents who live and work in the county, FCTSG needs to provide programs that serve all types of commutes. The major FCTSG services include:

- *Carpool/Ridematching and Vanpool Matching/Leasing (RideSources):* Services include providing general commute information, assisting individuals using the Commuter Connections on-line tool for regional carpool or vanpool ridematching, and helping vanpools apply for funding through the state-supported Van Start/Van Save programs. In 2011, approximately 30,000 people were in the database.
- *Guaranteed Ride Home (GRH):* FCTSG helps individuals sign up for and use the GRH program administered by MWCOG.
- *Employer Services:* In 2009, FCTSG had relationships at some level with approximately 1,000 of over 5,000 employers in the service area.
- *Telework:* Currently, 83 companies are involved in the Telework!VA program in the FCTSG service area.
- *Bicycling/Walking:*
  1. Providing walking and bicycling information and maps
  2. Encouraging amenities such as employee lockers, showers, bike racks, trails or paths, and secure storage or a maintenance area for bicycle repair
  3. Supporting Bike to Work Day
  4. Promoting the dedicated bicycle lanes in Fairfax County
  5. Providing contact information for regional biking/walking advocacy groups
  6. Marketing bicycle racks on all Fairfax Connector buses
  7. Developing bicycle standards to address bicycle parking requirements, rack and locker specifications, bicycle sharing, etc.
- *Public Transportation marketing/outreach*
- *Community Residential Program (CRP):* by partnering with residential developments, multifamily complexes, and associations.
- *SmartBenefits Incentive:* Fairfax County currently is offering a financial incentive to employers who implement a SmartBenefits transit program for their employees by paying 50 percent of the benefit amount for each employee for the first six months.

- *Fairfax Connector Stores:* Five "Connector Stores" are located at transit stations and park-and-ride lots around the County. These stores are not operated or staffed by FCTSG personnel but they provide some similar services. Services available include fare media sales, one-on-one assistance and trip planning assistance.
- *Proffers:* are administered by the Department of Planning and Zoning and are frequently used to ensure that private land developers construct sidewalks, trails, bike paths, bus stops, and other transit and TDM-friendly elements on their sites.

7.3.3 OmniMatch

OmniMatch provides TDM services to Prince William County and the cities of Manassas and Manassas Park. Activity centers in the area include Potomac Mills Mall and Marine Corps Base Quantico. Eastern Prince William County is characterized by large, dense pockets of development and concentrated commute patterns. Ridesharing in the I-95 corridor has become part of the culture, and casual carpooling or "slugging" is the predominant rideshare option. The majority of vanpools in the service area originate in the eastern half. Western Prince William County is less dense and has dispersed commute patterns.

The OmniMatch Program has historically focused on providing ridematching services to area residents commuting to Northern VA and Washington, DC. In 2002, the program was expanded to provide a more holistic, integrated approach to TDM. OmniMatch initiated an employer outreach program, adopted a more defined customer service focus, and worked to improve the quality and timeliness of ridematch and transit information. **Table 7-2** shows the number of customers served by the program in 2008 and 2009.

Table 7-2: OmniMatch Program Statistics

Fiscal Year	New PRTC Applications Processed	Other Applications Processed	Passengers Served Per Day	Passengers Served Per Month
2008	1,148	533	–	–
2009	1,142	638	30,282	638,628

Note: "New PRTC Applications Processed" include all new customers inquiring about rideshare options in Prince William County and the Cities of Manassas and Manassas Park.
"Other Applications Processed" include reapplicants, deletions and commuters contacted as a follow-up interested in remaining in the program.
"Passenger Per Day" count is based on average passenger occupancy rate of 13 per maxi-van and 5 per mini-van.
"Passengers Per Month" is former figure multiplied by number of days per month.

Source: OmniMatch.

- *Carpool/Ridematching:* The majority of initial contacts with customers and employers are related to carpool/vanpool start-up or ridematching. Residents and employees may use the Commuter Connection online tool for instant ridematching information or use the match request form on OmniMatch's website to receive one-on-one trip planning/transportation program information and ridematching assistance. There are about 2,000 active ridematching applicants from the service area in the Commuter Connections database. Over 1,000 new applicants are added to the database annually. OmniMatch contacts all active rideshare applicants regularly for follow-up.

- *Vanpool Matching/Leasing:* This is one of the largest vanpool markets in VA. In addition to the Commuter Connections ridematching services, OmniMatch supports existing vanpools and promotes establishment of new vanpools by providing:
  - Technical assistance for leasing and starting a vanpool
  - VanStart/VanSave subsidies
  - Assistance to Prince William County residents to take advantage of the personal property tax relief program for vanpools
- *Guaranteed Ride Home (GRH):* is administered through MWCOG.
- *Employer Services:* This program is contracted out. There are currently over 200 employers in the program. Of these, 13 have an active Level 3 or 4 program. Information about telework, bicycling, walking, and public transportation is part of the employer services program.
- *Marketing:* OmniMatch is co-marketed with PRTC's transit services on PRTC's website, newspaper and magazine advertisements, and directory listings.
- *Teen Pass:* OmniMatch promotes the Teen Summer Pass which costs $25 and gives teens unlimited rides on local OmniLink and Cross County Connector buses during the summer. As an incentive, a free gift and discounted tickets to Potomac Nationals baseball games are offered to Teen Summer Pass holders.
- *Provision of park-and-ride spaces:* PRTC has supported the development of several park-and-ride lots through proffers, and OmniMatch directly leases 220 spaces for carpools/vanpools. In addition to these official spaces, OmniMatch has informal agreements with several churches and local businesses to allow carpool parking in some spaces. An additional 5,600 private and "unofficial" park-and-ride spaces are located in lots owned by VRE, shopping centers, and local businesses and churches.

7.3.4 GWRideConnect

GWRideConnect, the TDM program by GWRC, currently supports the largest vanpool fleet in the state, manages the AdVANtage vanpool self-insurance program, and is an active partner in regional transit and transportation planning. GWRideConnect is a member of the Commuter Connections network. The program also continues to provide free ridesharing services to assist persons who are seeking daily transportation from the George Washington Region to employment and other destinations in the District of Columbia, Northern Virginia, Richmond, Dahlgren, and the Fredericksburg area. Disseminating information on the range of transportation options available to residents and employees to enable informed transportation decision-making is the core of GWRideConnect's program. **Table 7-3** shows the number of customers served by the program in 2009.

Table 7-3: GWRideConnect Program Statistics for 2009

	Total	Vehicles Removed Daily	Vehicle Miles Traveled Reduced per Year
Rideshare applicants	2,572	N/A	
Carpools registered	130	260	7,800,000
Vanpools registered	400	4,800	144,000,000,
Commuter bus runs	27	810	24,300,000
Total			*176,100,000*

Source: GWRideConnect, 2035 George Washington Regional Long-Range Transportation Plan.

- *Carpool/Vanpool/ Bus Ridematching:* GWRideConnect assists in the creation of new commuter pools (cars, vans, and buses) and works to keep these pools successfully operating. GWRideConnect receives over 2,000 applications for ridematching each year. Using both the Commuter Connections' database and GWRideConnect's own custom-designed ridematching software, each applicant is provided a personalized listing of existing vanpools, carpools, and buses going to their work location, along with information on commuter incentive programs, Guaranteed Ride Home, local and commuter buses, commuter lots, VRE, the Washington Metro system, and telecommuting. A follow-up survey is conducted to determine if further assistance is needed and the commute mode being used. Currently, there are 3,587 active ridematching applicants from the service area in the GWRideConnect and Commuter Connections databases. The program produces approximately 5,000 match letters each year.
- *Vanpool Matching/Leasing:* GWRideConnect coordinates a vanpool fleet of 187 vanpool operators and nearly 400 vans, resulting in over 1,200,000 passengers being served annually. GWRC does not own or operate any vans, but assists vanpools that are leased by third-party agencies (e.g., VPSI) as well as vanpools that are run by private operators. Vanpool formation and maintenance is one of the program's primary focuses. Vanpools are supported by providing:
  - One-on-one technical assistance to lease and start their own vanpool
  - Benefits and incentives – GWRideConnect has contracted with the Washington Metropolitan Area Transportation Authority (WMATA) to accept SmartBenefits Transit Vouchers – tax free transit subsidies – from area vanpools. Assistance is provided to set up SmartBenefits accounts with WMATA and redeeming SmartBenefit Transit Vouchers.
  - Van Start/Van Save subsidies - In fiscal year 2009, GWRideConnect assisted 13 vanpools with Van Start subsidies and three vanpools with Van Save subsidies.
  - AdVANtage self-insurance developed by which provides affordable self-insurance liability protection for vanpools, in partnership with the Division of Risk Management (DRM) using DRPT seed funding. GWRideConnect currently assists DRM with the operations of the program and markets AdVANtage to vanpool operators Statewide. The AdVANtage program has been in operation for just over one year and nearly one-half of GWRideConnect's vanpool fleet now has self-insurance liability protection through the program.
- *Guaranteed Ride Home (GRH):* is administered through Commuter Connections.
- *Employer Services:* GWRideConnect contacted 33 employers in the region over the last year and is developing lists of major employers located along the region's most congested corridors (Routes 3, 17, and 610) for targeted outreach in the future. Two large employers in the region currently have active, Level 3 or 4 workplace TDM programs.
- *Telework:* GWRideConnect promotes three telework centers that are operated by GWRC. Telework information is provided to ridematch customers.
- *Marketing:* GWRideConnect is marketed through radio commercials, community and worksite events, newspaper advertisements, press releases, direct mail, websites, "take one" displays at community locations, and bulk information packets distributed through employers and realtors.

- Other programs and services include:
  - Serving on regional/project Planning Advisory Committees
  - Realtor and developer outreach to promote non-SOV options among new residents and encourage TDM supportive development
  - Congestion management planning by assisting in the development of Congestion Mitigation Plans for the I-95 HOT Lanes project and other Mega Projects impacting the area. In December 2004, the FAMPO Policy Committee adopted the Congestion Management System (CMS) program for the FAMPO region which initially examined the North Stafford County area, and will eventually analyze all of the congested corridors in the George Washington Region in detail and recommend modifications as appropriate.

7.4 Some Regional Marketing and Incentive Programs

7.4.1 Marketing and Promotions

Commuter Connections provides regional marketing for regional TDM programs. A new creative umbrella campaign was launched in the spring of 2011 to promote Guaranteed Ride Home, Rideshare, and 'Pool Rewards, as well as special events (Bike to Work Day and Employer Recognition Awards). The campaign included advertising via radio, television, gas pump toppers, direct mail, member donated advertisement space on transit, internet banner ads, social media including Facebook and Twitter, as well as a co-promotion with a local pizza company. The Commuter Connections marketing group also circulates a quarterly newsletter. Only the non-attainment area for the region is included (Arlington, Alexandria, Prince William County, Fairfax County and Loudoun County) in the Commuter Connections campaigns

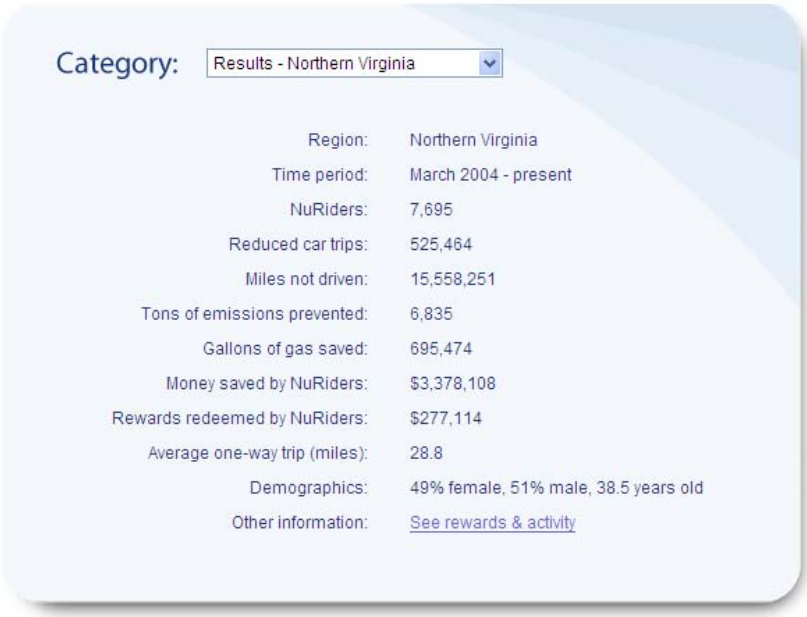
The Commuter Connections website has seen over 66,000 visits between January and May 2011. Commuter Connections has received over 3,300 applications for GRH during January-March 2011, an increase of 150 percent compared to the same period for the previous year. They have also received over 3,100 rideshare applications during January-March 2011, which is an increase of 119 percent compared to the same period for the previous year. While various factors influence the success of TDM programs, it is reasonable to attribute a large part of these successes to the Spring umbrella campaign.

Additionally, individual agencies and service providers also conduct their own marketing campaigns and promotions, including WMATA, PRTC, FCTSG, GWRideConnect, VDOT, and VRE.

7.4.2 Incentive Programs

- The Pool Rewards program encourages commuters to carpool by offering monetary incentives. Participants can earn $2 ($1 each way) for each day they carpool to work over a consecutive 90-day period, up to a maximum of $130. Each new carpool must commute to work an average of two or more weekdays for the duration of the 90-day program. This service is part of the Commuter Connections program and is administered by the MWCOG.
- The free NuRide program offers incentives and rewards to commuters who walk, bike, telecommute, carpool, vanpool, take a subway, train, bus, or work a compressed week. Active NuRide members typically redeem around $300 a year in rewards. This is an independent service and is offered nationally. Results posted by the service on their website for the Northern VA region are shown below.

Figure 7-9: NuRide Trip Reduction Results



7.5 TDM Plans for BRAC Sites

Actions taken through the 2005 Base Realignment and Closure (BRAC) Act will add approximately 22,000 personnel that will be commuting along I-395/95 and US Route 1 to the following military installations:

- Fort Belvoir/Belvoir North (National Geospacial Agency)
- Marine Corps Base (MCB) Quantico
- Mark Center
- Henderson Hall

BRAC adjustments at Fort Belvoir's Main Post are anticipated to add 3,400 personnel. Ft. Belvoir North is anticipated to have 8,500 personnel. The Mark Center in Alexandria is anticipated to have 6,400 personnel.

Each site impacted by BRAC was required to produce a Transportation Management Plan (TMP) to manage the transportation impacts of personnel relocations.

Objectives of the BRAC 133 TMP (Mark Center) are:

- Achieve a minimum 40% reduction in single occupant vehicle trips
- Encourage alternative commuter modes to facilitate mobility (ridesharing, public transit use, walk and bike)
- Establish a Transportation Management Program Office

Measures recommended in this TMP include:

- Employee orientation and pre-relocation outreach
- Ride-matching, biking and walking assistance
- Coordination with the Pentagon transit center and public transit agencies
- DoD NCR Transportation Benefit Program
- Shuttle service to the Pentagon Metrorail station
- Coordination of telecommuting/flex time/compressed work week programs
- Parking permitting
- Priority parking for carpool/vanpool/low-emission vehicles
- Reserved flex-time employee parking
- Parking overflow management
- Special events protocol

The TMP for Fort Belvoir/Fort Belvoir North include a telework program, promotion of alternative work schedules, a rideshare website, an internal shuttle and parking management policies that promote ridesharing. The internal shuttle is to connect to external transit routes at army post gates. An external shuttle is also proposed to provide connections between the Franconia-Springfield Metrorail station and Fort Belvoir North. Shuttle operations will be administered directly by the Department of Defense (DoD).

To ensure regional coordination of the TMPs, the Northern Virginia BRAC Coordinators group has:

1. Established the BRAC Rideshare Roundtable for education of and outreach to relocating agencies. Major issues identified through the Roundtable include:
   - Lack of coordination between individual plans and with the region.
   - Lack of adequate transit service to sites.
   - Lack of access to public transportation service on military installations due to security concerns (although REX goes on Fort Belvoir).
   - Lack of funding for DoD shuttles for Fort Belvoir or MCB Quantico (DoD shuttles will be used at Mark Center and Belvoir North).
   - Lack of coordination with VDOT and DRPT for more coordinated solutions, i.e. instead of one DoD shuttle system there are several all vying for space in the bus bays at the metro stops.
2. Produced a rideshare resource guide to define a transportation network for each BRAC facility
3. Sought funding for alternative modes:
   - Prepared an application to the U.S. DOT to implement a Dynamic Rideshare pilot study to provide driver and rider incentives, use smart phones to arrange rides with the help of Avego Corporation's services and software, and quickly get Department of Defense (DoD) personnel who are moving to new locations matched-up with potential drivers.
   - Prepared an application to MARAD for funding a market study for a commuter ferry on the Potomac that would make east/west and south/north crossings. About 2,000 people commute from Maryland to Fort Belvoir and about 600 from Maryland to Quantico. The service would benefit many more working at other locations.

In addition to these short term plans that specifically address BRAC-related impacts, the master plans for Fort Belvoir and Marine Corps Base Quantico include short and long range transportation plans for the installations.

7.6 TDM Program Needs

The three critical goals that TDM strategies strive to achieve are:

1. Change travel behavior to maximize the efficiency and use of existing transportation system.
2. Increase the use of high occupancy commute modes (bus, rail, carpool and vanpool) and remove auto trips through telework, bike and walk option.
3. Increasing mobility and accessibility during all parts of the workday including AM/PM commute, lunchtime, after work, and work travel

TDM program recommendations that were presented in the 2008 Transit/TDM Study for the I-95 corridor are still valid for continued consideration. Recommendations that were include in that study's "Tier 1 (or lower investment scenario) were as follows:

- Carpool Incentives: Rewards and incentives for carpoolers.
- Electronic Toll Transponders for Vanpools: Provide free electronic toll transponders to vanpools.
- Rideshare Program Operational Support: Additional staff for commuter assistance programs in the corridor and feeder markets to promote TDM programs and transit.
- TDM Programs Marketing: Expand marketing efforts touting TDM programs and non-SOV commute modes in the corridor and feeder markets. New signage in park-and-ride lots and along corridor to promote TDM programs.
- Vanpool Driver Incentives: Provide incentives to get new drivers and retain existing drivers for vanpools.
- Vanpool Insurance: Increase vanpool insurance premium pool buy-down for vanpools.
- Vanpool Tracking: Develop a tracking mechanism (GPS, cell phone) to track vans used for vanpools.
- VanStart/VanSave: Additional financial support to cover the cost of vacant seats for new vanpools during start-up operations, and established vanpools that have temporary vacancies. Support is short-term, one to six months, until regular riders are found to fill vacant seats.

The prior study's recommendations in the medium tier of financial investment were:

- Capital Cost of Contracting for Vanpools: Incentives, IT monitoring and reporting of vanpool mileage, and promotion of capital cost of contracting for vanpools.
- Telework Program Assistance: Financial incentives for employers that start new telework programs at their worksites, funding for home-based equipment costs and consulting support.
- Capital Assistance for Vanpools: Provide financial assistance for the purchase or lease of vans for vanpools.
- Enhanced Guaranteed Ride Home: Enhanced promotion and operation of Guaranteed Ride Home (GRH) services in the extended corridor. Offers free taxi or rental car transportation to registered commuters who use alternative modes and have a personal emergency during the workday.

8.0 Generalized I-95 Corridor Transit, Parking and TDM Needs

This Technical Memorandum has documented the key land use, travel pattern, transit, parking and TDM program usage characteristics identified in the sections below.

8.1 Land Use Patterns

An analysis of demographic characteristics, as reflected in the MWCOG and FAMPO travel demand models indicate continued population and employment growth, resulting in increased densities in the I-95 corridor. Population in the northern portion of the corridor is anticipated to grow by 22 percent between 2011 and 2035. Population in the southern portion of the corridor is anticipated to grow by 52 percent for this same time period. Employment is also anticipated to grow at similar rates, with higher employment densities immediately adjacent to I-95. The MWCOG data reflects higher densities in zones where the BRAC projects are occurring.

8.2 Travel Patterns

Existing worker travel flow data from the Census' American Community Survey shows 57,000 workers from the I-95 corridor portions of Prince William and Fairfax Counties, going to work destinations in Alexandria, Arlington and Washington, D.C. Another 16,500 worker trips are from the I-95 corridor portions of Stafford County, Spotsylvania County and Fredericksburg, going to work in these destinations.

MWCOG's travel demand model was used to understand the potential future growth in home-based work (HBW) trips from I-95 corridor zones. Fairfax County HBW trips in the I-95 corridor are projected to grow 17 percent by 2035. Prince William County HBW trips in the corridor are projected to grow by 35 percent. Growth rates are harder to determine for the southern portion of the corridor, for the MWCOG model is less refined in this part of the corridor. However, it is expected the HBW travel growth rate from the southern portion would be similar to the population growth rate, which is over 50 percent by 2035.

HBW trip attractions at major destination areas were determined with the MWCOG travel demand model. The MWCOG model indicates the central area of Washington, D.C. will continue to be the most common destination for HBW trips. Most of the growth in central Washington, D.C. HBW trips is expected to occur in the Navy Yard area, south of the Mall. Higher HBW growth rates are expected in Arlington, Alexandria, and Tysons Corners, but with total trip attractions at these locations still being less than half of those for the central area of Washington, D.C.

8.3 Existing Transit Service Utilization

Both the Fairfax Connector and WMATA provide express bus service from the Fairfax County portion of the I-95 corridor to the Pentagon (via FC 380-D and select patterns of Metrobus Route 18). These routes are generally less than half full. Routes that connect to the Franconia-Springfield Metrorail Station tend to be well-utilized.

PRTC OmniRide routes are well utilized, with over 5,800 average daily passenger trips. The PRTC MetroDirect route that operates in this corridor carries over 800 average daily passenger trips. PRTC routes typically start at park-and-ride lot locations away from the I-95 corridor and circulate through neighborhoods before stopping at a park-and-ride lot immediately adjacent to I-95. Buses are typically less than ½ full when arriving at an I-95 park-and-ride lot. These buses, however, tend to leave full from the I-95 park-and-ride lot. Thus, passengers are drawn more to the lots closest to I-95.

PRTC's ability to attract more ridership on OmniRide routes is limited by two factors – park-and-ride lot capacities and limitations at the existing bus maintenance facility. Many of the lots served by OmniRide routes are at or near capacity. PRTC also does not have the ability to expand bus storage or maintenance at its existing bus maintenance facility.

Martz and Quick's routes carry 800 to 900 passenger trips in each peak period (i.e., 1,600 to 1,800 daily one-way passenger trips. This reflects an average of 30 to 40 passengers per bus trip. It is important to note that Martz and Quick's round trip fares are $24 to $28 for a one-day ticket. PRTC's fares for a round trip are $10.50 with a SmarTrip card, and $14 cash. Thus, there are likely residents from the southern portion of the corridor that drive to Prince William County lots to use OmniRide service, for that service is less expensive and more frequent.

VRE also is well-utilized, with over 10,600 trips a day. Many VRE train trips are operating with standing passenger loads. VRE's potential to expand ridership is primarily limited by its available passenger car fleet, midday storage availability, and parking availability at rail station parking lots.

8.4 Park-and-Ride Lot Utilization

As noted in the paragraphs above, bus service and VRE service expansion cannot happen without a concurrent expansion of park-and-ride lots. Many of the major parking lots in the corridor are at capacity, or close to capacity. In particular, lots that are served by transit with several capacity constraints are:

Springfield Plaza	PRTC Transit Center
Horner Road	Garrisonville Rd. Staffordborough Blvd.
US 1/VA 234	Garrisonville Rd. Mine Road
Lake Ridge	Stafford (VA 630)
Old Bridge Rd./123	Route 3 Gordon Road
Potomac Mills	Route 3 Salem Church Road
Tacketts Mill	

VDOT has plans to expand parking in the corridor. Many of VDOT's expansion plans address expansion needs that were identified in the prior I-95/I-395 Transit and TDM Plan. VDOT is proceeding with plans to add two lots in the north portion of the corridor that will provide 1,300 spaces. VDOT is also proceeding with plans to add up to 2,000 spaces at south corridor park-and-ride lots, with an additional 1,000 spaces at the proposed Spotsylvania VRE station.

8.5 TDM Programs

Several TDM programs are in place in the I-95 corridor that have reduced single occupant vehicle usage in the corridor.

Telework continues to grow in popularity in the Washington, D.C. area. There are a few privately operated telework centers in operation in the corridor.

Dynamic ridesharing (slugging) also continues to grow in this corridor. A 2009 survey by VDOT estimates that there are 6,450 "sluggers" that originate from 15 locations in the corridor. About 25 percent of sluggers originate from the Horner Road Lot. About one third of all sluggers are destined to the Pentagon.

Commuter Connections serves as an umbrella agency for local TDM programs. TDM agencies within the corridor include Alexandria's Local Motion, the Fairfax County Transportation Services Group, OmniMatch, and GWRideConnect. These TDM agencies provide employer services that are aimed at reducing single occupant vehicle travel. Both OmniMatch and GWRideConnect administer large vanpool programs, with GWRideConnect overseeing over 400 vanpools.

Finally, it is important to note that the corridor's BRAC projects include funding for a Transportation Management Program Office that will be responsible for promoting alternatives to single occupant vehicle travel.

8.6 Summary of I-95 Corridor Transit and TDM Needs

Building upon the previous *I-95/I-395 Transit/TDM Study* and subsequent planning efforts by various agencies in the corridor, the following generalized needs have been identified:

Fairfax County Area

1. New commuter and local bus service from the proposed VDOT Saratoga park-and-ride lot.
2. Potential commuter bus service from the "Circuit City" lot in Springfield. Fairfax County is presently considering expansion of this lot. Commuter service at this lot will require pedestrian access improvements for returning buses in the afternoon (e.g., a pedestrian bridge over Keene Mill Road).
3. Modification and expansion of local route bus service connections to the Franconia-Springfield Metrorail Station, as proposed in the Fairfax Connector TDP.
4. Cross-County express / limited stop transit service between the I-95 corridor and Tysons Corner.
5. Shuttle transit service to the Fort Belvoir and Fort Belvoir North BRAC projects from the Lorton VRE Station and Franconia-Springfield Metrorail Station (note – the DoD is planning on providing shuttle service from Franconia-Springfield to Fort Belvoir North in conjunction with opening of the NGA this fall).

Prince William County

1. Immediate expansion of service to address current bus overloads (PRTC is in the process of adding trips to address these overloads).
2. Adjustments to existing OmniRide routes to provide commuter bus service to the proposed VDOT Telegraph Road park-and-ride lot.

3. Advancement of PRTC's planned western maintenance facility (to free-up capacity at PRTC's existing maintenance facility).
4. Accommodation of ridership growth on existing OmniRide routes, including the addition of service in the midday and later evening as services mature.
5. Expansion of OmniRide service to new markets including Alexandria (the Mark Center) and Merrifield, extension of OmniLink service to Fort Belvoir, extension of the Prince William Metro Direct route to circulate around Springfield, and resumption of OmniRide service to the north along Route 1.
6. Continued expansion of park-and-ride spaces in Prince William County, in particular in close proximity to I-95.

Stafford and Spotsylvania Counties

1. Coordination between VDOT and FAMPO on park-and-ride expansion needs and locations in the corridor.
2. Accelerated advancement of park-and-ride spaces in the Garrisonville Road and Route 3 areas, (i.e., completion of VDOT's current plans to expand park-and-ride lots at these two locations).
3. Expansion of transit service levels, with more direct trips (i.e., bus trips that stop at only one park-and-ride lot).

VRE

1. Advancement of the Spotsylvania County rail station.
2. Expansion of parking at other rail stations.
3. Increased train passenger capacity through longer trains.
4. Addition of midday and overnight storage to accommodate the increased passenger fleet required with longer trains.

TDM Programs

1. Promotion of TDM programs through a targeted marketing campaign for I-95 commuters.
2. Enhancement of employer services programs at destinations of I-95 commuters.
3. Establishment of a coordinated monitoring program that measures effectiveness of TDM programs.
4. Continued expansion of vanpool programs.
5. Establishment of bike sharing and/or car sharing programs in strategic locations.
6. Enhancement of access to information on travel options in the I-95 corridor through websites/online services, maps/printed information, advertising, and retail outlets.
7. Implementation of trip planning technology that enhances use of transit, dynamic ridesharing and ride-matching.

Destination End Needs

1. Management of bus pick-up and drop-off locations within downtown Washington, D.C. and Arlington County.
2. Management and eventual expansion of bus facility capacity in Pentagon/Pentagon City/Crystal City area.
3. Expansion of Franconia-Springfield Metrorail Station bus bays (as planned), and potential need for expansion of parking.
4. Management of bus activity at Mark Center Transit Center.

I-95 Corridor Transit and TDM Plan

Technical Memorandum #2: I-95 Corridor Transit and TDM Needs

FINAL

Prepared for:

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Virginia Department of Rail and Public Transportation

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CTG Connetics Transportation Group

November 22, 2011

Table of Contents

1.0 Introduction

Virginia is addressing critical transportation needs for the I-95 Corridor. Through a concurrent package of improvements, the Commonwealth will deliver congestion relief, enhance transit and provide new choices on I-95. These concurrent efforts related to the overall strategy to enhance travel and safety are listed below.

1. I-95 HOT/HOV Lanes
2. VDOT Seminary HOV/Transit ramp
3. Transit Improvements

The *I-95 Corridor Transit and TDM Plan* is being developed to provide the Commonwealth of Virginia with recommendations for transit and Transportation Demand Management (TDM), including both operations and capital investments, to complement the I-95 HOT/HOV lanes improvements. It pivots off of the 2008 DRPT *I-95/I-395 Transit/TDM Study*. This plan is being developed with the intent of maximizing utilization of the HOT/HOV lanes network and responding to the demand for increased public transportation and ridesharing.

The *I-95 Transit and TDM Plan* is being developed in collaboration with the Secretary of Transportation and the Virginia PPTA (Public-Private Transportation Act) Office. A multi-jurisdictional Stakeholder Group was formed early in the study process to provide technical input into the study, with meetings at three key points during the course of the study.

This second Technical Memorandum presents a refined assessment of transit and TDM service and facility needs for the I-95 corridor. Specifically, it addresses transit and TDM service and facility improvements that would maximize the capacity of the I-95 HOT/HOV lanes, as well as other needs in the larger I-95 corridor.

The prior study effort involved extensive stakeholder outreach efforts and technical analyses that included travel demand modeling. This current study effort is much shorter in duration, and does not include ridership forecasting efforts with the travel demand model. Therefore, this current work effort has concentrated on refining service and facility need recommendations from the prior study through completion of the following steps:

- Identify existing service and facility deficiencies.
- Review and document recommendations from the prior *I-95/I-395 Transit & TDM Study*. The prior study identified service and facility needs through 2030, of which a portion of those recommendations were included in the study's Fiscally Constrained Plan.
- Review and document recent plans and projects that have occurred since completion of the prior study.
- Review and document anticipated demographic growth within the corridor through 2035.
- Discuss and gather input on needs plan recommendations with affected corridor stakeholders.
- Based on the assessment of current deficiencies, recent plans and projects, anticipated demographic growth, and corridor stakeholder input, either validate prior study's identified needs, or revise the list of service and facility needs.

The above approach has been applied to the following subject areas:

- Non-rail park-and-ride lots
- Bus transit services
- VRE services and facilities
- TDM programs
- Destination end facilities

Needs within each subject area have been identified primarily to maximize the capacity of the I-95 HOT/HOV lanes south of I-495. Other relevant, but not directly related, needs within the larger I-95 corridor area have also been identified.

2.0 Non-Rail Park-and-Ride Lot Needs

The prior *I-95/I-395 Transit and TDM Study* identified an overall need for an additional 2,935 non-rail park-and-ride spaces in the Fairfax and Prince William Counties portion of the corridor. Of this total, 1,900 spaces were included in the study's Fiscally Constrained Plan. This study also identified the need for an additional 3,375 spaces in the Stafford and Spotsylvania Counties portion of the corridor. Of this total, 2,600 spaces were included in the Fiscally Constrained Plan. In total, the prior study identified a corridor need for **6,310 non-rail park-and-ride spaces**, of which **4,500 spaces** were included in the study's Fiscally Constrained Plan.

To determine if the prior study's stated needs were still valid, the I-95 corridor was divided into the following seven (7) districts south of I-495:

- Fairfax County District
- Prince William District #1 (Lake Ridge Area)
- Prince William District #2 (Dale City/Potomac Mills area)
- Prince William District #3 (Dumfries/Montclair area)
- North Stafford County
- South Stafford County
- Spotsylvania County/Fredericksburg

Existing park-and-ride utilization was determined for each defined district to identify existing park-and-ride lot deficiencies. Prior *I-95/I-395 Transit and TDM Study* recommendations were reviewed, and known park-and-ride expansion plans were documented. Demographic forecasts for each district were then determined, and an assessment was then made on whether the prior study's stated needs were still valid, or if there was a basis to modify those recommendations.

A district-level analysis localizes the park-and-ride assessment, which in turn, helps minimize auto traveling distances to/from park-and-ride lots for it increases the likelihood of capturing trips as close as possible to the trip origin. Other local government initiated measures, such as land use policies and the promotion of alternative transportation modes (e.g., local bus routes, bike paths) could also reduce auto traffic volumes to/from proposed park-and-ride lots.

All of the park-and-ride improvements discussed in this section would maximize the capacity of the I-95 HOT/HOV lanes.

2.1 Fairfax County District Needs Assessment

Existing Park-and-Ride Lot Utilization

The "Fairfax County District" portion of the I-95 corridor and locations of non-rail park-and-ride lots in this district is illustrated in **Figure 2-1**. Estimated lot capacities and lot occupancy rates are presented in **Table 2-1** (source: VDOT 2010 park-and-ride inventory and Fairfax County TDP). The overall park-and-ride lot supply for this district is estimated at 2,806 spaces, and the occupancy rate for this district is 66 percent. However, it is important to look closer at the occupancy rates of individual lots. The Fairfax Connector provides service to two park-and-ride lots (the Sydenstricker and Backlick North park-and-ride lots are served by Route 380-D). Recent lot counts indicate the Sydenstricker lot is operating above

capacity. The American Legion Post and Springfield Methodist Church lots are also operating at capacity. However, recent observations indicate that perhaps demand at these lots have eased somewhat with the addition of the Circuit City lot. The Rolling Valley park-and-ride lot is served by Metrobus 18, and is 70 percent utilized. It is important to note, that lots in this district are used by a variety of users. In addition to use by commuter routes (18 and 395 – formally labeled 380-D), lots are used by park-and-riders going to/from Franconia-Springfield Metrorail Station via local bus routes, carpoolers and sluggers (slugging occurs at the Rolling Valley park-and-ride lot and at the Circuit City park-and-ride lot).

Figure 2-1
Fairfax County District Park-and-Ride Lot Locations

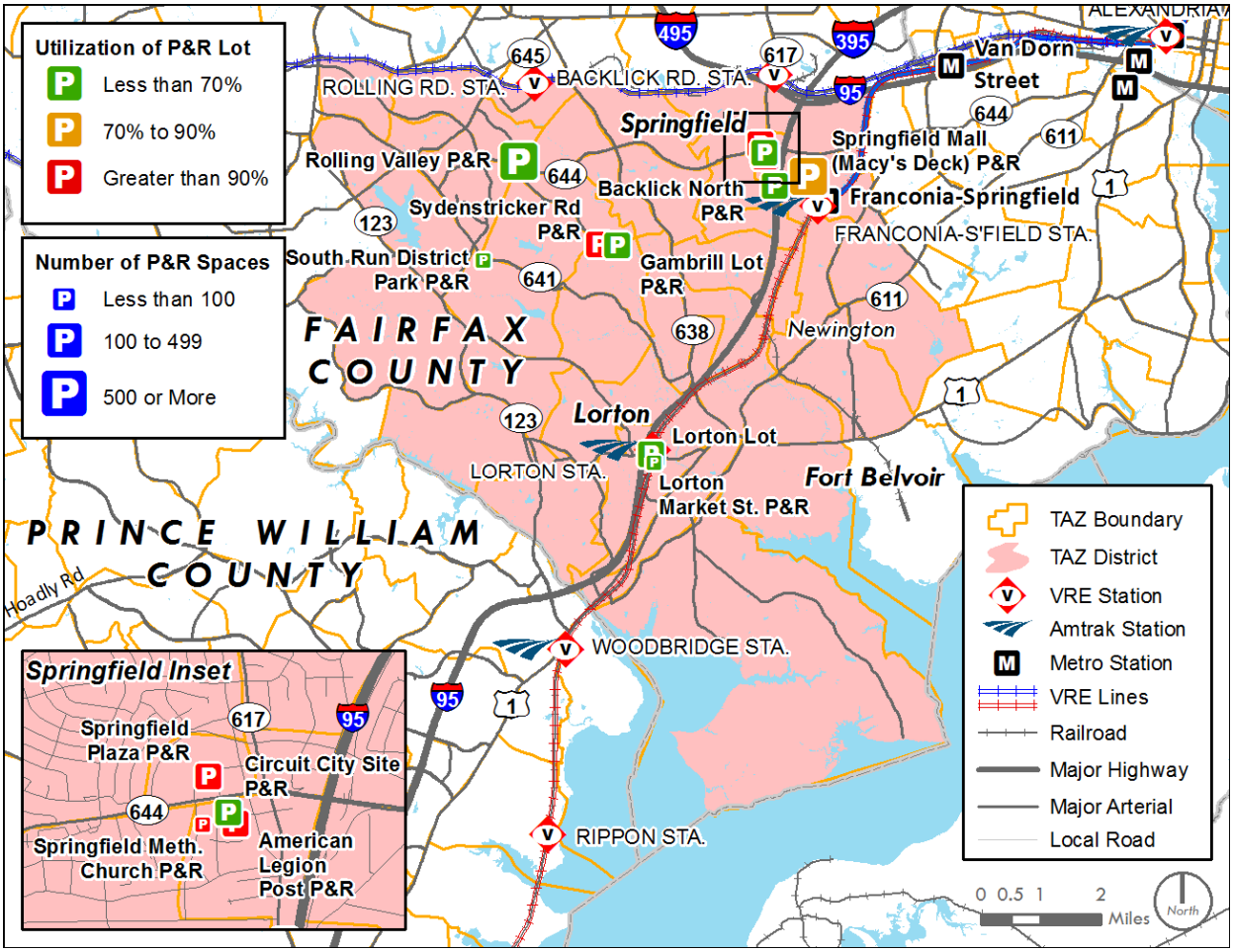

Table 2-1
Fairfax County District Park-and-Ride lot Inventory

Lot Name	Lot Location	Lot Capacity	Lot Occ.	Pct. Occ.
Rolling Valley	Old Keene Mill Road and Shiplett Boulevard	664	463	70%
Springfield Mall - Macy's Deck	Spring Mall Dr. Macy's garage	500	410	82%
Backlick North	6831 Backlick Road, Springfield	279	109	39%
Circuit City Site	7039 Old Keene Mill Road, Springfield	270	130	48%
Springfield Plaza	**Bland St. btwn Old Keene Mill Rd and Amherst Ave**	**254**	**254**	**100%**
Gambrill Lot	Gambrill Road at Hooes Road	225	137	61%
Sydenstricker Road	**Sydenstricker Road at Hooes Road**	**170**	**174**	**102%**
Lorton Lot	Gunston Cove Road at Lorton Road	170	25	15%
American Legion Post	**Amherst Ave. at Springfield Blvd.**	**100**	**100**	**100%**
Lorton Market Street	9405 Lorton Market St., Lorton	65	3	5%
Springfield Methodist Church	**7047 Old Keene Mill Road**	**57**	**57**	**100%**
South Run District Park	Reservation Dr. off of Fairfax County Parkway	52	0	0%
TOTAL		**2,806**	**1,862**	**66%**

Note: Lots shown in red are near or at capacity.

Prior Study Recommendations

The prior *I-95/I-395 Transit & TDM Study* identified the following parking needs for the Fairfax County portion of the corridor:

- Springfield/Lorton area – 450 additional spaces

All 450 spaces were included in the study's Fiscally Constrained Plan. In addition to these spaces, the prior study noted a need for an additional 1,925 spaces at the Franconia-Springfield Metrorail Station, which was not addressed as part of the prior study effort.

Planned/Programmed Lot Expansion

VDOT is proceeding with plans to construct a 600-space park-and-ride lot in the Saratoga area. This lot will be located at the Fairfax County Parkway/Rolling Road/Barta Road interchange (southeast corner of the new interchange). The lot will include direct access onto the eastbound Fairfax County Parkway entrance ramp. This lot is to be open by 2013. This lot is not located immediately adjacent to I-95, nor does it have direct access to/from the I-95 HOV lanes. Fairfax County DOT staff has expressed concern about the challenges of serving this lot with a transit route.

Demographic Projections

Anticipated population and employment characteristics for this district are noted in **Table 2-2** and reflect an employment growth rate that is higher than the district's population growth rate.

Table 2-2
Fairfax County District Demographic Characteristics

Demographic	2011	2015	2020	2035	'2035-2011 growth
Population	182,767	188,196	192,980	207,333	13.4%
Employment	75,676	86,324	89,140	97,589	29.0%
Pop/Empl. Ratio	2.42	2.18	2.16	2.12	n/a

Source: socioeconomic data used in the MWCOG 2010 Constrained Long-Range Transportation Plan

Fairfax District Needs

The addition of the 600-space park-and-ride lot at Saratoga addresses overall park-and-ride lot needs for this district. However, as noted above, lots in the Old Keene Mill Road corridor are well-utilized. The Saratoga lot provides park-and-ride opportunities for residents in the Saratoga area, but is not conveniently located for commuters in the Old Keene Mill Road corridor. Additional spaces are needed in this corridor. To keep up with anticipated population growth, an additional 250 spaces are recommended, in addition to the 600 spaces at the proposed VDOT Saratoga lot. There is an opportunity to expand the "Old Circuit City" lot that the County is pursuing, which can help address this need. It is estimated 180 spaces could be added through the purchase of two adjacent parcels and the addition of surface spaces. More spaces can be obtained by constructing a parking structure on this site (an option presently under consideration by Fairfax County). The need for these additional spaces could become more pronounced should the Springfield Mall redevelopment plans commence, and leased spaces at the Macy's parking garage are lost. There may also be a greater need for these additional spaces should the HOT lane project result in increased parking demands at Franconia-Springfield Station.

2.2 Prince William District #1

Existing Park-and-Ride Lot Utilization

The "Prince William District #1" portion of the I-95 corridor and its existing park-and-ride lots are illustrated in **Figure 2-2**. Estimated lot capacities and lot occupancy rates are presented in **Table 2-3** (source: VDOT & PRTC park-and-ride inventory). There are an estimated 2,224 spaces in this district and the overall occupancy rate is 79 percent. There are four lots presently operating at or over capacity: Lake Ridge, Hechinger's, Tackett's Mill and Old Bridge Festival Shopping Center. PRTC OmniRide serves all of these lots. Slugging also occurs at the Old Bridge Road/Route 123 and the Lake Ridge park-and-ride lots.

Figure 2-2
Prince William District #1 Park-and-Ride Lot Locations

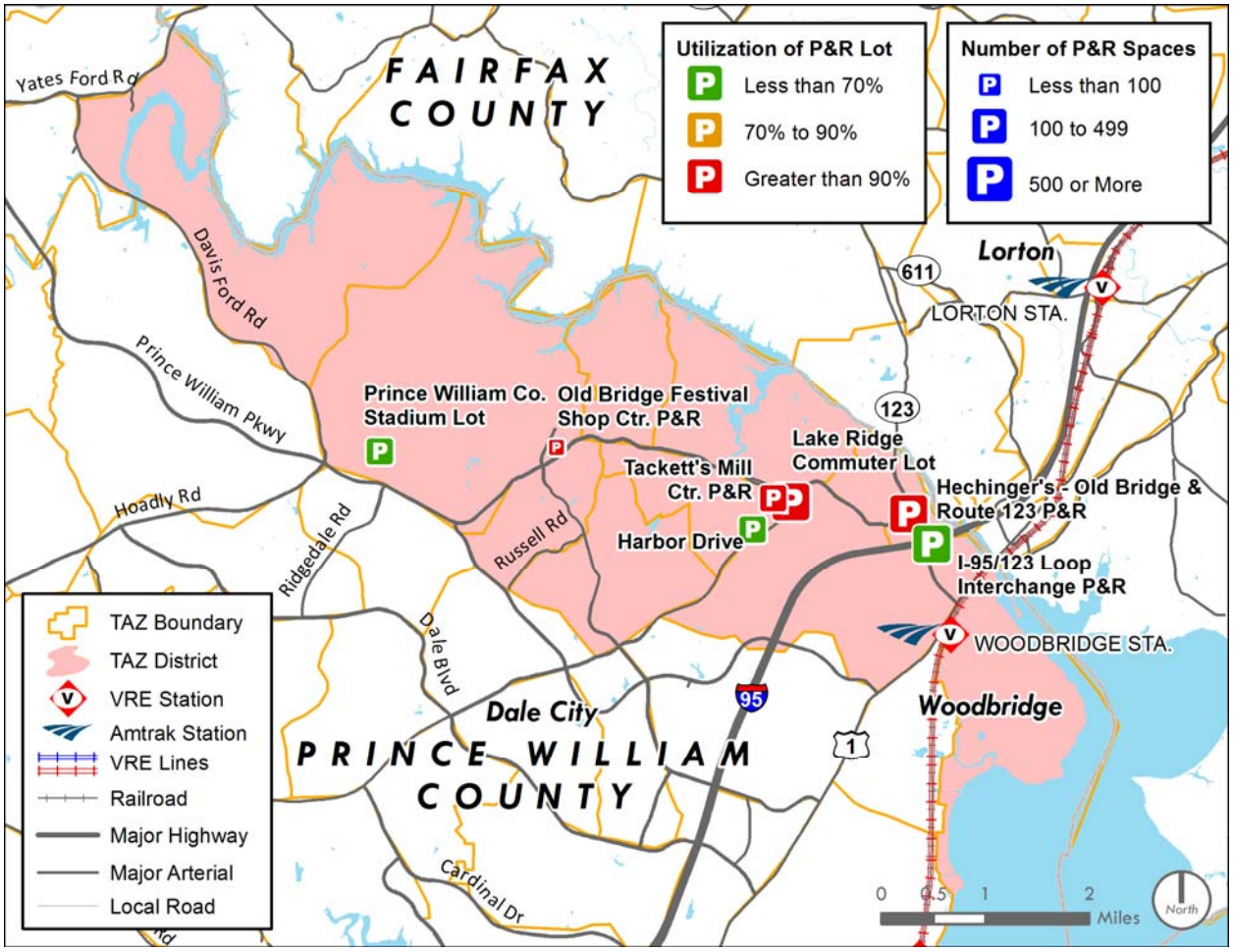

Table 2-3
Prince William District #1 Park-and-Ride Lot Inventory

Lot Name	Lot Location	Lot Capacity	Lot Occ.	Pct. Occ.
Lake Ridge Commuter Lot	**Minnieville Road & Old Bridge Road**	**638**	**632**	**99%**
Hechinger's - Old Bridge & Rte 123	**Intersection Rte 123 and Old Bridge Road**	**580**	**598**	**103%**
I-95/123 Loop Interchange	Intersection I-95 and Rte 123, Exit 160	580	292	50%
Harbor Drive	Harbor Drive and Minnieville Road	200	0	0%
Tackett's Mill Specialty Center	**Minnieville Rd & Old Bridge Rd in shopping center**	**170**	**169**	**99%**
Old Bridge Festival Shopping Center	**Old Bridge Road and Smoketown Road**	**56**	**56**	**100%**
TOTAL		**2,224**	**1,747**	**79%**

Note: Lots shown in red are near or at capacity. Prince William County Stadium spaces included in District #2 because of proximity to Prince William County Parkway.

Prior Study Recommendations

The prior study did not include any specific plans for park-and-ride lot expansion within this district, as it is defined for this study.

Planned/Programmed Lot Expansion

There are no current plans for lot expansion within this district.

Demographic Projections

Anticipated population and employment characteristics for this district are noted in **Table 2-3** and reflect an employment growth rate that is similar to the district's population growth rate.

Table 2-3
Prince William District #1 Demographic Characteristics

Demographic	2011	2015	2020	2035	'2035-2011 growth
Population	69,886	73,792	79,900	98,224	40.6%
Employment	14,573	15,524	16,757	20,455	40.4%
Pop/Empl. Ratio	4.80	4.75	4.77	4.80	n/a

Source: socioeconomic data used in the MWCOG 2010 Constrained Long-Range Transportation Plan

Prince William District #1 Needs

As noted above, three lots in this district are currently experiencing demand that exceeds available capacity. At least 150 spaces are needed to bring the utilization rates at these lots down to 90 percent. An additional 950 spaces are needed to keep pace with the anticipated 40.6 percent population growth between 2011 and 2035, resulting in a need for 1,100 spaces, as shown below.

Existing deficiency needs – 150 spaces
Population growth needs – 950 spaces
Total additional spaces – 1,100 spaces

2.3 Prince William District #2

Existing Park-and-Ride Lot Utilization

The "Prince William County District #2" portion of the I-95 corridor and locations of park-and-ride lots within this district are illustrated in **Figure 2-3**. Estimated lot capacities and lot occupancy rates are presented in **Table 2-5** (source: VDOT & PRTC park-and-ride inventory). There are an estimated 4,506 spaces in this district and the overall occupancy rate is 85 percent. Lots operating at or over capacity include: Horner Road, Potomac Mills Mall and the PRTC Transit Center (there is an adjacent gravel lot that is accommodating overflow at this location). The Dale City lot is also experiencing higher utilization (especially after the reduction in spaces at Potomac Mills Mall). Significant slugging activity occurs at Horner Road, and also at Potomac Mills Mall.

Figure 2-3
Prince William District #2 Park-and-Ride Lot Locations

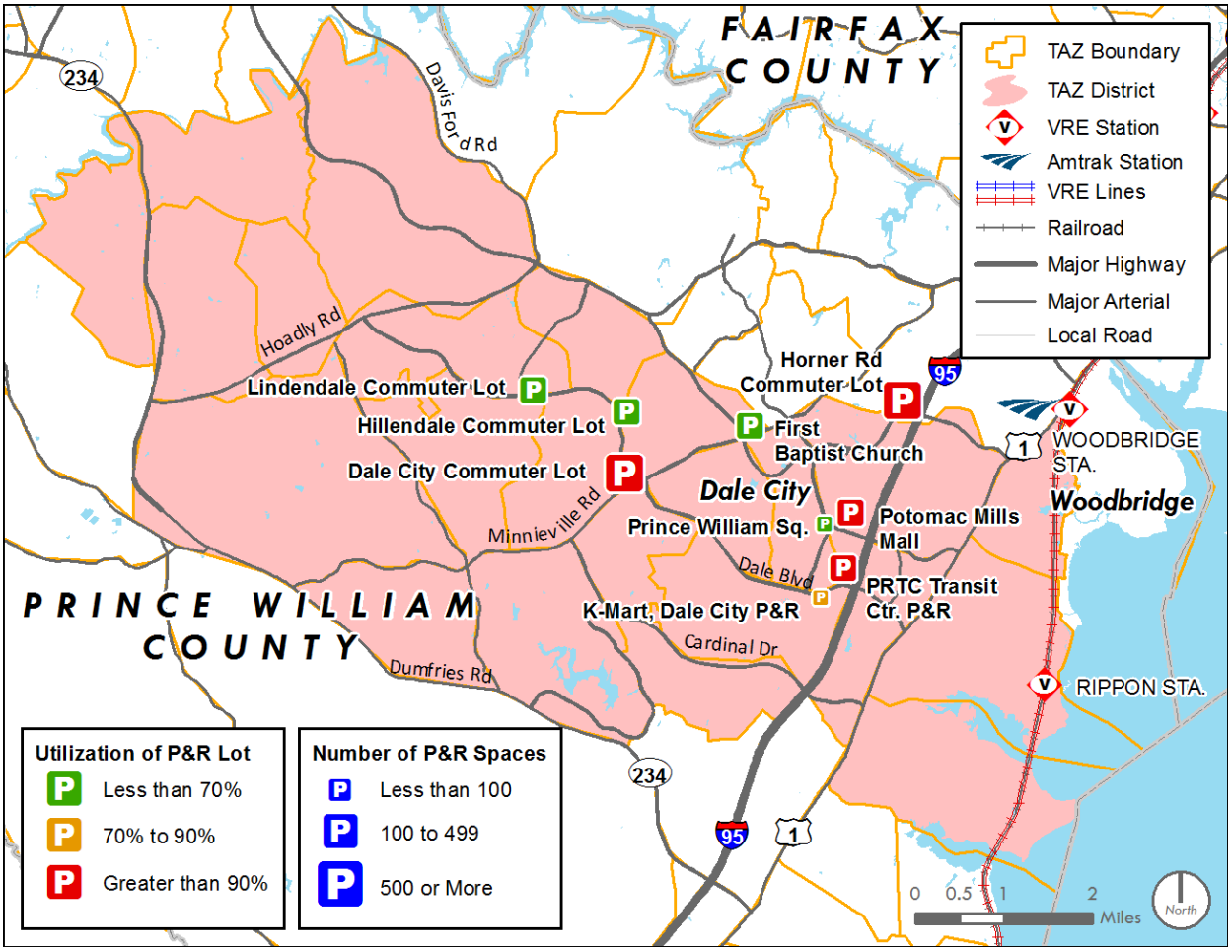

Table 2-5
Prince William District #2 Park-and-Ride Lot Inventory

Lot Name	Lot Location	Lot Capacity	Lot Occ.	Pct. Occ.
Horner Road Commuter Lot	**Prince William Parkway at I-95**	**2,363**	**2,488**	**105%**
Dale City Commuter Lot	**Minnieville Road and Dale Boulevard**	**580**	**544**	**94%**
First Baptist Church	13600 Minnieville Road	375	20	5%
Potomac Mills Mall	**Potomac Mills Mall across from Pier I imports**	**275**	**275**	**100%**
Hillendale Commuter Lot	Hillendale Road and Dale Boulevard	248	73	29%
Lindendale Commuter Lot	Lindendale Road and Dale Boulevard	216	100	46%
PRTC Transit Center	**Potomac Mills Road at Telegraph Road**	**124**	**198**	**160%**
K-Mart, Dale City	Intersection Dale Blvd & Gideon Dr.	90	75	83%
Prince William Square	Smoketown Road and Gideon Drive	45	0	0%
Prince William County Stadium	Off Davis Ford Road at Stadium	190	58	31%
TOTAL		**4,506**	**3,831**	**85%**

Note: Lots shown in red are near or at capacity. Prince William County Stadium spaces included in District #2 because of proximity to Prince William County Parkway.

Prior Study Recommendations

The prior study identified a need for a total of 2,000 additional spaces in this area, of which 1,450 were included in the Fiscally Constrained Plan. The prior study's Fiscally Constrained Plan recommended a 1,200-space expansion of the Horner Road lot, and a 250-space expansion in the Potomac Mills area.

Planned/Programmed Lot Expansion

VDOT is proceeding with construction of a 700-space lot at Telegraph Road (across from the Horner Road lot and north of Prince William Parkway). This lot is to be constructed by 2012 at an estimated cost of $8 million. These spaces will replace the 725 spaces lost at Potomac Mills Mall. The existing lease of spaces at First Baptist Church will end upon opening of the Telegraph Road lot.

Demographic Projections

Anticipated population and employment characteristics for this district are noted in **Table 2-6** and reflect an employment growth rate that is much higher than the district's population growth rate.

Table 2-6
Prince William County District #2 Demographic Characteristics

Demographic	2011	2015	2020	2035	'2035-2011 growth
Population	141,533	149,511	154,321	168,751	19.2%
Employment	32,596	34,933	38,030	47,320	45.2%
Pop/Empl. Ratio	4.34	4.28	4.06	3.57	n/a

Source: socioeconomic data used in the MWCOG 2010 Constrained Long-Range Transportation Plan

Prince William District #2 Needs

As noted above, three lots in this district are currently experiencing demand that exceeds available capacity. The proposed Telegraph Road park-and-ride lot will address the recent loss of spaces at Potomac Mills Mall. However, additional spaces will be needed to accommodate the anticipated 19 percent growth in population in this district. An additional **950 spaces** are estimated to be required to keep pace with population growth between 2011 and 2035. This is within the prior study's previously proposed 1,200 space expansion at Horner Road.

2.4 Prince William District #3

Existing Park-and-Ride Lot Utilization

The "Prince William County District #3" portion of the I-95 corridor and locations of park-and-ride lots within this district are illustrated in **Figure 2-4**. Estimated lot capacities and lot occupancy rates are presented in **Table 2-7** (source: VDOT & PRTC park-and-ride inventory). There are an estimated 978 spaces in this district and the overall occupancy rate is 99 percent. Most of this district's parking is at the VDOT US1/Route 234 park-and-ride lot. This lot is chronically over-capacity, with cars parked on adjacent streets. Significant slugging activity occurs at this lot.

Figure 2-4
Prince William District #3 Park-and-Ride Lot Locations

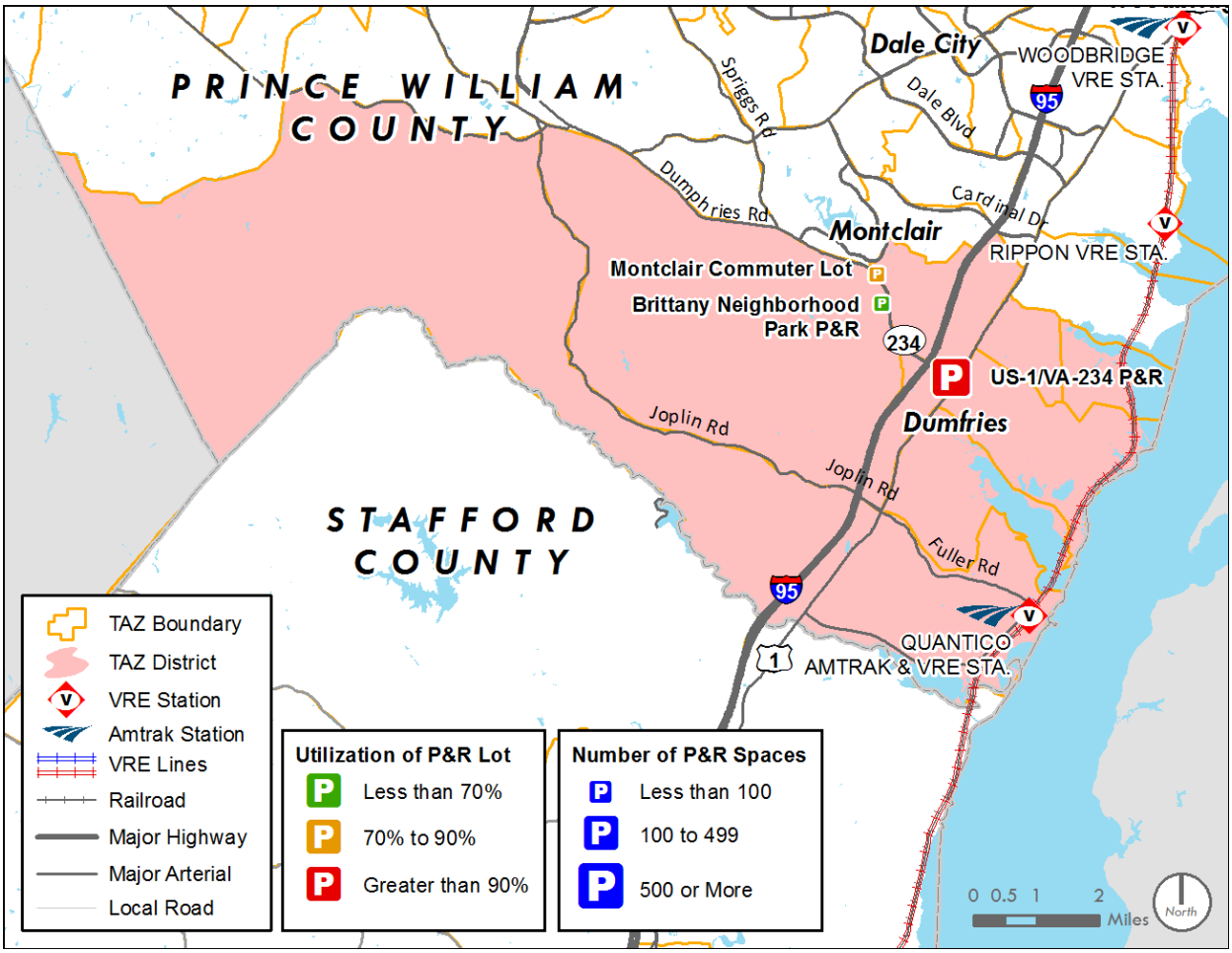

Table 2-7
Prince William District #3 Park-and-Ride Lot Inventory

Lot Name	Lot Location	Lot Capacity	Lot Occ.	Pct. Occ.
US 1/VA 234	**VA 234 & US 1**	**843**	**883**	**105%**
Montclair Commuter Lot	VA 234 North of Stockbridge Drive	50	38	76%
Brittany Neighborhood Park	Exeter Drive off VA 234	85	50	59%
TOTAL		**978**	**971**	**99%**

Note: Lots shown in red are near or at capacity.

Prior Study Recommendations

The prior study identified a need for 500 spaces in the Dumfries area. These spaces were not included in the Fiscally Constrained Plan. However, the Route 234 lot was being expanded at that time, and it was anticipated that those spaces would address the identified future need.

Planned/Programmed Lot Expansion

There are no current plans for lot expansion within this district.

Demographic Projections

Anticipated population and employment characteristics for this district are noted in **Table 2-8** and reflect an employment growth rate that is higher than the district's population growth rate.

Table 2-8
Prince William District #3 Demographic Characteristics

Demographic	2011	2015	2020	2035	'2035-2011 growth
Population	48,403	53,816	56,211	63,394	31.0%
Employment	24,752	26,804	29,465	37,448	51.3%
Pop/Empl. Ratio	1.96	2.01	1.91	1.69	n/a

Source: socioeconomic data used in the MWCOG 2010 Constrained Long-Range Transportation Plan

Prince William District #3 Needs

As noted above, this district has a substantial parking capacity deficiency. Part of the demand at the Route 234 lot may be Stafford County residents. However, there have been no recent surveys to document commuter resident locations at this lot. At least 100 spaces are needed to bring the current utilization rate at this lot down to 90 percent. An additional 300 spaces are needed to keep pace with the anticipated 31 percent population growth in this district, resulting in a need for 400 additional spaces, as shown below.

Existing deficiency needs – 100 spaces
Population growth needs – 300 spaces
Total additional spaces – 400 spaces

Overall, the methodology used to estimate park-and-ride demand results in an estimated need for 2,450 additional spaces for the I-95 portion of Prince William County (Districts 1, 2 and 3, as described above). This happens to the same need identified in the prior *I-95/I-395 Transit & TDM Study*; however the prior study only included 1,450 of that need in its Fiscally Constrained Plan.

2.5 North Stafford County District

Existing Park-and-Ride Lot Utilization

The "North Stafford County District" portion of the I-95 corridor and locations of park-and-ride lots within this district are illustrated in **Figure 2-5**. Estimated lot capacities and lot occupancy rates are shown in **Table 2-9** (source: VDOT & GWRideConnect park-and-ride inventory and counts). There are an estimated 1,575 spaces in this district and the overall occupancy rate exceeds 100 percent. Both lots in this district are chronically over-capacity, with an on-going problem of illegally-parked cars. There is significant carpool, vanpool and slugging activity at both lots.

Figure 2-5
North Stafford County District Park-and-Ride Lot Locations

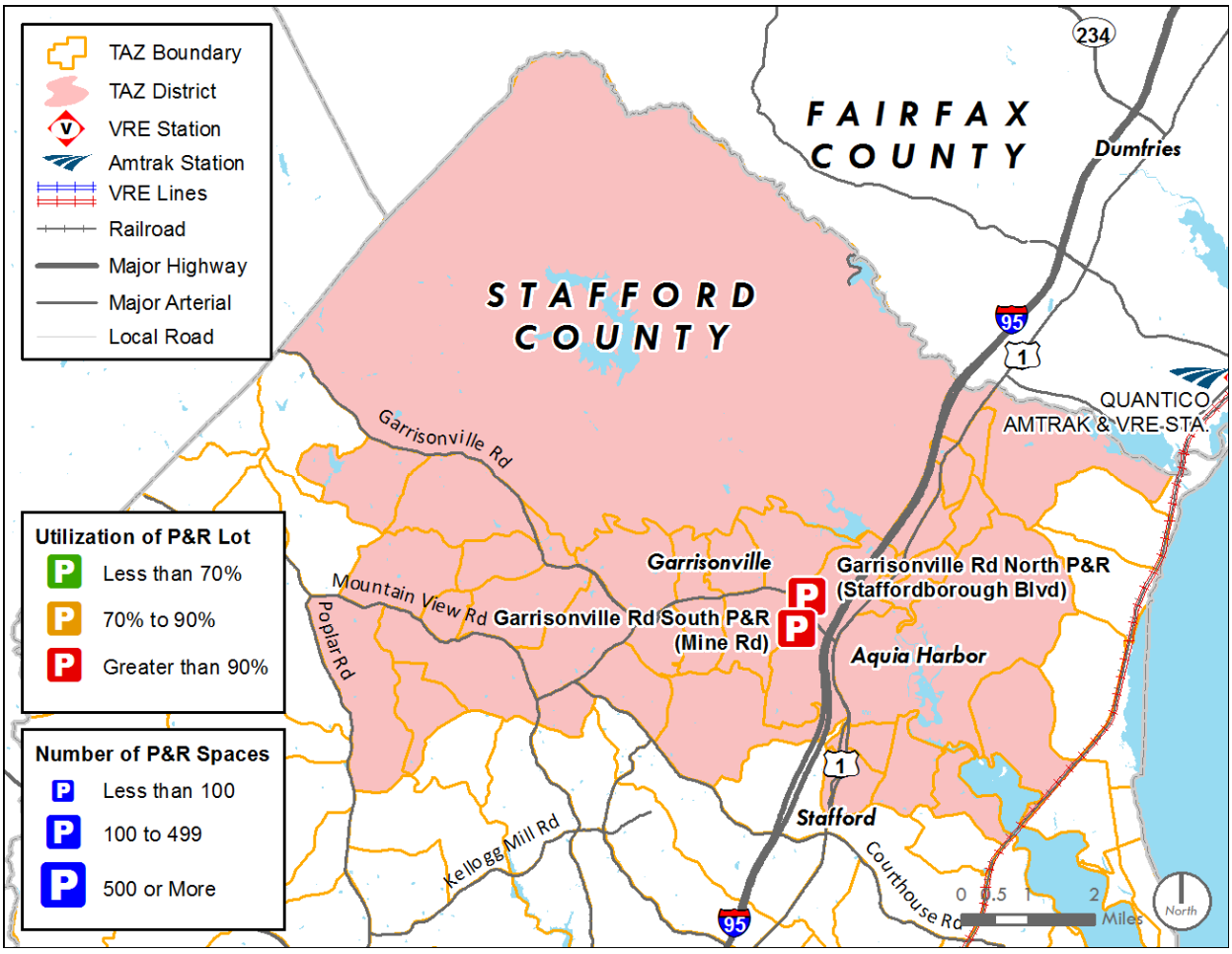

Table 2-9
North Stafford County District Park-and-Ride Lot Inventory

Lot Location	Lot Capacity	Estimated Occ.
Garrisonville Rd. North-Staffordsborough	825	100%+
Garrisonville Rd. North - Mine Road	750	100%+
TOTAL	1,575	100%+

Note: Lots shown in red are near or at capacity.

Prior Study Recommendations

The prior study identified a need for 2,125 spaces in this area. All of these spaces were included in the Fiscally Constrained Plan. A recent park-and-ride study conducted by FAMPO has identified a need for 3,650 spaces in this area, based on anticipated demand as identified in the FAMPO Long-Range Transportation Plan.

Planned/Programmed Lot Expansion

VDOT is in the process of developing plans to expand the Garrisonville Road North-Staffordborough Blvd. lot by up to 1,000 spaces. Estimated construction costs for this lot expansion is $5.8 million. The expanded lot is anticipated to be open by 2015, which coincides with the I-95 HOT/HOV lane opening.

Demographic Projections

Anticipated population and employment characteristics for this district are noted in **Table 2-10** and reflect an employment growth rate that is similar to the district's population growth rate.

Table 2-10
North Stafford County District Demographic Characteristics

Demographic	2011	2015	2020	2035	'2035-2011 growth
Population	64,924	72,010	81,198	108,762	67.5%
Employment	16,055	18,899	21,104	27,718	72.6%
Pop/Empl. Ratio	4.04	3.81	3.85	3.92	n/a

Source: socioeconomic data used in the FAMPO Long-Range Transportation Plan

North Stafford County District #1 Needs

As noted above, this district has a substantial parking capacity deficiency. VDOT's planned expansion of the Staffordborough lot is anticipated to alleviate existing deficiencies and address potential demand for a few years. However, to accommodate this district's anticipated population growth between 2015 and 2035 (51%), an additional 1,300 spaces are anticipated to be needed (in addition to VDOT's planned 1,000 spaces at the Staffordborough lot).

2.6 South Stafford County District

Existing Park-and-Ride Lot Utilization

The "South Stafford County District" portion of the I-95 corridor and locations of park-and-ride lots within this district are illustrated in **Figure 2-6**. Estimated lot capacities and lot occupancy rates are presented in **Table 2-11** (source: VDOT & GWRideConnect park-and-ride inventory and counts). There are an estimated 1,785 spaces in this district and the overall occupancy rate is estimated to be approximately 85 percent. Neither lot in this district has chronic capacity problems.

Figure 2-6
South Stafford County District Park-and-Ride Lot Locations

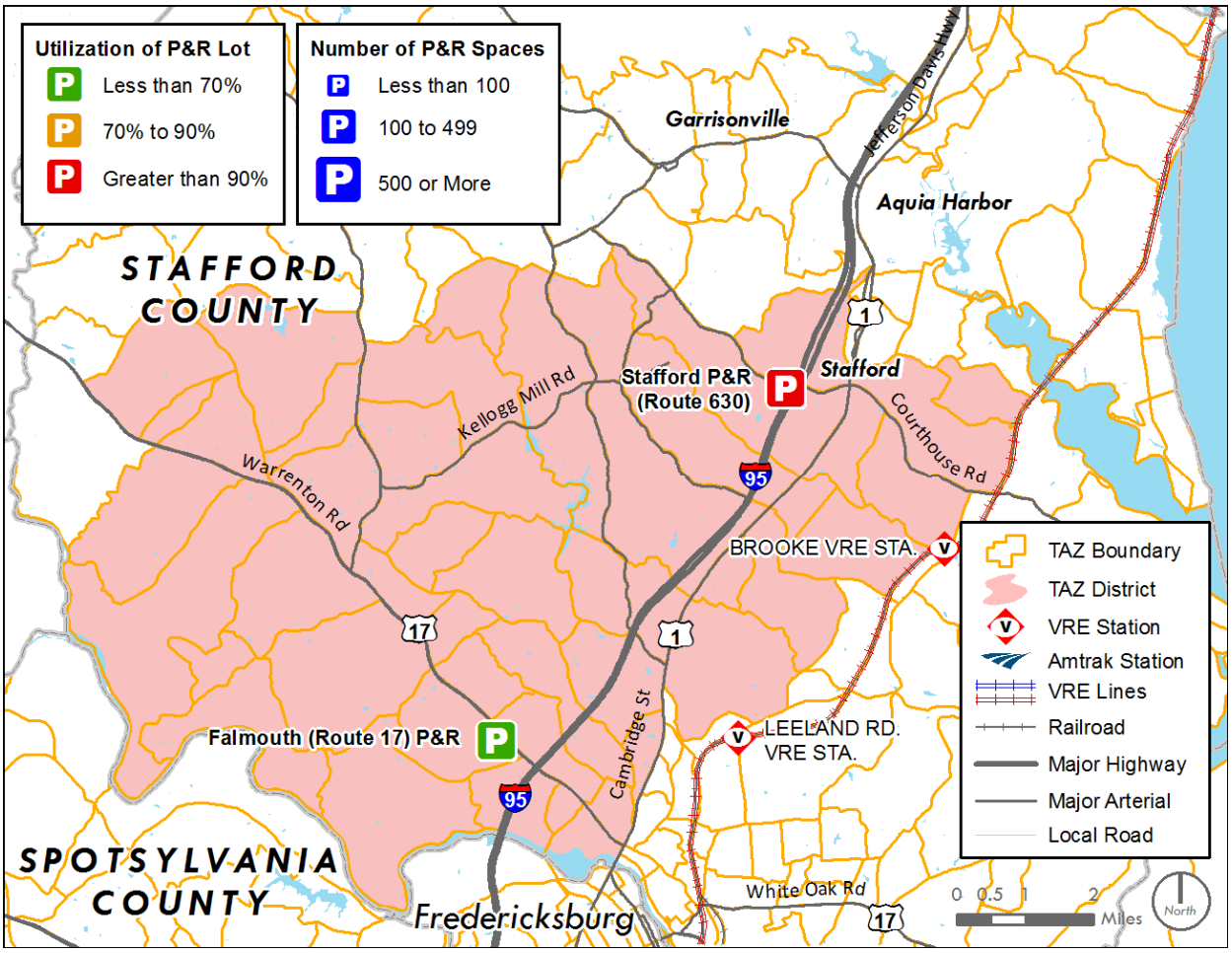

Table 2-9
South Stafford District Park-and-Ride Lot Inventory

Lot Location	Lot Capacity	Estimated Occ.
Route 630 - Stafford	750	85%+
Falmouth (Route 17)	1,035	<85%
TOTAL	**1,785**	**85%**

Note: Lots shown in red are near or at capacity.

Prior Study Recommendations

The prior study did not specifically identify a need for parking spaces in this geographic area.

Planned/Programmed Lot Expansion

VDOT is in the process of developing plans to expand the Garrisonville Road North-Staffordborough Blvd. lot by up to 1,000 spaces. Estimated construction costs for this lot expansion is $5.8 million. The expanded lot is anticipated to be open by 2015, which coincides with the I-95 HOT/HOV lane opening. There are no current plans for lot expansion within this district.

Demographic Projections

Anticipated population and employment characteristics for this district are noted in **Table 2-12** and reflect a population growth rate that is much higher than the district's projected employment growth rate.

Table 2-12
South Stafford County District Demographic Characteristics

Demographic	2011	2015	2020	2035	'2035-2011 growth
Population	38,338	48,665	55,197	74,792	95.1%
Employment	21,811	24,412	26,881	34,286	57.2%
Pop/Empl. Ratio	1.76	1.99	2.05	2.18	n/a

Source: socioeconomic data used in the FAMPO Long-Range Transportation Plan

South Stafford County District Needs

As noted above, this district does not have a current parking capacity deficiency. However, this district is anticipated to experience a 54 percent population growth rate between 2015 and 2035. To accommodate this growth rate, it is estimated that an additional 950 spaces are needed in this district.

2.7 Spotsylvania County/Fredericksburg District

Existing Park-and-Ride Lot Utilization

The "Spotsylvania County/Fredericksburg District" portion of the I-95 corridor and locations of park-and-ride lots within this district are illustrated in **Figure 2-7**. Estimated lot capacities and lot occupancy rates are presented in **Table 2-13** (source: VDOT & GWRideConnect park-and-ride inventory and counts). There are an estimated 2,165 spaces in this district and the overall occupancy rate is estimated to be approximately 85 percent. Utilization rates at both lots along Route 3 are nearing capacity.

Figure 2-7
Spotsylvania County /Fredericksburg District Park-and-Ride Lot Locations

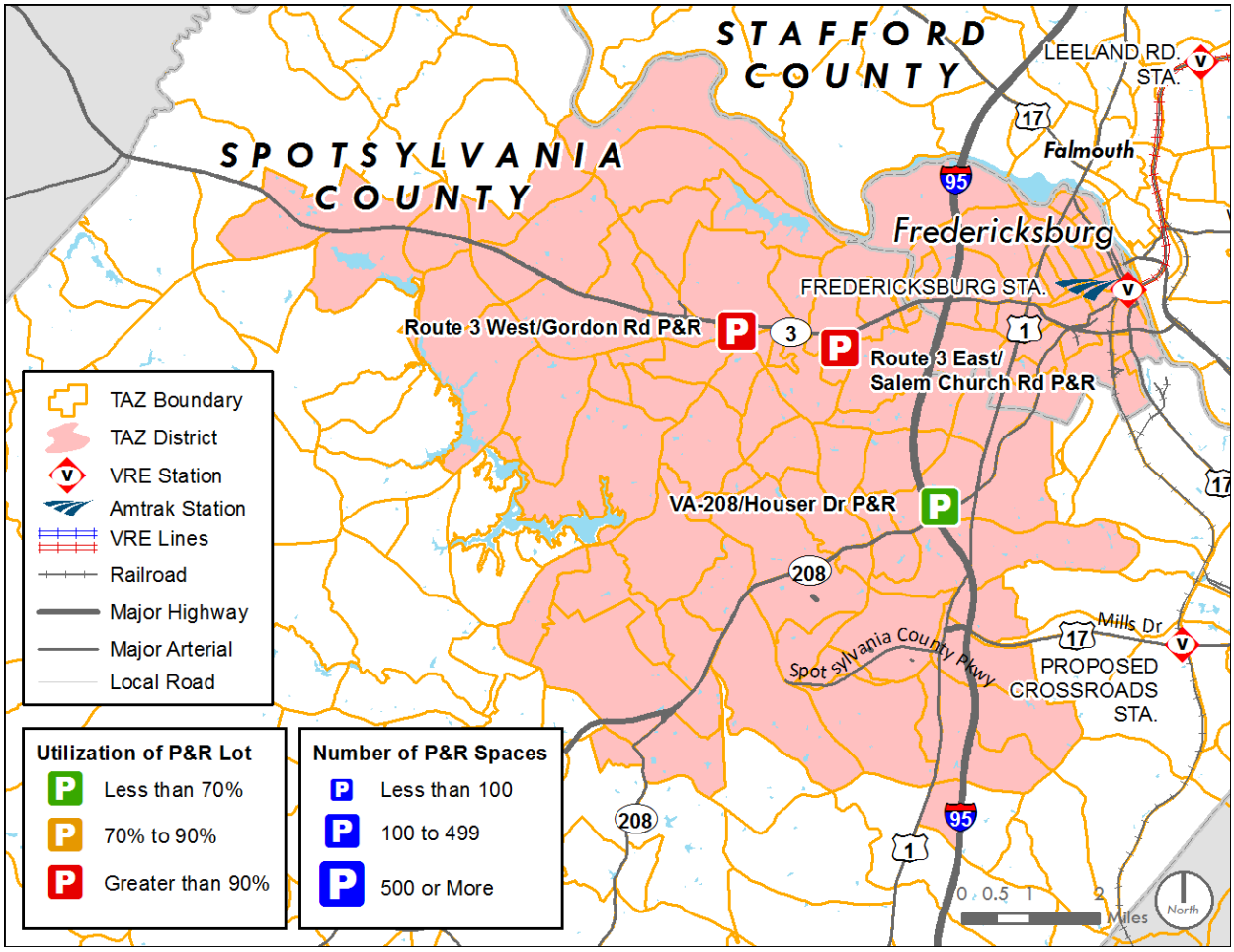

Table 2-11
Spotsylvania County/Fredericksburg District Park-and-Ride Lot Inventory

Lot Location	Lot Capacity	Estimated Occ.
Rte 3 West/Gordon Road	645	90%+
Route 3 East/Salem Church Road	705	90%+
VA 208/Houser Drive	815	<75%
TOTAL	**2,165**	**85%+**

Note: Lots shown in red are near or at capacity.

Prior Study Recommendations

The prior study identified a need for 1,250 spaces in this area of the corridor. The Fiscally Constrained Plan included 475 of these 1,250 spaces. A recent park-and-ride study conducted by FAMPO has identified a need for 1,100 additional spaces in the Route 3 area, and an additional 1,200 spaces in the Massaponax area, based on anticipated demand as identified in the FAMPO Long-Range Transportation Plan.

Planned/Programmed Lot Expansion

VDOT is planning to add up to 1,000 spaces in the Route 3 corridor. Two potential sites have been identified. Estimated opening year is 2017.

Demographic Projections

Anticipated population and employment characteristics for this district are noted in **Table 2-14** and reflect population and employment growth rates that are similar.

Table 2-14
Spotsylvania County/Fredericksburg District Demographic Characteristics

Demographic	2011	2015	2020	2035	'2035-2011 growth
Population	107,337	116,848	129,130	165,974	54.6%
Employment	53,145	56,741	63,104	82,192	54.7%
Pop/Empl. Ratio	2.02	2.06	2.05	2.02	n/a

Source: socioeconomic data used in the FAMPO Long-Range Transportation Plan

Spotsylvania County/Fredericksburg District Needs

Expansion of park-and-ride spaces in the Route 3 corridor (up to 1,000 spaces) is anticipated to address near-term park-and-ride demands through 2020. Beyond that, an additional 1,325 spaces are anticipated to be needed to keep pace with this district's anticipated 42 percent population growth rate between 2020 and 2035.

2.8 Summary of Non-Rail Park-and-Ride Space Needs

The district-level assessment of existing park-and-ride lot utilization and anticipated expansion needs presented in this Technical Memorandum has resulted in the determination of needs that are greater than what was proposed in the prior *I-95/I-395 Transit and TDM Study*. Expansion needs that are anticipated to be needed to address existing lot capacity deficiencies and anticipated population growth within the I-95 travel shed corridor are as follows:

Additional Space Needs in Fairfax & Prince William Counties	4,000 spaces
Additional Space Needs in Stafford and Spotsylvania Counties	5,575 spaces
Total Estimated Park-and-Ride Space Requirement	***9,575 spaces***

The estimated need of 9,575 spaces is much higher than the prior study's estimated need of 6,325 spaces.

As noted in the prior sections, VDOT is proceeding with plans to construct 3,300 spaces. Thus, the estimated net additional need is for **6,275 spaces**. Although this need is higher than what was identified in the prior study, it is supported by the following observations:

- Since completion of the prior study, park-and-ride spaces have been added in the corridor, yet utilization rates have increased, with select lots continuing to have chronic capacity issues.

- Since completion of the prior study, FAMPO has initiated a study that is determining potential sites for an additional 5,950 spaces in the I-95 corridor (at Garrisonville Road, Route 3, and the Massaponax areas). This estimated need is similar to the need for 5,575 spaces that has been identified in this study effort.
- Park-and-ride space needs for the I-95 corridor were discussed with corridor stakeholders, all of which expressed an opinion that the current need for park-and-ride lot expansion was likely greater than what was identified in the prior study.

A summary of revised park-and-ride space requirements for the I-95 corridor is presented below in **Table 2-15**. Although space requirements are shown by district, flexibility should be provided to shift supply based on land availability and anticipated transit services within each district.

Table 2-15
Summary of Revised Park-and-Ride Space Needs Estimates

Corridor Area	District	Needs Estimate	VDOT Programmed Spaces	Remaining P&R Space Needs
North Corridor	Fairfax	850	600	250
	P.W. District #1	1,100	0	1,100
	P.W. District #2	1,650	700	950
	P.W. District #3	400	0	400
North Corridor Total		***4,000***	***1,300***	***2,700***
South Corridor	North Stafford	2,300	1,000	1,300
	South Stafford	950	0	950
	Spotsy./Fred.	2,325	1,000	1,325
South Corridor Total		***5,575***	***2,000***	***3,575***
Entire Corridor		**9,575**	**3,300**	**6,275**

3.0 Bus Transit Service Expansion Needs

The prior *I-95/I-395 Transit and TDM Study* identified a need for significant expansion of bus services in the corridor. To determine if the prior study's stated needs were still valid and appropriate, recommendations from the prior study were identified at a county-level basis (similar to the methodology followed for the park-and-ride assessment). Existing bus service utilization was considered, and current service plan proposals were obtained from the corridor's service providers. Demographic forecasts for each district were determined to assess whether the prior study's stated service needs were still valid, or if there was a basis to modify those recommendations.

3.1 Fairfax County Needs Assessment

Existing Bus Service Characteristics

This area of the I-95 corridor is served by both Fairfax Connector and Metrobus routes. Routes that operate on I-95/I-395 to/from the Pentagon Metrorail station from this portion of the I-95 corridor are as follows:

- ***Route 18 E/F/G/H/J/P*** – There are 22 a.m. peak direction and 29 p.m. peak direction trips on these route patterns that operate to and from the Pentagon. The Rolling Valley park-and-ride lot is the anchor for some of these trips. Other park-and-ride lots that are served by these patterns of Route 18 include Springfield Plaza, the Circuit City site, the American Legion Post and Springfield Methodist Church. Three of these lots currently operate at or beyond capacity. Ridership data from WMATA indicates that typical loads on the 18E and 18P are 15-20 riders per trip, and ridership loads on the 18G/H are 30-35 riders per trip.
- ***Route 395 (Formally 380-D)*** – This Fairfax Connector route provides service along Franconia-Springfield Parkway and provides service to the Gambrill and Backlick North park-and-ride lots. There are 11 a.m. and 11 p.m. peak direction trips to/from the Pentagon on this route. Ridership data from Fairfax Connector suggests that typical loads are around 25 riders per trip.

There are also several Fairfax Connector routes that provide service in the I-95 corridor to and from the Metrorail Blue Line's Franconia-Springfield Station. Those include:

- 171 – Richmond Highway
- 304- Saratoga
- 305 – Newington Forest
- 310 – Franconia Road-Rolling Valley
- 321/322 – Springfield Clockwise/Counterclockwise
- 331/332 – I-95 Clockwise/Counterclockwise

Prior Study Recommendations

The prior study identified the following three potential new routes for the Fairfax County portion of the corridor:

- Lorton VRE-EPG-Ft. Belvoir Shuttle
- Franconia-Springfield Metro-EPT-Ft. Belvoir Shuttle
- Lorton/Laurel Hill-EPG-Pentagon Express

The Lorton/Laurel Hill-EPG-Pentagon Express route was not included in the prior study's "Refined Alternative." Only the Lorton VRE-EPG-Ft. Belvoir shuttle was included in the Fiscally Constrained Plan.

Planned/Programmed Transit Services

Since completion of the prior *I-95/I-395 Transit & TDP Study*, Fairfax County has completed a TDP that includes detailed service recommendations for this portion of the I-95 corridor. Fairfax County is proceeding with implementation of many of the service proposals that were identified in the TDP, with some adjustments to the original TDP service plans. Current County service plans that are proposed for implementation in the near-term, or have recently been implemented include the following:

I-495 HOT/HOV Lane Express Routes to Tysons

- Lorton park-and-ride-Sydenstricker-Lorton-Tysons
- Franconia/Springfield-Tysons
- Burke Centre-Tysons (non-I-95 corridor service)
- All routes would operate at 15-minute frequencies in the peak periods

I-95/I-395 Express Routes

- Route 380-D has recently been re-labeled as Route 395, with no change in service

Fairfax Connector Local Route Changes

- Route 171 has recently been broken into two routes – 171 and 371. Route 171 would terminate at Lorton VRE, and Route 371 would operate from Lorton VRE to Franconia-Springfield.
- Route 331 and 332 (I-95 circulators) have recently been re-labeled as Routes 333/334, with new routing.
- Routes 305 and 307 have recently been combined and called Route 305.

Fort Belvoir Service

- Fairfax County recently began operating Route 335 which links Franconia-Springfield Metro and Fort Belvoir.

Fairfax County District Service Needs

As noted above, several service changes are to be implemented this Fall by Fairfax Connector, thus are considered as "committed" service improvements. Other service modifications from the Fairfax County TDP that would benefit the Fairfax County portion of the I-95 corridor have also been identified. As noted in Section 3.0, VDOT will soon start construction on the Saratoga park-and-ride lot. Some of the improvements would serve this new park-and-ride lot.

Maximization of I-95 HOT/HOV Lane Capacity

As noted earlier, several Fairfax Connector service changes have recently been implemented in September 2011. Additional changes that will directly maximize I-95 HOT/HOV lane capacity that have not yet been implanted include the proposed I-95/I-495 HOT/HOV lane service, from both Sydenstricker/Lorton and Franconia-Springfield Metrorail. Additional needs have also been identified through this study effort, as follows:

- Restructure committed I-95/I-495 service to and from Tysons Corner to include service to the Saratoga park-and-ride lot. This should include restructuring the Sydenstricker-Lorton-Tysons route to include a stop at Saratoga, as well as extending the proposed Franconia-Springfield Metrorail-Tysons route pattern to begin/end at Saratoga.
- Begin new service from Saratoga park-and-ride to/from the Pentagon Station. It is recommended that this new service include at least 5 a.m. and 5 p.m. trips. This service could be operated by either Fairfax Connector or WMATA. It is important to note, however, that bus bay capacity at Pentagon Station is very constrained. Thus, the implementation of this route would require adjustments in schedules of other Pentagon routes, or require the routing of this or other corridor routes other destinations, such as the Franconia-Springfield Metrorail station. Bus capacity concerns at the Pentagon Station are described in greater detail later in this Technical memorandum.

In lieu of a new express route to/from the Saratoga park-and-ride lot, Fairfax Connector Route 395's alignment could be modified to include a stop at this new facility. This is a viable short-term solution to providing service to this facility. However, to be conservative, this report assumes the hours and costs associated with a new route, should it be determined that modification of Route 395 is not feasible.

The additional service needs maximizing the capacity of the I-95 HOT/HOV lanes are estimated to add 2,678 annual revenue-hours of service. This is in addition to revenue-hours already identified in the Fairfax TDP.

Other I-95 Corridor Needs

Service needs that would not directly maximize the capacity of the I-95 HOT/HOV lanes have also been identified, based on recommendations in the Fairfax County TDP, and are as follows:

- Replace Metrobus Route 18R and 18S with Route 18A and 18B
- Fairfax Connector Route 304 – Restructure alignment and operate at 30 peak/60 midday (this route alignment adjustment could provide direct service from the Saratoga park-and-ride lot to Franconia-Springfield Station).
- Fairfax Connector Route 310 – Improve peak period frequencies from 30 to 20 minutes
- Fairfax Connector Route 321/322 – Improve service frequencies to 20 peak/30 midday
- Implement new Fairfax Connector Routes 341/342 – Springfield Circulator at 12 peak/12 midday frequencies. This circulator could provide connectivity between off-site parking in the Springfield area and the Franconia-Springfield Metrorail station.
- Implement a Saratoga-Fort Belvoir shuttle Fairfax Connector route. This proposed new route is suggested as a 30-minute peak period route that would include a stop at the Lorton VRE station.

The additional service needs in the larger I-95 corridor area are estimated to add 41,241 annual revenue-hours of service.

3.2 Prince William County Needs Assessment

Existing Bus Service Characteristics

Existing bus service characteristics are described by service area. PRTC OmniRide routes are generally grouped as Lake Ridge routes, Dale City/Potomac Mills-area routes, and Dumfries/Montclair (South Route 1) routes.

Lake Ridge Area

There are a total of 54 PRTC OmniRide bus trips that operate to and from this area (Prince William District #1 in the park-and-ride assessment). The total number of bus trips that serve this district and destinations served are noted below in **Table 3-1**. The OmniRide routes serve five park-and-ride lots in this district, four of which are operating near or at capacity. Bus loads on these routes are very high, with typical loads often above 40 riders per trip, and with some trips over seated capacity.

Table 3-1
Existing Lake Ridge Area OmniRide Service Characteristics
(Prince William District #1)

Time Period	D.C.	Pentagon	D.C. & Pent.	Tysons*	Total
AM	10	6	2	4	22
PM	12	9	6	5	32
Total	**22**	**15**	**8**	**9**	**54**

** Tysons Service originates at the Woodbridge VRE Station*

Dale City/Potomac Mills Area

This area (Prince William District #2 in the park-and-ride assessment) is also served by PRTC OmniRide service, with many of those trips originating from the Dale City area. There are a total of 82 OmniRide bus trips that operate to and from this district. The total number of bus trips that serve this district and destinations served are noted below in **Table 3-2**. The OmniRide routes serve seven park-and-ride lots in this district, three of which are operating near or at capacity. Bus loads on these routes are very high, with typical loads often above 40 riders per trip, and with some trips over seated capacity.

Table 3-2
Existing Dale City/Potomac Mills Area OmniRide Service Characteristics
(Prince William District #2)

Time Period	D.C.	Pentagon	D.C. & Pent.	Rosslyn/Pent.	Total
AM	22	8	5	4	39
PM	21	7	11	4	43
Total	**43**	**15**	**16**	**8**	**82**

Montclair/Dumfries Area

This area (Prince William District #3 in the park-and-ride assessment) has a total of 33 OmniRide bus trips that operate to and from this district. The total number of bus trips that serve this district and destinations served are noted below in **Table 3-3**. The OmniRide routes serve three park-and-ride lots in this district, with the Route 234 park-and-ride lot operating at capacity. Bus loads on these routes are very high, with typical loads often above 40 riders per trip, and with some trips over seated capacity.

Table 3-3
Existing Montclair/Dumfries OmniRide Service Characteristics
(Prince William District #3)

Time Period	D.C.	Pentagon	D.C. & Pent.	Total
AM	15	0	0	15
PM	0	1	17	18
Total	**15**	**1**	**17**	**33**

Prior Study Recommendations

The prior *I-95/I-395 Transit and TDM Study* identified the following potential service expansion projects for the Prince William County portion of the I-95 corridor.

Proposed service improvements that were included in the Fiscally Constrained Plan were:

- Daly City/Navy Yard OmniRide – add 2 additional trips per peak period
- North Route 1 OmniRide to D.C. – add 3 additional trips per peak period, one midday and one late evening trip (service has been discontinued, thus this prior recommendation is no longer applicable)
- Route 1 OmniLink –Extend route to Ft. Belvoir in the peak periods
- Prince William MetroDirect – Modify route to include circulation in Springfield area
- Woobridge-Lorton-Tysons-Merrifield – New OmniRide route
- Central Prince William-Downtown Alexandria – New OmniRide route
- Lake Ridge-Seminary Road – New OmniRide route

Other proposed service improvements that were included in the study's Refined Alternative, but did not make it into the Fiscally Constrained Plan were:

- Dale City/Lake Ridge-EPG – New OmniRide route
- Woodbridge-EPG – New OmniRide route
- Central Prince William-Pentagon/DC – New OmniRide route
- Dale City/Seminary Road – New OmniRide route

Improvements that were included in the Fiscally Constrained Plan were estimated to add about 66 daily revenue-hours to PRTC service. Other improvements that were in the Refined Alternative, but not included in the Fiscally Constrained Plan add another 31 daily revenue-hours.

Planned/Programmed Transit Services

Since completion of the prior *I-95/I-395 Transit & TDP Study*, PRTC has completed a TDP. Many of the improvement needs identified in the PRTC TDP are based on recommendations from the prior I-95/I-395 study.

Any significant PRTC service expansion is contingent on the opening of a second maintenance facility on the western side of the service area. Currently, PRTC has one bus maintenance and storage facility, which is located at the PRTC Transit Center. Constructed in 1996 to 1997, the maintenance facility and storage yard has capacity for 124 buses. PRTC's current fleet consists of 139 buses, which is increasing to 148 (including contingency) by late 2012. PRTC is constrained by the site from being able to add any more bus storage. To address the storage capacity problem, PRTC has been storing its contingency bus fleet off-site but in close proximity to the Transit Center for the last several years. Thus, PRTC is at practical capacity with regards to bus storage. In addition to the bus storage capacity issue, the number of available maintenance bays at the facility is becoming a limiting factor. Bus bays at the existing facility were designed to handle the original lot configuration of 100 buses, so they are significantly over capacity. To make room for new vehicles, reduce deadheading costs (miles and fuel), and expand its maintenance capacity, PRTC has been actively pursuing the development of a second maintenance facility on the western side of the service area for the past several years. PRTC proposes to have this second maintenance facility operational in FY 2016. Estimated costs for this facility are $12 million.

Also, since the completion of the TDP in early 2011, PRTC's OmniRide services have been experiencing chronic overcrowding (currently on 17% of its scheduled trips). On July 7, 2011 the PRTC Board approved an "overcrowding relief" plan that does not require additional subsidy or the acquisition of any additional buses. Three buses that are over 18-years old have been kept in service for overcrowding relief, with eight morning trips and three afternoon trips added to the schedule. All but two of the additional trips have been added to routes serving the I-95 corridor (Dale City/State Department, Dale City/Pentagon/Navy Yard, and Montclair). Implementation of this plan substantially improves the situation, but has not entirely eliminated overcrowding.

Prince William County Service Needs

After review of the prior study's recommendations, the PRTC TDP and discussion with PRTC staff, a number of service needs have been identified for this portion of the I-95 corridor.

<u>Maximization of I-95 HOT/HOV Lane Capacity</u>

Address Immediate Bus Trip Overcrowding

As noted in the prior section PRTC recently implemented eight new a.m. and three new p.m. OmniRide trips to address immediate concerns with bus trip overloads. Bus loads in the a.m. peak have improved, but several p.m. peak trips are still overcrowded.

Expand OmniRide Service to Keep Pace with Population Growth

The I-95 commuter travel shed area is expected to have a population growth rate of 27 percent between 2011 and 2025. An additional 25 a.m. and 25 p.m. OmniRide commuter trips are needed to keep pace with this growth. In addition, through discussions with PRTC staff, it is estimated that an additional 8

a.m. and 12 p.m. trips are needed to address current capacity deficiencies (in addition to the short-term overcrowding plans described above).

Specific service proposals that would address this general service level growth are listed below. It is important to consider the following proposed improvements as *representative* service improvements that fit within the general needs for Prince William County. Specific service improvements should be tailored to address specific needs at the time of implementation.

- *OmniRide Service from the Lake Ridge Area*
  - Add 3 a.m. and 4 p.m. trips to/from downtown Washington, D.C.
  - Add 3 a.m. and 3 p.m. trips to Pentagon
  - Modify trips that presently serve both Pentagon and Washington, D.C. to serve just Washington, D.C. (to free up bus capacity to provide expanded trips that serve just the Pentagon)
  - Begin new service to the Mark Center. Start with 4 a.m. and 4 p.m. trips

- *OmniRide Service from the Dale City/Potomac Mills Area*
  - Add 4 a.m. and 5 p.m. trips to D.C. Some of these trips should go to the Navy Yard area.
  - Add 3 a.m. and 4 p.m. trips to Pentagon
  - Adjust trips that presently serve both Pentagon and Rosslyn to serve just Rosslyn (to free up bus capacity to provide expanded trips that serve just the Pentagon)
  - Add 2 am. and 2 p.m. trips to Rosslyn/Balston
  - Begin new service to the Mark Center. Start with 4 a.m. and 4 p.m. trips.
  - Begin new service to Merrifield via the I-95/I-495 HOT/HOV lanes. Start with 4 a.m. and 4 p.m. trips.

- *OmniRide Service from the Montclair/Dumfries Area*
  - Add 2 a.m. and 3 p.m. trips to Pentagon/D.C.
  - Split evening service patterns so select trips from Washington, D.C. do not stop at the Pentagon (to free up capacity to expand trips that would just serve the Pentagon).
  - Begin new service to Tysons Corner. Start with 4 a.m. and 4 p.m. trips

Increase Prince William MetroDirect Service Levels

It is also recommended that service frequencies on the MetroDirect to Franconia-Springfield be improved from 30 to 20 minutes in the peak periods. This will provide improved connectivity to the Metrorail Blue Line and to commuter destinations served by the Blue Line.

Many of the above-noted improvements are consistent with improvements identified in the prior *I-95/I-395 Transit & TDM Study*. Expansion of the OmniRide service adds 33 a.m. and 37 p.m. trips, and is estimated to add 26,775 annual revenue-hours (slightly more than what was identified in the prior *I-95/I-395 Transit and TDM Study*). Peak period frequency improvements to the Prince William MetroDirect are estimated to add 2,040 additional annual revenue-hours and one peak bus.

Other I-95 Corridor Needs

Extend OmniLink Service to Fort Belvoir

The extension of Route 1 OmniLink service to Fort Belvoir in the peak periods is also an identified need in the larger I-95 corridor area and is consistent with the prior *I-95/I-395 Transit & TDM Study*. Service would remain outside of the post, with transfers for continuation inside the post (via Fort Belvoir's planned internal shuttle, the REX and the proposed Franconia-Springfield-Fort Belvoir shuttle route). The extension of peak period Route 1 OmniLink service is estimated to add 2 additional peak buses and 4,080 additional annual revenue-hours of service.

3.3 Stafford and Spotsylvania Counties Needs Assessment

Existing Bus Service Characteristics

Stafford and Spotsylvania Counties are served by Martz and Quicks bus service. Park-and-ride lots that are served by these private bus operators are:

- Garrisonville Road – Staffordborough Blvd.
- Garrisonville Road – Mine Road
- Route 17 - Falmouth
- Route 630 – Stafford
- Route 3 – Gordon Road
- Route 3 – Salem Church Road
- Route 208 – Houser Road

Trip patterns for each service provider were noted in Tech Memo #1. There are a total of 24 a.m. and 24 p.m. peak period Quick's and Martz trips originating from Stafford and Spotsylvania Counties. Most bus trips serve more than one park-and-ride lot. The current number of trips to/from destinations are as follows:

- Washington, D.C. – 13 a.m. and 15 p.m. trips
- Pentagon/Crystal City – 5 a.m. and 5 p.m. trips
- Pentagon/Washington, D.C. – 2 a.m. and 0 p.m. trips
- Rosslyn – 1 a.m. and 1 p.m. trip
- Navy Yard/DOT – 1 a.m. and 1 p.m. trip
- Mark Center/Bailey's Crossroad – 1 a.m. and 1 p.m. trip
- Fort Belvoir – 1 a.m. and 1 p.m. trip

Prior Study Recommendations

The prior *I-95/I-395 Transit and TDM Study* did not have recommendations for service to/from specific park-and-ride lots at the south end of the corridor. It did, however, include the following proposed service improvements that were included in the Fiscally Constrained Plan:

- Fredericksburg-D.C. – 30-minute peak period frequencies
- Fredericksburg-Pentagon/Crystal City – 30-minute peak period frequencies
- Massaponax-D.C. – 30-minute peak period frequencies

Other proposed service improvements that were included in the study's Refined Alternative, but did not make it into the Fiscally Constrained Plan were:

- Fredericksburg-Tysons-Merrifield
- Fredericksburg-EPG-Ft. Belvoir

The prior study also considered a Fredericksburg-Rosslyn-Balston route, which was not included in the study's Refined Alternative.

Improvements that were included in the Fiscally Constrained Plan were estimated to require about 61 daily revenue-hours. Other improvements that were in the Refined Alternative, but not included in the Fiscally Constrained Plan require 31 daily revenue-hours.

Planned/Programmed Transit Services

Since this portion of the corridor is served by private bus operators, there are no specific expansion plans. Service expansion by the private operators will be triggered by a demonstrated demand, with the ability for the operator(s) to provide the service in a profitable manner. The potential to attract new riders, however, is presently severely limited because of park-and-ride lot capacity constraints. As noted earlier, many of the lots in this portion of the corridor are operating at or beyond capacity. Parking lot expansion will be required to accommodate any significant increase in bus service levels.

Stafford and Spotsylvania County Service Needs

Population within the commuter bus travel shed corridor for Stafford and Spotsylvania Counties is estimated to grow by 66 percent between now and 2035. To keep up with this growth, it is estimated that commuter bus service should grow by at least 16 trips in each peak period. The implementation of expanded transit service and specific new route patterns by the existing private operators will need to be based on a demonstrated ridership demand. For purposes of this study, it is assumed that transit service demand will increase at a rate commensurate with population growth, and that the private operators will find it profitable to expand transit service to meet this demand through subscription bus service.

<u>Maximization of I-95 HOT/HOV Lane Capacity</u>

A potential service expansion plan has been defined for purposes of this study, and is presented below. Again, this plan assumes the private operators will find demand sufficient to profitably expand transit services at a rate that keeps pace with anticipated population growth. Thus, there is no certainty that demand will warrant service expansion as assumed under this service plan.

Washington, D.C. Service

- Existing Trips - 13 a.m. and 15 p.m. trips
- Proposed Additional Trips = 6 a.m. and 6 p.m. trips

Pentagon Service

- Existing Trips - 5 a.m. and 5 p.m. trips
- Proposed Additional trips = 2 a.m. and 2 p.m. trips

Mark Center Service

- Existing Trips - 1 a.m. and 1 p.m. trip
- Proposed Additional Trips - 2 a.m. and 2 pm. trips

Navy Yard/DOT Service
- Existing Trips - 1 a.m. and 1 p.m. trip
- Proposed Additional Trips - 1 a.m. and 1 p.m. trip

Rosslyn Service
- Existing Trips - 1 a.m. and 1 pm. trip
- Proposed Additional Trips - 2 a.m. and 2 p.m. trips

Fort Belvoir Service
- Existing trips - 1 a.m. and 1 p.m. trip
- Proposed Additional Trips - 1 a.m. and 1 p.m. trip

Tysons Corner Service
- Existing trips - No existing service
- Proposed Additional Trips - 2 a.m. and 2 p.m. trips

In addition to the proposed service expansion, it is likely that increased demand will necessitate the consolidation of bus stop patterns at Stafford and Spotsylvania County park-and-ride lots. Demand will likely increase to a level that supports more direct commuter bus routing, without mid-route stops at additional park-and-ride lots.

It is also important to note that transit capacity at the Pentagon Station is very constrained (a major destination for commuters from this portion of the I-95 corridor). Further expansion of commuter bus trips to and from the Pentagon will be difficult. Prior to implementation, it will be necessary to determine available bus bay capacity. Existing Pentagon-destined commuter bus trips also presently operate to/from Crystal City. There is no additional capacity to add bus service at proposed Crystal City transitway bus stops (described later in this Technical Memorandum). Thus, any additional bus service from the I-95 corridor will need to identify alternative stop locations in the Crystal City area, or consider turning back service in the Pentagon City area. It may be necessary to route commuter bus trips to the Franconia-Springfield Station instead of to the Pentagon.

Proposed expansion of the private operator service from Stafford and Spotsylvania Counties, as reflected in this Needs Plan, adds 16 a.m. and 16 p.m. trips, and is estimated to add about 12,240 annual revenue-hours of service.

3.4 BRAC-Related Needs Assessment

Transportation Management Plans (TMPs) have been developed for the BRAC sites at Mark Center (BRAC-133) and Ft. Belvoir/Ft. Belvoir North. Access to the BRAC-133 Facility at Mark Center will be aided by the I-95 at Seminary Road HOV/Transit ramp. All of the plans that follow are considered as committed service improvements serving the larger I-95 corridor area.

Other I-95 Corridor Needs

Proposed transit service plans for the BRAC-133 site include:

- Alexandria Transit Company's DASH system is proposed to include shuttle service from King Street Metro to the BRAC-133 Facility at the Mark Center with ten-minute headways during peak periods. The general public can ride the express buses on a fare basis; Department of Defense Mark Center personnel and contractors ride free by showing appropriate ID.
- The Department of Defense (DoD) has proposed funding and operating shuttles from the Franconia-Springfield Metrorail Station to the BRAC-133 facility.
- WMATA is planning on implementing the following new services and changes to existing service effective Fall 2011:
    - Mark Center-Pentagon Line, Route 7M: New express service between the Pentagon and Mark Center via I-395. Will operate every 10-15 minutes from 5:40 a.m. to 7 p.m. DoD employees ride free with I.D.
    - Lincolnia-Park Center-Pentagon Line, Routes 7W, 7X: Reroute via Mark Center and modify routing/stops in Southern Towers
    - Foxchase-Seminary Valley Line, Route 8W: Extend from Seminary Rd. & Library La. to Mark Center

  Also, Routes 7A and 7F which currently operate via Mark Center every 30-60 minutes seven days a week will continue with no changes in route or schedule at this time. DoD employees with I.D. will be allowed to ride free on any Route 7 line bus (7A, F, M, W, X) operating via Mark Center.

Additional possible changes for December 2011 or later include:

- Extend Route 28X Leesburg Pike limited stop service from Baileys Crossroads to Mark Center
- Modify Routes 25C,D and/or 28F,G to operate via Mark Center
- All routes starting/ending at Southern Towers (7B,D,E,Y) extend to start/end at Mark Center

Transit plans for Fort Belvoir and Fort Belvoir North include:

- Recently implemented internal circulator at Fort Belvoir. It is a 15-passenger van with 30 minute headways, since the installation plans to start small and build up. There is a bus stop at Pence Gate on Belvoir Road near the new Hospital.
- The Department of Defense (DoD) has proposed funding and operating shuttles from the Franconia-Springfield Metrorail Station to Fort Belvoir North.
- A publicly-operated shuttle is also proposed between Franconia-Springfield Station and Fort Belvoir. This shuttle would enter onto the base.
- The existing REX route will run extended evening service until 11 p.m. for Fort Belvoir hospital late night shifts.

3.5 Summary of Transit Service Needs

Tables 3-4 and **3-5** present a summary of transit service needs that have been identified in this Needs Plan. Route improvements that would specifically maximize the capacity of the I-95 HOT/HOV lanes are included in **Table 3-4**. **Table 3-5** presents route improvements in the larger I-95 corridor area.

Several of the proposed service improvements are presently included in other planning efforts. Most of the improvements also are consistent with improvements previously identified in the *I-95/I-395 Transit*

& TDM Study. It is important to note that for purposes of this study, specific service patterns have been proposed. However, flexibility should be allowed to each service provider to refine specific service patterns as needed, to reflect anticipated actual demand patterns.

Table 3-4
Summary of Bus Transit Service Needs to Maximize Capacity of I-95 HOT/HOV Lanes

Imrpr. Status	Operator	Improvement Description
Committed Service Improvements	Fairfax	Re-label Route 380-D as Route 395
	Fairfax	I-495 HOT Lane Service - Lorton-Tysons
	Fairfax	I-495 HOT Lane Service - Franconia/Springfield-Tysons
Additional Service Needs	Fairfax	Restructure Tysons service to stop at Saratoga pnr
	Fairfax or WMATA	New: Saratoga-Pentagon Express - 5 a.m. and 5 p.m. trips
Committed Service Improvements	OmniRide	Permanently operate additional OmniRide trips that were recently implementd to address overcrowding issues
Additional I-95 Corridor Service Needs	OmniRide	Lake-Ridge-Washington, D.C. - add 3 a.m. and 4 pm. trips
	OmniRide	Lake Ridge-Pentagon/Crystal City - add 3 a.m. and 3 p.m. trips
	OmniRide	New Service - Lake Ridge to Mark Center - 4 a.m. and 4 p.m. trips
	OmniRide	Dale City/Potomac Mills-Washington, D.C. - add 4 a.m. and 5 p.m. trips
	OmniRide	Dale City/Potomac Mills-Pentagon/Crystal City - add 3 a.m. and 4 p.m. trips
	OmniRide	Dale City/Potomac Mills-Rosslyn/Balston - add 2 a.m. and 2 p.m. trips
	OmniRide	New Service: Dale City/Potomac Mills-Mark Center - 4 a.m. and 4 p.m. trips
	OmniRide	New Service: Dale City/Potomac Mills-Merrifield - 4 a.m. and 4 p.m. trips
	OmniRide	Monclair/Dumfries-Pentagon/DC - Add 2 a.m. and 3 p.m. trips
	OmniRide	New Service: Montclair/Dumfries-Tysons Corner - 4 a.m. and 4 p.m. trips
	MetroDirect	Prince William MetroDirect - Increase peak period frequencies to 20-min.
Additional I-95 Corridor Service Needs	Private Op's.	Washington D.C. Service - add 6 trips each peak period
	Private Op's.	Pentagon/Crystal City Service - add 2 trips each peak period
	Private Op's.	Mark Center Service - add 2 trips each peak period
	Private Op's.	Navy Yard/DOT Service - add 1 trip each peak period
	Private Op's.	Rosslyn Service - add 2 trips each peak period
	Private Op's.	Fort Belvoir Service - add 1 trip each peak period
	Private Op's.	Tysons Corner Service - new service, 2 trips each peak period

Table 3-5
Summary of Bus Transit Service Needs in Larger I-95 Corridor Area

Geographic Area	Imrpr. Status	Operator	Improvement Description
Fairfax County	Recently Implemented Improvements	Fairfax	171/371 Route restructuring
		Fairfax	Modify 331/332 into 333/334 I-95 circulators
		Fairfax	Modify 305/307 and label as Route 305
	Additional Service Needs	WMATA	Replace 18R & 18S with 18A & 18B
		Fairfax	Restructure Route 304 - 30 pk/60 midday
		Fairfax	Improve Route 310 service frequencies - 20 pk/30 midday
		Fairfax	Improve 321/322 service frequencies - 20 pk/30 midday
		Fairfax	Route 341/342 Springfield Circulators - 12 pk/12 midday
		Fairfax	New: Saratoga-Fort Belvoir Shuttle - 30 peak
Prince William County	Additional Service Needs	OmniLink	Route 1 OmniLink - extend from Woodbridge VRE to Fort Belvoir - peak per.
BRAC-Related Service	Committed Service Improvements	WMATA	New: Route 7M - Pentagon-Mark Center
		WMATA	Routes 7W, 7X, 8W - Route modifications to serve Mark Center
		WMATA	REX - extend evening service for Fort Belvoir Hospital shifts
		Alexandria	DASH Shuttle - King St. to Mark Center
		DoD	Franconia-Springfield-Mark Center Shuttle
		DoD	Franconia-Springfield-Fort Belvoir North Shuttle
		DoD	Fort Belvoir Internal Shuttle
		TBD	New: Franconia-Springfield-Fort Belvoir shuttle - 30 pk/60 midday

4.0 Virginia Railway Express Service and Facility Needs

The prior *I-95/I-395 Transit and TDM Study* also identified a need for significant expansion of VRE facilities and services in the corridor. These needs are not directly related to maximizing the capacity of the I-95 HOT/HOV lanes, but do serve the larger I-95 corridor area.

To determine if the prior study's stated needs were still valid and appropriate, a general assessment of existing VRE service and facilities was completed. Prior *I-95/I-395 Transit & TDM Study* recommendations were documented, as were current VRE service and facility plans, as documented in the VRE Strategic Plan and the VRE FY 2012 budget. VRE service and facility needs were then refined based on more current VRE Plans, anticipated demographic growth for the VRE Fredericksburg Line travel shed and discussions with VRE and VDRPT rail staff.

Existing VRE Service and Facility Characteristics

VRE continues to experience substantial ridership growth on its Fredericksburg Line. Current average daily ridership is about 10,000 riders a day, and is 15 percent higher than last year's (FY 2010) ridership. VRE operates 7 a.m. and 7 p.m. trips (peak direction only), with trainsets ranging from 4 to 8-car trains. Two of the seven morning trips typically experience loads over seated capacity. Four of the seven afternoon trips typically experience loads over seated capacity. The mix of train sets, resulting seated capacity and average May 2011 ridership is shown below in **Table 4-1**.

Table 4-1
VRE Train Capacity/Ridership Comparison
(May 2011)

Trainset	AM Trains	PM Trains
4-Car Trains	1	1
5-Car Trains	1	1
6-Car Trains	4	4
8-Car Trains	1	1
Seated Capacity	*5,606*	*5,606*
Ridership	5,211	5,393
Ridership/Capacity Ratio	0.93	0.96

Parking demand is also high at several VRE stations, particularly at stations at the southern end of the Fredericksburg line. The Brooke, Leeland Road and Fredericksburg Stations typically have occupancy rates over 90 percent. FRED operates two feeder routes to and from the Fredericksburg VRE station.

Finally, it is important to note that VRE has midday storage constraints. The Ivy City yard is presently used for midday storage in Washington, D.C. This yard is presently operating at capacity. VRE is also currently storing one trainset at its Broad Run yard during the midday as an alternative to storing equipment in Washington, D.C. VRE recently constructed a siding at L'Enfant Station, and will soon be installing a switch at the north end of this siding to allow for the storage of up to two trains at this location. VRE is presently exploring other midday storage options, such as the use of outlying yards, turning trains to make a second trip. VRE is also developing, on conjunction with Amtrak, options for expanding midday storage capacity at the Ivy City yard.

Prior Study Recommendations

The prior *I-95/I-395 Transit and TDM Study* included the following VRE recommendations in both the Refined Alternative, and the Fiscally Constrained Plan:

- Increase train size so 3 trains have 8 cars and 4 trains have 6 cars
- Increase number of VRE trains from 14 to 20 per day
- Extend platforms at 4 stations to more easily accommodate longer train consists
- Expand overnight storage in Fredericksburg
- Add 1,500 parking spaces at VRE stations – 200 at Brooke, 500 at Leeland and 800 at Fredericksburg

The prior study assumed an agreement with Amtrak would be in place to expand midday storage at Ivy City and construct L'Enfant Station storage tracks.

In addition to the improvement recommendations identified above, the *I-95/I-395 Transit & TDM Study* considered the following VRE improvements that did not make it into the Refined Alternative:

- Further expand train trips from 20 to 32 trips per day
- Construct a new station in Spotsylvania County
- Construct a new station at Widewater in Stafford County

Planned/Programmed Transit Services

VRE completed a Strategic Plan in 2004, and is presently updating the Strategic Plan. The Strategic Plan identified three potential phased capital growth strategies: targeted growth, aggressive growth and deferred growth. The following capital improvement elements were identified for each growth strategy:

Station Parking Expansion

- Proposed parking expansion on the Fredericksburg line ranged from 785 (low growth) to 2,775 (high growth).

Suburban Station Improvements

- Fredericksburg – Additional parking at Fredericksburg Station
- Quantico – Rehabilitation of the Quantico historic station building (this project is complete)
- Woodbridge – A second passenger platform on west side of tracks and a second parking garage (the second platform is complete, current parking demand has been determined to not warrant a second parking garage)
- Lorton – a second passenger platform on the west side of the tracks
- Rippon – a second passenger platform on the west side of the tracks
- Cherry Hill – a new station between Rippon and Quantico Stations, with 200-300 initial spaces, 600 spaces in the future

Rolling Stock

- 100-160 coach cars and 20-27 locomotives, depending on growth strategy (for full VRE system)

Operating Improvements

- Expand from 7 to 8 trains/peak period by 2015
- Expand from 8 to 9 trains/peak period by 2025

Other System Improvements

- Service extension to Spotsylvania County
- Expansion of existing midday storage at the Ivy City Coach Yard at Washington Terminal
- Continual rail infrastructure improvements

In addition to VRE's Strategic Plan, the VRE FY 2012 budget includes a six-year (FY 2012-FY 2017) Capital Improvements Program (CIP). This document more accurately reflects VRE's intended capital projects for the near-term period. Major capital projects in the CIP that directly impact the Fredericksburg Line are as follows:

- Spotsylvania County third track project – completion proposed by 2015, fully funded
- Midday storage expansion – completion proposed by 2016, partially funded
- Rolling stock replacement/expansion – purchases proposed through 2016, partially funded
- Heavy maintenance repair facility – completion proposed by 2017, partially funded
- Positive train control – completion proposed by 2014 – unfunded

Demographic Growth Projections

The Fredericksburg Line's commuter travel shed is anticipated to experience significant population growth through 2035, as noted below in **Table 4-2**, with a much higher growth rate at the southern end of the corridor. Presently, 60 percent of the travel shed's population resides in Fairfax and Prince William Counties. By 2035, nearly ½ of the travel shed's population will be in Stafford and Spotsylvania Counties.

Table 4-2
Population Growth Projections Along the Fredericksburg Line

Corridor Area	2011	2035	% Change
Fairfax & Prince William Counties	442,590	537,702	21%
Stafford, Fredericksburg & Spotsylvania Counties	299,553	504,937	69%
Total	**742,143**	**1,042,639**	**40%**

Notes:

1. *Fairfax and Prince William population totals are for areas along the VRE/I-95 corridor only, and are based on MWCOG demographic projections.*
2. *Stafford, Fredericksburg & Spotsylvania population totals are for the entire jurisdictions and are based on FAMPO demographic projections.*

VRE Service and Facility Needs

The prior *I-95/I-395 Transit & TDM Study* does not include the planned Spotsylvania County VRE Station (those plans moved forward after completion of the I-95/I-395 study). Further, the prior study's proposed growth in train service does not take into consideration VRE's available "train slots" with CSX and existing available capacity. Therefore, short-term VRE recommendations for the Needs Plan are

more consistent with those presented in the VRE Strategic Plan and the VRE proposed FY 2012 budget. VRE is, however, pursuing opportunities to expand available railroad operating capacity or "train slots" to meet long-term needs as outlined in the VRE Strategic Plan.

Train Capacity Expansion

- Immediate term – expand trainsets to four 6-car and three 8-car trains (48 cars/peak period – a 17 percent increase in passenger capacity over existing levels). This recommendation is consistent with the prior I-95/I-395 study.
- Longer-term – add two train trips in each peak period (per the VRE Strategic Plan). Six-car trainsets (in combination with proposed immediate term trainset expansion proposals) result in a 46 percent increase in passenger capacity over today.

New Stations

- Immediate-term – Construct Spotsylvania County station (project already committed)
- Longer-term – Construct Cherry Hill station

Station Platforms

- Extend station platforms at Rippon, Brooke, Leeland and Quantico to more easily accommodate longer train consists.
- Add second platform on the west side of tracks at Lorton (immediate term) and at Brooke, Leeland and Rippon (longer-term)

Station Parking Expansion

- Construct 1,000 spaces at Spotsylvania Station (project already committed)
- Construct 430 spaces at Brooke and Leeland Road Stations (projects already committed)
- Construct 800-space garage at either Fredericksburg or Leeland/Brooke stations

Midday Storage

- Complete north switch at L'Enfant Plaza siding for midday storage use of up to two trains (project already committed)
- Expand storage capacity at north end of service area

Track Capacity Improvements

- Construct 3rd track at Spotsylvania Station (project already committed)
- Construct 3rd track at Cherry Hill
- Add positive train control

Other Improvement Needs

- Expand overnight storage at Crossroads
- Construct heavy maintenance facility (could be located on either the Fredericksburg or Manassas line)

Table 4-3 summarizes the VRE service and facility needs and the funding commitment status of each.

Table 4-3
Funding Commitment Status of VRE Service and Facility Needs

Improvement Description	Funding Committed	Remains Unfunded
Train Capacity Expansion		
Increase train size, so 3 trains have 8-cars and 4 have six cars		
Aditional 7 peak/9 fleet passenger cars required	Partially Committed	
Expand train trips from 7 to 8 trips per peak period (6-car trains)		
Additional 6 peak/8 fleet passenger cars required		X
Further expand train trips from 8 to 9 trips per peak period (6-car trains)		
Additional 6 peak/7 fleet passenger cars required		X
Subtotal		
New Stations		
Construct Spotsylvania County Station (2013)	Locally Funded	
Construct Cherry Hill Station (developer funded)		X
Subtotal		
Station Platforms		
Construct second platforms at 4 stations	Partially Committed	
Extend station platforms at 4 stations	Partially Committed	
Subtotal		
Station Parking		
Construct 1,000 spaces at Spotsylvania Station (2013)	Locally Funded	
Construct 430 surface spaces at Brooke and Leeland Road Stations	X	
Construct 800-space garage at Fredericksburg Station or at Brooke/Leeland		X
Subtotal		
Midday Storage		
Switch at L'Enfant Plaza Station	X	
Expand storage capacity at north end of service area	Partially Committed	
Subtotal		
Track Capacity		
3rd Track at Spotyslvania (2.5 miles)	X	
3rd track at Cherry Hill (11.4 miles)	X	
Positive Train Control	To Be Determined	
Subtotal		
Other		
Overnight storage at Spotsylvania County Station		X
Heavy Maintenance Facility	Partially Committed	

Notes:

1. Train Capacity Expansion - Funding is committed for purchase of up to 15 additional passenger coaches.
2. Train Capacity Expansion - Funding for an additional 35 coaches is unfunded at this time.
3. New Stations - No agreement is in place at this time for the owner of Chery Hill station to construct station.

5.0 Transportation Demand Management Program Needs

Existing TDM Programs

There are several TDM programs in place in the I-95 corridor that provide ridesharing opportunities to corridor commuters, and provide opportunities to reduce commuter trips. Those programs include:

Telework Programs

The Telework!VA program by DRPT provides telework training and financial incentives for Virginia businesses to establish or expand telework programs for their employees. Participation in the Telework!VA program has increased exponentially in recent years, especially in Northern Virginia.

There are also three privately-operated telework centers operated by the GWRC - the Fredericksburg Regional Telework Center, the Fredericksburg Telework Center North (also known as the Stafford Telework Center), and the Woodbridge Telework Center.

Finally, it is important to note that there is new legislation that supports telework for federal employees. The Telework Enhancement Act of 2010 (HR 1722) requires each federal agency to designate a Telework Managing Officer, and monitor progress towards a goal of 20 percent of eligible federal workforce teleworking an average of one day per week. Federal telework is supported by Telework Exchange, a public-private partnership.

Slugging/Dynamic Ridesharing

A 2006 study by VDOT estimated that a.m. slugs along the I-95 corridor numbered about 6,450. The 2006 estimates were based on a.m. peak counts at 15 slug line locations along the Virginia I-95 corridor (including slug lines in Fairfax and Prince William counties in the VDOT Northern Virginia District as well as locations in Stafford County and Fredericksburg in the VDOT Fredericksburg District). Over one half of sluggers originate in Prince William County. One third of all sluggers are destined to the Pentagon.

Commuter Connections

Commuter Connections is a regional network of transportation organizations coordinated by the MWCOG, and provides information on the commute options for those who live or work in the Metropolitan Washington, D.C. area. Commuter Connections serves as an umbrella organization across member jurisdictions for regional awareness and marketing services related to improved air quality and reduced automobile emissions. Commuter Connections is a program of the National Capital Region Transportation Planning Board at the MWCOG and is funded by the District, Maryland and Virginia Departments of Transportation as well as the U.S. Department of Transportation.

TDM agencies within the I-95 corridor that are part of the Commuter Connections Network include:

- Local Motion – City of Alexandria
- Fairfax County Transportation Services Group (FCTSG)
- OmniMatch – Potomac and Rappahannock Transportation Commission (PRTC)
- GWRideConnect – George Washington Regional Commission (GWRC)

GWRideConnect, the TDM program by GWRC, currently supports the largest vanpool fleet in the state, manages the AdVANtage vanpool self-insurance program, and is an active partner in regional transit and transportation planning. The program also continues to provide free ridesharing services to assist persons who are seeking daily transportation from the George Washington Region to employment and other destinations in the District of Columbia, Northern Virginia, Richmond, Dahlgren, and the Fredericksburg area. Disseminating information on the range of transportation options available to residents and employees to enable informed transportation decision-making is the core of GWRideConnect's program. **Table 5-1** shows the number of customers served by the GWRideConnect program in 2009.

Table 5-1: GWRideConnect Program Statistics for 2009

	Total	Vehicles Removed Daily	Vehicle Miles Traveled Reduced per Year
Rideshare applicants	2,572	N/A	
Carpools registered	130	260	7,800,000
Vanpools registered	400	4,800	144,000,000,
Commuter bus runs	27	810	24,300,000
Total			*176,100,000*

Source: GWRideConnect, 2035 George Washington Regional Long-Range Transportation Plan.

TDM Plans for BRAC Sites

Finally, it is important to note that the BRAC projects in the corridor include Transportation Management Plans that include support of a telework program, promotion of alternative work schedules, rideshare websites, shuttle service and parking management policies that promote ridesharing.

Prior Study Recommendations

TDM programs that were included in the *I-95/I-395 Transit and TDM Study's* Fiscally Constrained Alternative were as follows:

- *Capital Assistance for Vanpools* – provide financial assistance for the purchase or lease of vans. Provide incentives, IT monitoring and reporting of mileage, promote capital cost of contracting for vanpools. Provide free electronic toll transponders.
- *Enhanced Guarantee Ride Home* – enhanced promotion and operation of this program in the extended corridor. Offer free taxi or rental car transportation to registered commuters who use alternative modes and have a personal emergency during the workday.
- *Carpool Incentives* – provide rewards and incentives for carpoolers.
- *Rideshare Program Operational Support* – fund additional staff for commuter assistance programs in the corridor and feeder markets to promote TDM programs and transit.
- *TDM Programs Marketing* – expand marketing efforts touting TDM programs.
- *Telework Program Assistance* – provide financial incentives and assistance to increase the number of workers teleworking.
- *Vanpool Driver Incentives* – provide incentives to recruit new drivers and retain existing drivers.

- *Vanpool Insurance* – increase vanpool insurance premium pool buy-down for vanpools.
- *VanStart/VanSave* – provide additional financial support to cover the cost of vacant seats for new vanpools during start-up operations, and established vanpools that have temporary vacancies.

Other programs that were included in the prior study's Refined Alternative, but not included in the Fiscally Constrained Plan were:

- *HOVER Pilot Program* – a facilitated park and ride-share system that tracks participant usage, and shares costs and benefits through a combination of financial and "HOVER Ride Credit accounts.
- *Vanpool Tracking for NuRide* – a tracking mechanism to track vans used for vanpools and vanpool riders for NuRide.

In total, the prior I-95/I-395 Study's Refined Alternative includes $59.8 million in TDM programs, of which $20 million was included in the Fiscally-Constrained Plan (2010 dollars).

TDM Program Needs

Prior study recommendations were reviewed with TSM program administrators in the corridor. The majority of the TDM program recommendations made in the prior *I-95/I-395 Transit and TDM Study* are still valid for their potential to maximize the capacity of the I-95 HOT/HOV lanes. However, some recommendations were revisited in light of new programs and updated plans for existing programs. **Table 5-2** indicates the TDM recommendations along with the source study and the location/method of implementation.

Vanpools

In FY 2011, over 500 vanpools were operated in the study area. Of these, 392 were operated in the GWRC area. The GWRC vanpools transported 4,704 persons daily (or about 1,176,000 annually) and reduced 7,769 work trips daily (1,942,250 trips annually). This translated into 466,124 vehicle miles traveled (VMT) reduced daily (116,531,000 VMT reduced annually), and a savings of 23,306 gallons of gasoline daily (5,826,000 gallons annually). The following recommendations support and enhance the vanpool program:

- *VanStart and VanSave:* Additional funding for these programs is a need which would provide short term support (up to six months) to cover the cost of vacant seats until regular riders can be found during the start-up phase or in case of temporary vacancies. Currently, VanSave is in need of funding. VanStart is currently funded through CMAQ. This recommendation was made in the 2008 *I-95/I-395 Transit/TDM Study* and is still valid. As an example of this program's effectiveness, in 2011, GWRideConnect used $20,000 of VanSave funding which helped keep 17 vans in operation.

Table 5-2: TDM Program Recommendations

Improvement Description	I-95/I-395 Transit/TDM Study	Long Range TDM Plans	Other Reference	LOCATION
VANPOOLS				
Van Start and Van Save	X	X		Corridor-wide
Vanpool Insurance - AdVANtage	X	X		Corridor-wide
NTD Vanpool Program Set Up	X		NTD Study	Corridor-wide
TELEWORK				
Telework!VA program funding	X			Corridor-wide
EDUCATION AND MARKETING				
Coordinated I-95 education and marketing campaign				Corridor-wide
TDM Program Staff	X	X		by local program
TECHNOLOGY UPGRADES				
Updated trip-planning, ride matching, and cost sharing technology		X		Corridor-wide
SUPPORTING PROGRAMS				
Enhanced Guaranteed Ride Home	X			Commuter Connections
Carpool incentives	X			Commuter Connections

- *Vanpool Insurance – AdVANtage:* Additional funding for the existing AdVANtage program is a need which would stabilize the existing vanpool self-insurance pool and increase the pool to provide more protection to vanpools at a lower cost. This program was begun with $500,000 instead of the $2 million that was identified in the original *I-95/I-395 Transit & TDM Study*. The program is operated by *GWRideConnect* and the Division of Risk Management for all vanpools in the State. Vanpool operators self-insure themselves with premiums paid into the pool. This program saves vanpool operators thousands of dollars per year and provides up to $14 million more liability protection than previous insurance programs. Currently 180 vanpools are participating in the program, most from GWRC.

- *National Transit Database (NTD) Vanpool Reporting Program Set-up:* Another need identified for vanpools is the establishment of an NTD Vanpool Program which would require vanpools within the program to track trips and passengers served and report this data to the NTD. The program would help obtain 5307 funding for vanpools, and could be self-sustaining in due course. However, funding is required in the initial phase to get it up and running. A recommendation was made in the 2008 *I-95/I-395 Transit/TDM Study* for vanpool driver incentives and subsidies for capital costs for vanpools (including purchase/lease of vans and GPS tracking devices). Vanpools that opt into the NTD Vanpool Program will be eligible to receive funding that may be passed on to vanpool drivers and passengers to cover costs or as incentives. This recommendation will need to be coordinated with the current NTD Vanpool study.

Telework Program Recommendations

- *Telework!VA Program Funding:* There is a need to increase funding for this program which provides financial incentives and training for employers that start new telework programs, funding for home-based equipment costs, and consulting support. In FY 2011, the program provided 35,000/employer to about 25 employers. There is potential to increase the impact of this program to fund 40 employers per year for the next five years. Since telework reduces two trips per teleworking employee per day, this program has a significant impact on maximizing use of the I-95 corridor by removing avoidable trips. This recommendation was made in the 2008 *I-95/I-395 Transit/TDM Study* and is still valid.

Education and Marketing

- *Coordinated I-95 education and marketing campaign:* Develop an integrated education and marketing campaign for all travel services and options in the I-95 corridor, including the HOT/HOV facility, park-and-ride facilities, transit services, and TDM services. The campaign would develop customized resources to disseminate information including websites, maps, brochures, and electronic/social media blasts. The campaign would be ongoing, with two intensive periods of outreach around the opening dates of the northern and southern segments, respectively. While CommuterConnections coordinates a regional marketing program, a targeted I-95 program does not exist currently. This recommendation was made in the 2008 *I-95/I-395 Transit/TDM Study* and is still valid, but with refinements based on input from corridor stakeholders.

TDM Program Staff

- *TDM Staff Expansion:* Add three part-time staff persons to provide TDM program support and commuter assistance in the corridor and feeder markets. A recommendation for additional rideshare program operational support was made in the 2008 *I-95/I-395 Transit/TDM Study*. This recommendation has been refined based on feedback from stakeholders. To illustrate the potential impact of TDM programs, GWRideConnect helps transport 5,844 persons daily (1,461,000 persons annually) and reduces 9,789 work trips daily (2,447,250 trips annually). This translates into 587,324 VMT reduced daily (146,831,000 VMT reduced annually) and 29,366 gallons of gasoline saved daily (7,341,500 gallons annually).

Technology Upgrades

- *Updated trip planning, ride matching, and cost sharing technology:* Upgrade or implement new technology for trip planning and real-time updates, especially to enhance use of transit, dynamic ridesharing, and ride-matching for carpools/vanpools. This would involve reviewing the latest available technology and conducting a pilot study before complete roll-out. Options to be evaluated would include upgrading the existing ride matching databases maintained by local jurisdictions, as well as upgrading and improving integration with the CommuterConnections database. This is a new recommendation based on Long Range TDM Plans and feedback from stakeholders. A pilot study is to be conducted in FY 2013/14, with full roll-out planned for FY 2015

Supporting Programs

- *Enhanced Guaranteed Ride Home:* Enhance promotion and operation of Guaranteed Ride Home (GRH) services in the extended corridor. Offer free taxi or rental car transportation to registered commuters who use alternative modes and have a personal emergency during the workday. This recommendation was made in the 2008 *I-95/I-395 Transit/TDM Study* and is still valid.

- *Incentive programs for Various Commute Modes:* Expand existing incentive programs or institute new programs that support various work commutes (transit, vanpool, carpool, slugging, bike, walk, or telework). Existing programs include Pool Rewards and NuRide. A recommendation was made in the 2008 *I-95/I-395 Transit/TDM Study* for carpool incentives and is still valid. Potential incentives have been broadened to support various commute modes.

Other Recommended TDM Activities

- *Establish a coordinated monitoring program:* Work with stakeholder organizations to jointly identify performance goals for I-95 travel demand and implementation strategies that support corridor TDM goals.

6.0 Destination End Facility Needs

When the *I-95/I-395 Transit and TDM Study* was completed in 2008, the HOT/HOV lanes project was proposed to extend nearly 9 miles north of the current project limits along I-395 to the Potomac River. Thus, the prior study included service and facility recommendations for the portion of the study corridor inside I-495. As noted in the introduction section, service and facility improvement recommendations are focused on the needs that would maximize the capacity of the I-95 HOT/HOV lanes south of I-495. However, consideration has also been given to potential infrastructure impacts and needs at I-95 commuter trip destinations north of I-495.

To determine if the prior study's stated needs were still valid and appropriate, a general assessment of existing destination end facilities was first completed. Prior *I-95/I-395 Transit and TDM Study* recommendations were documented, as were current destination end facility plans. Existing and proposed bus transit service levels at key facilities were identified to assess whether the prior study's stated needs were still valid, or if there was a basis to modify those recommendations.

Existing Destination End Service and Facility Characteristics

I-395 Bus Volumes

As documented in *Technical Memorandum #1*, a significant number of bus routes provide service on I-395 south of the Pentagon (i.e., north of the I-95 HOT/HOV Lanes project). Public operators with bus routes on I-395 include PRTC, Fairfax Connector, WMATA, DASH, ART, Martz and Quick's. Most of these routes terminate at WMATA's Pentagon Metrorail Station/Transit Center, though many PRTC and Martz trips also continue into central Washington, D.C. via the 14th Street Bridge. Just south of the Potomac River, several WMATA and Loudoun County Transit (LCT) trips also enter I-395 and continue north across the 14th Street Bridge into central Washington, D.C.

Pentagon Metrorail Transit Center

At the Pentagon Metrorail Transit Center, there are 21 existing bus bays that are split between a lower and upper level. Most of the 11 upper bays are dedicated to WMATA routes, though ART is the primary user of one bay. Of the 10 lower bus bays, five are dedicated to WMATA, two to PRTC, one to DASH, one is shared by Fairfax Connector and Martz, and one is shared by LCT and Quick's. Specific bus bay assignments were presented in *Technical Memorandum #1*.

Table 6-1 presents the afternoon bus volumes departing Pentagon Metrorail Transit Center in both the peak period and the peak hour. The average bus bay utilization in the p.m. peak hour is 6.5 bus trips per bus bay. Trips operated from the I-95 corridor account for approximately 18 percent of the peak period trips and 15 percent of the peak hour trips in the afternoon. It is important to note that these figures do not include Department of Defense shuttles that also operate into and out of this facility. Overall, bus bay utilization at the Pentagon Transit Center is very high, with bus bays operating at capacity. There is also severe bus congestion getting into and out of the Transit Center.

Table 6-1
P.M. Peak Period & Peak Hour Revenue Bus Trips
Departing Pentagon Station

Bus Routes Operated by:	P.M. Peak Period Bus Trips (3-7 p.m.)	P.M. Peak Hour Bus Trips (4:30-5:30 p.m.)
WMATA	262	92
DASH	22	6
ART	29	9
LCT	7	5
PRTC	50	17
Fairfax Connector	18	5
Martz/Quick's	5	3
TOTAL	**393 trips**	**137 trips**

Note: does not include Department of Defense shuttle trips

Crystal City/Pentagon City Area

Many of PRTC's commuter routes and Quick's and MARTZ buses also serve the Pentagon City/Crystal City area. Generally, morning buses first drop off at the Pentagon Transit Center, and then continue to Pentagon City and Crystal City. Afternoon buses typically start in Crystal City, travel through the Pentagon City to the Pentagon Transit Center, and then head south on I-395. There are high bus volumes and limited curb space for passenger pick-ups and drop-offs in this area. As noted below under the section "Planned/Programmed Improvements", a Crystal City/Potomac Yard Transitway Project is to be constructed that will impact I-95 commuter bus operations in the Crystal City area.

Franconia-Springfield Metrorail Station

The Franconia-Springfield Metrorail Station is the end-of-the-line station for the Blue Line, and is located near the northern terminus of the current I-95 HOT/HOV project. At the Franconia-Springfield Metrorail Transit Center, there are eight existing bus bays. Five of the bays are dedicated to Fairfax Connector routes, one to PRTC, one to WMATA, and one to Greyhound.

Table 6-2 presents the afternoon bus volumes departing Franconia-Springfield Metrorail Transit Center in both the peak period and the peak hour. The average bus bay utilization in the p.m. peak hour is 5.4 bus trips per bus bay.

Table 6-2
P.M. Peak Period & Peak Hour Revenue Bus Trips
Departing Franconia-Springfield Station

Bus Routes Operated by:	P.M. Peak Period Bus Trips (3-7 p.m.)	P.M. Peak Hour Bus Trips (4:30-5:30 p.m.)
WMATA	43	13
PRTC	7	1
Fairfax Connector	96	29
TOTAL	**146 trips**	**43 trips**

Parking demand is also high at the Franconia-Springfield Station. Of the approximately 5,120 parking spaces, more than 4,800 were reported full at maximum occupancy in the 2009 *WMATA Real-Time Parking Information Feasibility Study.* This equates to a 95 percent occupancy rate. The nearby Springfield Mall Macy's garage is also used by many Metrorail commuters for supplemental free parking.

Prior Study Recommendations

The prior *I-95/I-395 Transit and TDM Study* included the following destination end facility recommendations:

- Pentagon Metrorail Transit Center—Facility improvements, including 3 new bus bays and canopies, real time passenger information, traffic circulation/access/egress and security
- Franconia-Springfield Metrorail Transit Center—Facility improvements, including 3 new bus bays and canopies, real time passenger information, traffic circulation/access/egress and security
- Franconia-Springfield Metrorail—Additional 1,925 parking spaces
- Metrorail Extension from Franconia-Springfield to Lorton/Ft. Belvoir
- Metrorail Extension from Lorton/Ft. Belvoir to Potomac Mills

The Metrorail extensions were not included in the prior study's "Refined Alternative." The prior study noted that the demand for additional parking spaces at the Franconia-Springfield Station was not being addressed as part of the study. Only the facility improvements at the Pentagon and Franconia-Springfield Metrorail Transit Centers were included in the Fiscally Constrained Plan.

Planned/Programmed Improvements

WMATA's TIGER Grant for priority bus transit includes funding for station improvements supporting bus priority in the I-95/I-395 corridor. This includes funding for two new bus bays at the Pentagon to address bus bay capacity needs for existing service, and two or three bus bays at the Franconia-Springfield Metrorail Station.

The Department of Defense (DoD) is currently analyzing bus activity at the bays as part of a Transportation Management Plan (TMP), with fieldwork to be completed this summer to determine bus bay utilization rates during peak periods. The purpose of the Pentagon TMP is to identify opportunities to make the Pentagon's transportation system more secure, safer, more efficient and sustainable.

Arlington County and the City of Alexandria are also proceeding with plans to implement a Crystal City/Potomac Yard Transitway. This project will affect commuter bus operations from the I-95 corridor. Dedicated bus lanes are proposed along Crystal Drive, Bell Street and Clark Street in the Crystal City area with bus stops at designated locations. The project's current definition is to permit stop activity for existing commuter bus trips, but there is anticipated to be insufficient capacity to accommodate expanded bus service.

In addition to the projects noted above, a transit center will be opening within the Mark Center on Mark Center Drive. This facility will have five bus bays to accommodate service from WMATA, DASH and commuter bus operators.

Destination End Facility Needs

Maximization of I-95 HOT/HOV Lane Capacity

Mark Center

There are five bus bays at this new transit center. Buses from the I-95 corridor will be able to access the Mark Center via the proposed I-95 HOV ramp to Seminary Road, with a left turn from Seminary Road onto Mark Center Drive. WMATA and DASH have recently begun operating several routes to/from this facility. Discussions with existing operators indicates that there should be adequate bus bay capacity to accommodate additional commuter bus trips from the I-95 corridor that are proposed in this plan. However, bus bay utilization is presently very heavy. Bus schedules and operations among the different service providers will need to be carefully managed – in particular since this is a facility used by different regional operators (public and private).

Franconia-Springfield Metrorail Station

As noted earlier, two or three bus bays will be added at this station through a TIGER grant. With these additional bays, there appears to be adequate bus bay capacity to accommodate proposed I-95 service expansion, as described in this plan. However, coordination will still be needed in the assignment of bus service to bus bays at this station, for there are also planned service increases at this station by the Fairfax Connector and by DoD shuttles.

Parking demand, however, is very high at this station, with the existing parking structure operating near capacity. There may be increased parking demand with the HOT lanes ending north of I-495 (and HOV lanes narrowing from three to two lanes). The extent of this additional demand is not presently known. A potential strategy to address increased parking demands is the expansion of off-site parking, with the off-site parking structure connected to the Metrorail station with frequent bus shuttle service.

Other I-95 Corridor Needs

Pentagon Metrorail Transit Center

This study has identified a need for bus service expansion to/from the Pentagon, but also recognizes that the actual expansion of bus service to this critical destination may not be possible. As noted earlier, two bus bays are to be added at the Pentagon, but these bays are being added to address existing bus bay capacity deficiencies. Further expansion of bus service at the Pentagon is challenging. Potential strategies to accommodate any further bus service expansion could include:

- Careful scheduling management that redistributes bus trips outside of the "peak of the peak" time periods. This requires verification of bus bay utilization at specific times.
- Splitting trips that presently serve multiple destinations. For example, an existing bus trip that serves both the Rosslyn and the Pentagon can be split into two bus trips – one that serves just Rosslyn and the other that serves just the Pentagon. This would increase "seat capacity to the Pentagon (by taking Rosslyn-bound trips off the bus), without increasing vehicle trips into and out of the Pentagon.
- Route new bus trips to the Franconia-Springfield Metrorail station instead of the Pentagon, with passengers continuing their trip via the Metrorail Blue Line.

- Longer-term, consider an off-site bus staging area, with ITS measures in place that could possibly increase bus bay utilization (e.g., real-time information to let a driver know that his/her designated bus bay is available). This measure would require coordination with Arlington County to determine an appropriate off-site location that is in close proximity to the Pentagon.

Any bus service expansion that is targeting service to/from the Pentagon will have to consider the existing capacity constraints at the Pentagon Station, and may need to consider an alternative service delivery strategy such as those described above. The above list is only intended to reflect potential strategies. Actual strategies will need to take many other factors into consideration. For example, the splitting of bus service that presently serves two destinations into two routes will need to take into consideration minimum required service levels to/from each destination.

Finally, it is important to note that the Pentagon Station is a major regional transit facility that is served by numerous transit service providers, not just those providers operating in the I-95 corridor. Thus, capacity expansion issues affect not only I-95 service providers, but other providers as well.

Crystal City/Pentagon City Area

The proposed Crystal City-Potomac Yard Transitway project, as presently defined, restricts expansion of commuter bus service at designated Transitway stops. Potential service strategies in the Crystal City area include:

- Turning back select bus trips at the Pentagon or Pentagon City.
- Splitting trips that presently serve multiple destinations. Trips that presently serve both the Pentagon and Crystal City can be split into two bus trips – one that serves just the Pentagon and the other that serves Pentagon City and Crystal City, thus increasing "seat capacity" to both destinations, but not the number of vehicle trips at each destination.
- Route new bus trips to the Franconia-Springfield Metrorail station instead of Crystal City, with passengers continuing their trip via the Metrorail Blue Line.
- Longer-term, consider a transit center near the Crystal City Metro station.

Once again, the above list reflects potential strategies for consideration. Actual strategies will need to take into consideration a number of factors. Like the Pentagon Transit Center, the Crystal City/Pentagon City area is a major regional destination that is served by numerous transit service providers. Thus, it is important to note that capacity expansion issues affect not only I-95 service providers, but other providers as well.

Other Destination End Facility Needs

In addition to the facility needs described above, other potential destination facility management needs include the management and coordination of slugging locations and bus drop-off/pick-up locations within Washington, D.C. and Arlington.

I-95 Corridor Transit and TDM Plan

Technical Memorandum #3: I-95 Corridor Transit and TDM Plan Recommendations

FINAL

Prepared for:

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ATKINS

CTG Connetics Transportation Group

November 22, 2011

Table of Contents

1.0 Introduction

Virginia is addressing critical transportation needs for the I-95 Corridor. Through a concurrent package of improvements, the Commonwealth will deliver congestion relief, enhance transit and provide new choices on I-95. These concurrent efforts related to the overall strategy to enhance travel and safety are listed below.

1. I-95 HOT/HOV Lanes
2. VDOT Seminary HOV/Transit ramp
3. Transit Improvements

The *I-95 Corridor Transit and TDM Plan* is being developed to provide the Commonwealth of Virginia with recommendations for transit and Transportation Demand Management (TDM), including both operations and capital investments, to complement the I-95 HOT/HOV lanes improvements. It pivots off of the 2008 DRPT *I-95/I-395 Transit/TDM Study*. This plan is being developed with the intent of maximizing utilization of the HOT/HOV lanes network and responding to the demand for increased public transportation and ridesharing.

The *I-95 Transit and TDM Plan* is being developed in collaboration with the Secretary of Transportation and the Virginia PPTA (Public-Private Transportation Act) Office. A multi-jurisdictional Stakeholder Group was formed early in the study process to provide technical input into the study, with meetings at three key points during the course of the study.

This Technical Memorandum is the third and final work product of the *I-95 Corridor Transit and TDM Plan.* It recommends a program of I-95 transit and TDM improvements. Phasing of the transit recommendations and their associated capital and operating costs is proposed in five-year increments between now and 2035. Proposed phasing gives consideration to the opening year of the Phase 1 of the I-95 HOT/HOV lanes project to Garrisonville Road (2015) and the opening year for Phase 2 of the I-95 HOT/HOV Lanes project to US Highway 17 (2018).

Costs and phasing are presented for improvements for which funding is committed and for new proposed transit and facility improvements directly associated with maximizing capacity of the I-95 HOT/HOV lanes south of I-495. Also included are costs and phasing for off-site improvements at the Franconia-Springfield Metrorail Station, which would benefit SOV commuters who must exit the HOT lanes to complete their trips via Metrorail. Other corridor service needs, such as VRE service and facility expansion needs, have been identified in *Technical Memorandum #2*, but are not included in this study's Plan Recommendations, for they do not directly maximize capacity of the I-95 HOT/HOV lanes.

2.0 Non-Rail Park-and-Ride Recommendations

As discussed in *Technical Memorandum #2*, the district-level assessment of existing park-and-ride lot utilization and anticipated expansion needs resulted in the determination of needs that are greater than what was proposed in the prior *I-95/I-395 Transit and TDM Study*. Expansion needs that are anticipated to be needed to address existing lot capacity deficiencies and anticipated population growth within the I-95 travel shed corridor are as follows:

Additional Space Needs in North Corridor Area	4,000 spaces
Additional Space Needs in South Corridor Area	5,575 spaces
Total Estimated Park-and-Ride Space Requirement	***9,575 spaces***

As noted in previous Technical Memoranda, VDOT is proceeding with plans to construct 3,300 spaces. Thus, the estimated net additional need is for **6,275 spaces** (or 9,575 minus 3,300).

2.1 Recommended Phasing of Park-and-Ride Lots

The park-and-ride phasing recommendations acknowledge that the 3,300 spaces VDOT is proceeding with for the I-95 corridor (funded spaces) are anticipated to be complete by approximately 2015, with the 1,300 spaces in the north corridor area (i.e., Telegraph Road and Saratoga lot) complete in 2012-2013 and the 2,000 spaces in the south corridor area (i.e., Route 3/Gordon Road and Garrisonville Road/Staffordborough Blvd.) complete by approximately 2015.

The remaining 6,275 spaces needed for the corridor are assumed to be implemented in five-year increments from 2020 to 2030, as shown in **Table 2-1** and **Figure 2-1**. Phasing of these spaces is cognizant of bus transit service phasing discussed in the next section, as well as discussions with VDOT regarding park-and-ride priorities.

Between 2020 and 2024, a total of 2,075 additional spaces are recommended, consisting of 1,600 in the north corridor area (Fairfax District and Prince William County Districts 2 and 3) and 475 in the south corridor area (Stafford District 2). Between 2025 and 2029, a total of 1,863 spaces are recommended, with the emphasis shifting to the south corridor area. In this five-year increment, 550 spaces are recommended in the north corridor area (Prince William District 1) and a total of 1,313 are recommended in the south corridor area (Stafford District 1 and Fredericksburg & Spotsylvania District). Finally, beginning in 2030, 2,338 additional spaces are recommended, consisting of 550 spaces in the north corridor area (Prince William District 1) and 1,788 spaces in the south corridor area (all three districts).

As noted in this Tech Memo, park-and-ride lot spaces have been recommended by geographic area/district. However, it is important that there be flexibility for VDOT and local jurisdictions to work together to adjust locations of additional park-and-ride spaces as necessary during more detailed park-and-ride lot siting analyses, based on more current estimates of demand, land availability and transit service. Further, FAMPO is presently finalizing a park-and-ride lot study that is identifying potential locations for new park-and-ride lots and/or expansion of existing lots. Recommendations from that study effort should be utilized when identifying potential locations for the additional park-and-ride spaces that are recommended from this study effort.

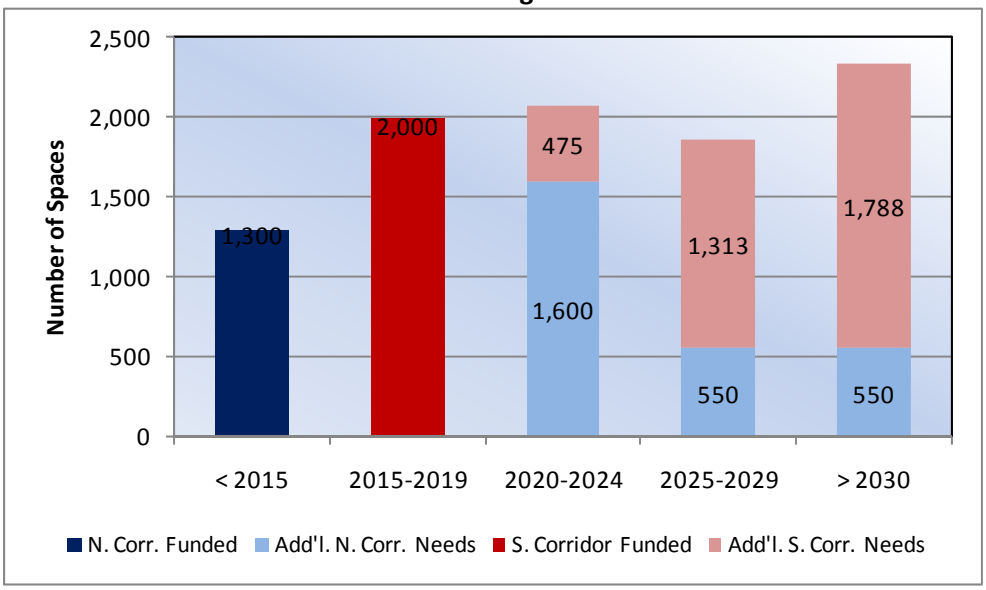
Table 2-1
Park-and-Ride Lot Phasing Recommendations
(Number of Spaces)

Geographic Area	Improvement Description	< 2015	2015-2019	2020-2024	2025-2029	2030-2034	Total
Fairfax District	Saratoga Lot* (2013)	600					**600**
	Additional Needs			250			**250**
Prince William District 1	Additional Needs				550	550	**1,100**
Prince William District 2	Telegraph Rd* (2012)	700					**700**
	Additional Needs			950			**950**
Prince William District 3	Additional Needs			400			**400**
Stafford District 1	Staffordborough Rd. Lot Expansion* (2015)		1,000				**1,000**
	Additional Needs				650	650	**1,300**
Stafford District 2	Additional Needs			475		475	**950**
Fredericksburg &	Route 3 (2017)*		1,000				**1,000**
Spotsylvania District	Additional Needs				663	663	**1,325**
TOTALS		**1,300**	**2,000**	**2,075**	**1,863**	**2,338**	**9,575**
Previously Committed Spaces:		**1,300**	**2,000**	**0**	**0**	**0**	**3,300**
Additional Recommended Spaces:		**0**	**0**	**2,075**	**1,863**	**2,338**	**6,275**

Notes:

1. *Lots with (*) are already programmed for construction by VDOT.*

Figure 2-1
Park-and-Ride Lot Phasing Recommendations



North Corridor defined as Fairfax and Prince William Counties
South Corridor defined as Spotsylvania and Stafford Counties

2.2 Park-and-Ride Lot Capital Cost Estimates

Total capital costs are estimated to be $121.7 million for the 9,575 park-and-ride spaces needed in the I-95 travel shed corridor (in 2011 dollars). As shown in Table 2-2, of that, $22.8 million is committed towards the 3,300 spaces with which VDOT is proceeding, leaving $98.9 million to be added to the Six-Year Improvement Program. Capital cost estimates for the Saratoga, Telegraph Road, and Staffordborough Blvd. lots were provided by VDOT, and the capital costs for the Route 3 lot were assumed to be similar to the Staffordborough Blvd. lot (a capital cost estimate for this committed VDOT project is not yet available). Capital costs for the additional space needs in Prince William District 2 (Horner Road expansion) were suggested by VDOT staff. All other additional needs were based on a per space cost of $15,000 recommended for use by VDOT staff, to account for construction, right-of-way acquisition and site access improvements. Actual costs will, of course, vary depending on the specific conditions of each proposed park-and-ride lot site (e.g., if land is already publically owned, if off-site access improvements are needed, utility work is required, etc.).

Figure 2-2 and **Table 2-2** present estimates of capital costs by phasing increment. Total estimated capital costs (in current year dollars) for the additional recommended parking spaces by five-year increment are as follows:

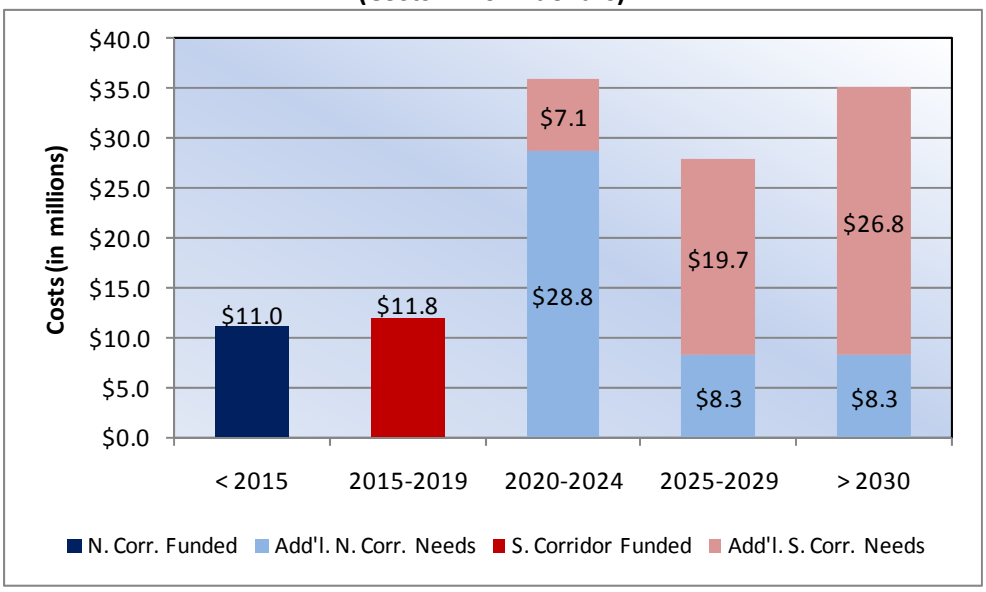
- Between 2015 and 2020, $35.9 million
- Between 2020 and 2025, $27.9 million
- Between 2025 and 2030, $35.1 million

Park-and-ride costs are also presented in Year of Expenditure dollars in Appendix A.

The above-noted cost estimates do not include annual O&M costs for maintaining park-and-ride lots. VDOT is responsible for maintaining all VDOT-owned park-and-ride lots, and is assumed to be responsible for maintenance of the additional park-and-ride spaces recommended in this study.

Maintenance responsibilities include functions such as: snow removal, landscaping, lighting and periodic resurfacing/striping of the parking lots.

Figure 2-2
Park-and-Ride Lot Phased Capital Cost Estimates
(Costs in 2011 dollars)



North Corridor defined as Fairfax and Prince William Counties
South Corridor defined as Spotsylvania and Stafford Counties

Table 2-2
Park-and-Ride Lot Capital Cost Estimates (in 2011 dollars) and Phasing

Geographic Area	Improvement Description	Number of Parking Spaces	Cost/Space	Total Cost	Funding Committed	Remaining Amount	< 2015	2015-2019	2020-2024	2025-2029	2030-2035	2035	Total
Fairfax District	Saratoga Lot* (2013)	600	$5,000	$3,000,000	$3,000,000		$3,000,000						**$3,000,000**
	Additional Needs	250	$15,000	$3,750,000		$3,750,000			$3,750,000				**$3,750,000**
Prince William District 1	Additional Needs	1,100	$15,000	$16,500,000		$16,500,000				$8,250,000	$8,250,000		**$16,500,000**
Prince William District 2	Telegraph Rd* (2012)	700	$11,429	$8,000,000	$8,000,000		$8,000,000						**$8,000,000**
	Additional Needs (Horner Road Expansion)	950	$20,000	$19,000,000		$19,000,000			$19,000,000				**$19,000,000**
Prince William District 3	Additional Needs	400	$15,000	$6,000,000		$6,000,000			$6,000,000				**$6,000,000**
Stafford District 1	Staffordborough Rd. Lot Expansion* (2015)	1,000	$5,900	$5,900,000	$5,900,000			$5,900,000					**$5,900,000**
	Additional Needs	1,300	$15,000	$19,500,000		$19,500,000				$9,750,000	$9,750,000		**$19,500,000**
Stafford District 2	Additional Needs	950	$15,000	$14,250,000		$14,250,000			$7,125,000		$7,125,000		**$14,250,000**
Fredericksburg & Spotsylvania District	Route 3 (2017)*	1,000	$5,900	$5,900,000	$5,900,000			$5,900,000					**$5,900,000**
	Additional Needs	1,325	$15,000	$19,875,000		$19,875,000				$9,937,500	$9,937,500		**$19,875,000**
TOTALS		**9,575**		**$121,675,000**	**$22,800,000**	**$98,875,000**	**$11,000,000**	**$11,800,000**	**$35,875,000**	**$27,937,500**	**$35,062,500**	**$0**	**$121,675,000**
Previously Committed Funds:							*$11,000,000*	*$11,800,000*	*$0*	*$0*	*$0*	*$0*	*$22,800,000*
Additional Recommended Funding:							*$0*	*$0*	*$35,875,000*	*$27,937,500*	*$35,062,500*	*$0*	*$98,875,000*

Notes:

1. *Lots with (*) are already programmed for construction by VDOT.*
2. *Capital costs for the Route 3 park-and-ride lot are assumed to be similar to cost identified for Staffordborough lot expansion.*
3. *Cost for additional needs for Prince William District 2 (Horner Road Expansion) suggested by VDOT staff.*
4. *For all other spaces, $15,000 per parking space was recommended for use by VDOT staff, to account for construction, ROW acquisition and site access improvements.*

3.0 Bus Transit Service Expansion Recommendations

The prior *I-95/I-395 Transit and TDM Study* identified a need for significant expansion of bus services in the corridor. As discussed in *Technical Memorandum #2*, the process of validating and modifying the prior study's stated bus service needs involved comparing the prior recommendations to current service plan proposals, understanding existing bus service utilization (e.g., bus loads), assessing demographic forecasts for each district in relation to transit service levels, and discussing potential service needs with service provider staff. From this effort, *Technical Memorandum #2* identified a refined set of bus service needs for the corridor.

The recommendations for bus transit service expansion include only those route improvements that would directly utilize the I-95 HOT/HOV lanes. The recommended improvements include expansion of commuter services from Spotsylvania, Stafford, Prince William and Fairfax counties. These improvements would serve destinations such as D.C., the Pentagon area, Rosslyn, Mark Center, Tysons Corner, Fort Belvoir North and the Franconia-Springfield Metrorail Station.

3.1 Recommended Phasing of Bus Service Expansion - Operations

Table 3-1 presents the estimated annual revenue hours and proposed implementation year for the bus service expansion routes. The listing of route improvements are divided between committed service improvements and those that are additional service needs. Committed service improvements are assumed to be implemented prior to 2015, and include routes in Fairfax and Prince William County, as well as BRAC-related service improvements. The additional service needs have been phased into 5-year increments from 2015 through 2030, drawing from adopted TDPs and population growth projections. The total proposed increase in annual revenue hours for services that would operate in the I-95 HOT/HOV lanes is 47,940 (this includes hours for continuing the additional I-95 OmniRide service recently implemented by PRTC to address overcrowding issues). **Figure 3-1** summarizes the estimated increase in annual revenue hours by service type or provider. **Table 3-2** and **3-3** identify the recommended increase in commuter bus service trips by county of origin, and by destination.

The service plans recommended in this Tech Memo are based on an analysis of needs that took into consideration existing service utilization, corridor demographic growth, and discussions with corridor service providers. As service providers proceed with implementation of expanded service, flexibility for the local service providers will be important, with service patterns and service levels adjusted as necessary based on a more current assessment of ridership demand.

It is important to note that there are capacity constraints at the Pentagon transit center and in the Crystal City/Pentagon City area. As noted in *Technical Memorandum #2*, potential strategies that may need to be explored to accommodate any further expansion at these locations include:

- Careful scheduling management that redistributes bus trips outside of the "peak of the peak" time periods.
- Splitting trips that presently serve multiple destinations into two or more routes, thus increasing seat capacity to each destination.
- Routing new trips to the Franconia-Springfield Metrorail Station instead of the Pentagon, with passengers continuing their trip via the Metrorail Blue Line. This, however, will also require careful coordination with WMATA, Fairfax Connector and DoD services at the station.

- Longer-term, consideration of an off-site bus staging area at the Pentagon and possibly a transit center near the Crystal City Metro Station, with ITS measures in place that could possibly increase bus bay utilization.

Finally, it is important to note this study's transit service expansion recommendations for Stafford and Spotsylvania Counties assumes continued operation of privately operated transit service in the future, and that demand will exist for these private operators to expand service at a rate consistent with population growth. At some point in the future, consideration may need to be given to public participation in the provision of commuter bus service for Stafford and Spotsylvania Counties, to ensure the continuation and expansion of transit at service levels and service patterns that are beneficial for the I-95 corridor.

Figure 3-1
Increase in Annual Revenue Hours by Service Type/Provider

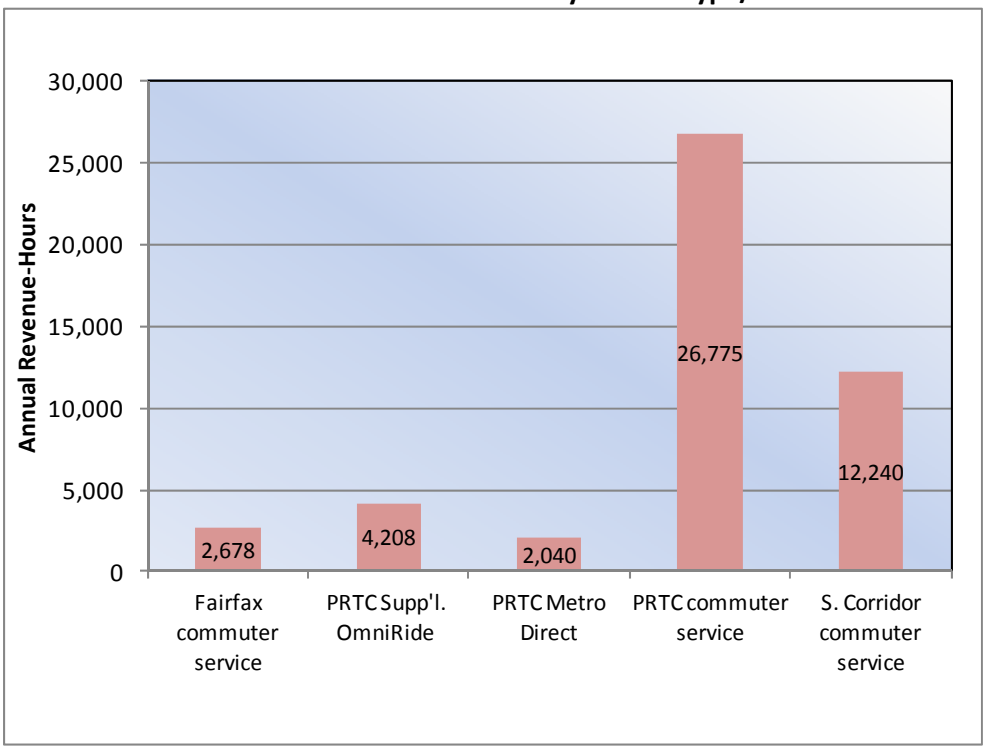


Table 3-1
Bus Service Expansion Recommendations - Revenue Hours and Phasing

Geographic Area	Imrpr. Status	Operator	Improvement Description	Annual Revenue-Hrs.	Impl. Year
Fairfax County	Committed Service Improvements	Fairfax	I-495 HOT Lane Service - Lorton-Tysons	Commmitted.	< 2015
		Fairfax	I-495 HOT Lane Service - Franconia/Springfield-Tysons	Commmitted.	< 2015
	Additional Service Needs	Fairfax	Restructure Tysons service to stop at Saratoga pnr	765	2015
		Fairfax or	New: Saratoga-Pentagon Express - 5 a.m. and 5 p.m. trips	1,913	2015
Prince William County	Committed Service Improvements	OmniRide	Permanently operate additional OmniRide trips that were recently implementd to address overcrowding issues	4,208	2015
	Additional I-95 Corridor Service Needs	OmniRide	Lake-Ridge-Washington, D.C. - add 3 a.m. and 4 pm. trips	2,678	2025
		OmniRide	Lake Ridge-Pentagon/Crystal City - add 3 a.m. and 3 p.m. trips	2,295	2025
		OmniRide	New Service - Lake Ridge to Mark Center - 4 a.m. and 4 p.m. trips	3,060	2015
		OmniRide	Dale City/Potomac Mills-Washington, D.C. - add 4 a.m. and 5 p.m. trips	3,443	2020
		OmniRide	Dale City/Potomac Mills-Pentagon/Crystal City - add 3 a.m. and 4 p.m. trips	2,678	2025
		OmniRide	Dale City/Potomac Mills-Rosslyn/Balston - add 2 a.m. and 2 p.m. trips	1,530	2020
		OmniRide	New Service: Dale City/Potomac Mills-Mark Center - 4 a.m. and 4 p.m. trips	3,060	2015
		OmniRide	New Service: Dale City/Potomac Mills-Merrifield - 4 a.m. and 4 p.m. trips	3,060	2020
		OmniRide	Monclair/Dumfries-Pentagon/DC - Add 2 a.m. and 3 p.m. trips	1,913	2020
		OmniRide	New Service: Montclair/Dumfries-Tysons Corner - 4 a.m. and 4 p.m. trips	3,060	2020
		MetroDirect	Prince William MetroDirect - Increase peak period frequencies to 20-min.	2,040	2020
Stafford and Spotsylvania Counties	Additional I-95 Corridor Service Needs	Private Op's.	Washington D.C. Service - add 6 trips each peak period	4,590	2020
		Private Op's.	Pentagon/Crystal City Service - add 2 trips each peak period	1,530	2020
		Private Op's.	Mark Center Service - add 2 trips each peak period	1,530	2020
		Private Op's.	Navy Yard/DOT Service - add 1 trip each peak period	765	2025
		Private Op's.	Rosslyn Service - add 2 trips each peak period	1,530	2025
		Private Op's.	Fort Belvoir Service - add 1 trip each peak period	765	2015
		Private Op's.	Tysons Corner Service - new service, 2 trips each peak period	1,530	2025
TOTALS				**47,940**	

Table 3-2
Increase in Commuter Bus Trips by County of Origin

Commuter Trip Origins:	AM Peak Period Trips			PM Peak Period Trips		
	Existing	Proposed	% Change	Existing	Proposed	% Change
Stafford/Spotsylvania Counties	24	40	67%	24	40	67%
Prince William County	82	118	44%	99	139	40%
Fairfax County	33	46	39%	40	53	33%
Total	**139**	**204**	**47%**	**163**	**232**	**42%**

Notes:

Fairfax Connector proposed trips Include I-495 Tysons Express Routes

Prince William County trips include MetoDirect service to Franconia-Springfield

Table 3-3
Increase in Commuter Bus Trips by Destination

Commuter Trip Destinations:	AM Peak Period Trips			PM Peak Period Trips		
	Existing	Proposed	% Change	Existing	Proposed	% Change
Central D.C. Area	127	160	26%	150	187	25%
Mark Center	1	11	1000%	1	11	1000%
Tysons	4	22	450%	5	23	360%
Other	7	11	57%	7	11	57%
Total	**139**	**204**	**47%**	**163**	**232**	**42%**

Notes:

Destinations included in "Other" are: Fort Belvoir, Franconia-Springfield

Capacity contraints at Pentagon may necessitate the need for commuter trips to be routed to other destinations, such as Franconia-Springfield

3.2 Recommended Phasing of Bus Service Expansion – Buses Required

Table 3-4 shows phasing of the additional buses that would be required to implement the bus service expansion identified in the previous section by five-year increment, including both peak buses and spares. Bus purchase recommendations include replacing the retirement-eligible buses that PRTC recently put back into service to address current bus overcrowding issues. Note that these additional bus requirements do not take into account bus life cycles and bus replacement costs over the plan's time period. A total of 46 additional buses are required to implement the non-committed service improvements that would utilize the I-95 HOT/HOV lanes.

3.3 Bus Service Expansion O&M Cost Estimates

Figure 3-2 summarizes the estimated annual O&M costs for the bus service expansion routes. **Table 3-5** presents estimated O&M costs for bus service expansion routes. This table does not include costs associated with service improvements that are already committed for implementation. An average annual O&M cost of $120 per revenue hour has been assumed based on a review of current costs for WMATA, Fairfax Connector and PRTC. The calculations of net O&M costs reflect net O&M costs after fare collection, based on assumed farebox recovery ratios for the various services/operators (noted in footnotes of the tables).

The total estimated annual net O&M cost for all improvements associated with routes that operate in the I-95 HOT/HOV lanes is $2.47 million (2011 dollars). Additional annual O&M costs builds with the phased implementation of service expansion, with the full $2.47 million in additional O&M costs beginning in 2025, as illustrated in Figure 3-2. **Table 3-3** also presents the cumulative O&M costs through 2035, taking into account the proposed implementation year (e.g., an improvement proposed for 2020 would have 15 cumulative years of O&M). The additional net O&M costs through 2035 are estimated at $39.0 million for routes that would operate in the I-95 HOT/HOV lanes (2011 dollars). Bus O&M costs are also presented in Year of Expenditure dollars in Appendix A.

Figure 3-2
Net Annual O&M Costs for Bus Service Recommendations by Five-Year Increment (2011 dollars)

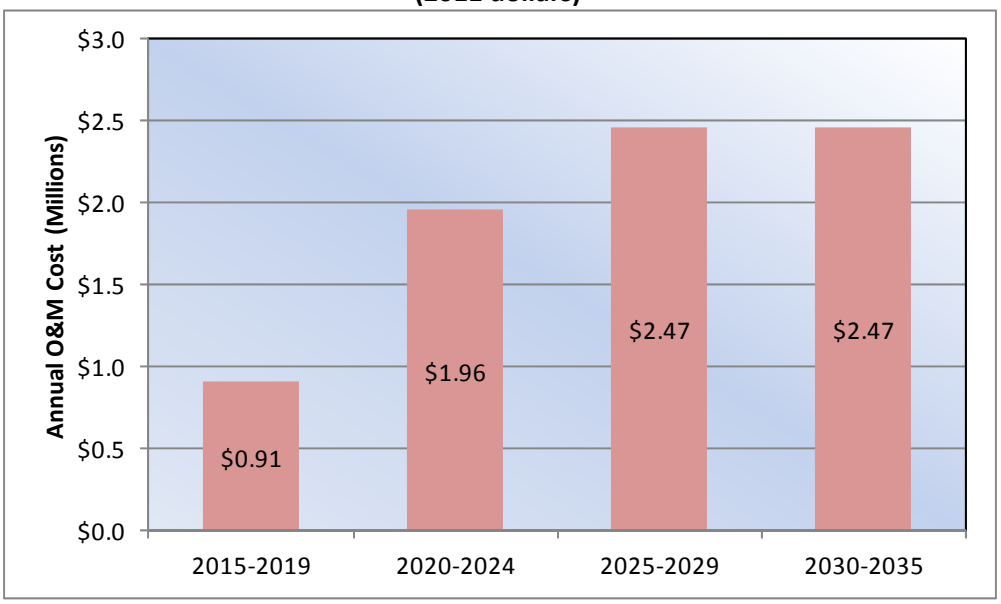


Table 3-4
Bus Needs Associated with Service Expansion Recommendations by Five-Year Increment

Geographic Area	Operator	Improvement Description	Est'd. Buses Required	2015	2020	2025	2030	2035
Fairfax County	Fairfax	Restructure Tysons service to stop at Saratoga pnr	0					
	Either	New: Saratoga-Pentagon Express - 5 a.m. and 5 p.m. trips	4	4				
	Spares		1	1				
	SubTotal		***5***	**5**	**0**	**0**	**0**	**0**
Prince William County	OmniRide	Replace 3 retired buses presently used for emerg. I-95 service	3	3				
	OmniRide	Lake-Ridge-Washington, D.C. - add 3 a.m. and 4 pm. trips	3			3		
	OmniRide	Lake Ridge-Pentagon/Crystal City - add 3 a.m. and 3 p.m. trips	3			3		
	OmniRide	New Service - Lake Ridge to Mark Center - 4 a.m. and 4 p.m. trips	3	3				
	OmniRide	Dale City/Potomac Mills-Washington, D.C. - add 4 a.m. and 5 p.m. trips	4		4			
	OmniRide	Dale City/Potomac Mills-Pentagon/Crystal City - add 3 a.m. and 4 p.m. trips	2			2		
	OmniRide	Dale City/Potomac Mills-Rosslyn/Balston - add 2 a.m. and 2 p.m. trips	2		2			
	OmniRide	New Service: Dale City/Potomac Mills-Mark Center - 4 a.m. and 4 p.m. trips	3	3				
	OmniRide	New Service: Dale City/Potomac Mills-Merrifield - 4 a.m. and 4 p.m. trips	4		4			
	OmniRide	Monclair/Dumfries-Pentagon/DC - Add 2 a.m. and 3 p.m. trips	2		2			
	OmniRide	New Service: Montclair/Dumfries-Tysons Corner - 4 a.m. and 4 p.m. trips	4		4			
	MetroDirect	Prince William MetroDirect - Increase peak period frequencies to 20-min.	1		1			
	Spares		7	2	3	2		
	SubTotal		***41***	**11**	**20**	**10**	**0**	**0**
TOTALS			**46**	**16**	**20**	**10**	**0**	**0**

Notes:

1. *Bus needs for improvements that are shaded reflect services that would use the I-95 HOT/HOV lanes.*
2. *Table reflects initial buses for proposed new service, and does not include any additional bus replacements.*

Table 3-5
Bus Service Expansion Recommendations - O&M Cost Estimates (2011 dollars)

Geographic Area	Imrpr. Status	Operator	Improvement Description	Annual O&M Cost	Potential Farebox	Net O&M Cost	Impl. Year	Total O&M thru 2035	Farebox thru 2035	Net Costs thru 2035
Fairfax	Committed Service	Fairfax	I-495 HOT Lane Service - Lorton-Tysons	Service Plans currently under development			< 2015		Committed Project	
County	Improvements	Fairfax	I-495 HOT Lane Service - Franconia/Springfield-Tysons	Service Plans currently under development			< 2015		Committed Project	
	Additional	Fairfax	Restructure Tysons service to stop at Saratoga pnr	$92,000	$28,000	$64,000	2015	$1,840,000	$560,000	$1,280,000
	Service Needs	Fairfax or	New: Saratoga-Pentagon Express - 5 a.m. and 5 p.m. trips	$230,000	$69,000	$161,000	2015	$4,600,000	$1,380,000	$3,220,000
	SubTotal			***$322,000***	***$97,000***	***$225,000***		***$6,440,000***	***$1,940,000***	***$4,500,000***
Prince William	Committed Service	OmniRide	Permanently operate additional OmniRide trips that were recently	$505,000	$227,000	$278,000	2015	$10,100,000	$4,540,000	$5,560,000
County	Improvements		implementd to address overcrowding issues							
	Additional	OmniRide	Lake-Ridge-Washington, D.C. - add 3 a.m. and 4 pm. trips	$321,000	$144,000	$177,000	2025	$3,210,000	$1,440,000	$1,770,000
	I-95 Corridor	OmniRide	Lake Ridge-Pentagon/Crystal City - add 3 a.m. and 3 p.m. trips	$275,000	$124,000	$151,000	2025	$2,750,000	$1,240,000	$1,510,000
	Service Needs	OmniRide	New Service - Lake Ridge to Mark Center - 4 a.m. and 4 p.m. trips	$367,000	$165,000	$202,000	2015	$7,340,000	$3,300,000	$4,040,000
		OmniRide	Dale City/Potomac Mills-Washington, D.C. - add 4 a.m. and 5 p.m. trips	$413,000	$186,000	$227,000	2020	$6,195,000	$2,790,000	$3,405,000
		OmniRide	Dale City/Potomac Mills-Pentagon/Crystal City - add 3 a.m. and 4 p.m. trips	$321,000	$144,000	$177,000	2025	$3,210,000	$1,440,000	$1,770,000
		OmniRide	Dale City/Potomac Mills-Rosslyn/Balston - add 2 a.m. and 2 p.m. trips	$184,000	$83,000	$101,000	2020	$2,760,000	$1,245,000	$1,515,000
		OmniRide	New Service: Dale City/Potomac Mills-Mark Center - 4 a.m. and 4 p.m. trips	$367,000	$165,000	$202,000	2015	$7,340,000	$3,300,000	$4,040,000
		OmniRide	New Service: Dale City/Potomac Mills-Merrifield - 4 a.m. and 4 p.m. trips	$367,000	$165,000	$202,000	2020	$5,505,000	$2,475,000	$3,030,000
		OmniRide	Monclair/Dumfries-Pentagon/DC - Add 2 a.m. and 3 p.m. trips	$230,000	$104,000	$126,000	2020	$3,450,000	$1,560,000	$1,890,000
		OmniRide	New Service: Montclair/Dumfries-Tysons Corner - 4 a.m. and 4 p.m. trips	$367,000	$165,000	$202,000	2020	$5,505,000	$2,475,000	$3,030,000
		MetroDirect	Prince William MetroDirect - Increase peak period frequencies to 20-min.	$245,000	$49,000	$196,000	2020	$3,675,000	$735,000	$2,940,000
	SubTotal			***$3,962,000***	***$1,721,000***	***$2,241,000***		***$61,040,000***	***$26,540,000***	***$34,500,000***
Stafford and	Additional	Private Op's.	Washington D.C. Service - add 6 trips each peak period	$551,000	$551,000	$0	2020	$8,265,000	$8,265,000	$0
Spotsylvania	I-95 Corridor	Private Op's.	Pentagon/Crystal City Service - add 2 trips each peak period	$184,000	$184,000	$0	2020	$2,760,000	$2,760,000	$0
Counties	Service Needs	Private Op's.	Mark Center Service - add 2 trips each peak period	$184,000	$184,000	$0	2020	$2,760,000	$2,760,000	$0
		Private Op's.	Navy Yard/DOT Service - add 1 trip each peak period	$92,000	$92,000	$0	2025	$920,000	$920,000	$0
		Private Op's.	Rosslyn Service - add 2 trips each peak period	$184,000	$184,000	$0	2025	$1,840,000	$1,840,000	$0
		Private Op's.	Fort Belvoir Service - add 1 trip each peak period	$92,000	$92,000	$0	2015	$1,840,000	$1,840,000	$0
		Private Op's.	Tysons Corner Service - new service, 2 trips each peak period	$184,000	$184,000	$0	2025	$1,840,000	$1,840,000	$0
	SubTotal			***$1,471,000***	***$1,471,000***	***$0***		***$20,225,000***	***$20,225,000***	***$0***
TOTALS				**$5,755,000**	**$3,289,000**	**$2,466,000**		**$87,705,000**	**$48,705,000**	**$39,000,000**

Notes:

1. *Costs in 2011 dollars*
2. *Costs based on a cost per revenue hour assumption of $120*
3. *Assumed farebox recovery ratios for each operator are as follows:*
   - *a. Local routes 20% Assuming 20% farebox recovery/80% subsidy*
   - *b. Fairfax express 30% Assuming 30% farebox recovery/70% subsidy*
   - *c. PRTC 45% Consistent with PRTC TDP assumptions*
   - *d. Stafford/Spotsy 100% Assumes 100% recovery under private operations*

3.4 Bus Service Expansion Capital Cost Estimates

Table 3-6 presents capital cost estimates associated with the additional bus purchases by five-year increment. A total of $23.4 million would be required to purchase peak buses and spares for the non-committed service improvements utilizing the I-95 HOT/HOV lanes (2011 dollars). The bus costs are based on a unit cost of $450,000 for Fairfax County and unit costs per the TDP for PRTC that range from $430,00 to $540,000, depending on the type of bus service. Note that these additional bus requirements do not take into account bus life cycles and bus replacement costs over the plan's time period. Bus purchase costs are also presented in Year of Expenditure dollars in Appendix A.

Table 3-6
Capital Costs for Bus Needs Associated with Service Expansion Recommendations (2011 dollars)

Geographic Area	Operator	Improvement Description	Capital Costs	2015	2020	2025	2030	2035
Fairfax County	WMATA	Route 18 G/H/J/P Restructuring	n/a					
	Fairfax	Restructure Tysons service to stop at Saratoga pnr	$0					
	Either	New: Saratoga-Pentagon Express - 5 a.m. and 5 p.m. trips	$1,800,000	$1,800,000				
	Spares		$450,000	$450,000				
	SubTotal		***$2,250,000***	***$2,250,000***	***$0***	***$0***	***$0***	***$0***
Prince William County	OmniRide	Replace 3 retired buses presently used for emerg. I-95 service	$1,620,000	$1,620,000				
	OmniRide	Lake-Ridge-Washington, D.C. - add 3 a.m. and 4 pm. trips	$1,620,000			$1,620,000		
	OmniRide	Lake Ridge-Pentagon/Crystal City - add 3 a.m. and 3 p.m. trips	$1,620,000			$1,620,000		
	OmniRide	New Service - Lake Ridge to Mark Center - 4 a.m. and 4 p.m. trips	$1,290,000	$1,290,000				
	OmniRide	Dale City/Potomac Mills-Washington, D.C. - add 4 a.m. and 5 p.m. trips	$2,160,000		$2,160,000			
	OmniRide	Dale City/Potomac Mills-Pentagon/Crystal City - add 3 a.m. and 4 p.m. trips	$1,080,000			$1,080,000		
	OmniRide	Dale City/Potomac Mills-Rosslyn/Balston - add 2 a.m. and 2 p.m. trips	$1,080,000		$1,080,000			
	OmniRide	New Service: Dale City/Potomac Mills-Mark Center - 4 a.m. and 4 p.m. trips	$1,290,000	$1,290,000				
	OmniRide	New Service: Dale City/Potomac Mills-Merrifield - 4 a.m. and 4 p.m. trips	$2,160,000		$2,160,000			
	OmniRide	Monclair/Dumfries-Pentagon/DC - Add 2 a.m. and 3 p.m. trips	$1,080,000		$1,080,000			
	OmniRide	New Service: Montclair/Dumfries-Tysons Corner - 4 a.m. and 4 p.m. trips	$2,160,000		$2,160,000			
	MetroDirect	Prince William MetroDirect - Increase peak period frequencies to 20-min.	$430,000		$430,000			
	Spares		$3,560,000	$1,017,000	$1,526,000	$1,017,000		
	SubTotal		***$21,150,000***	***$5,217,000***	***$10,596,000***	***$5,337,000***	***$0***	***$0***
TOTALS			**$23,400,000**	**$7,467,000**	**$10,596,000**	**$5,337,000**	**$0**	**$0**

Notes:

1. *Table reflects initial buses for proposed new service, and does not include any additional bus replacements.*
2. *PRTC bus unit capital costs consistent with those used in the PRTC TDP.*
3. *Fairfax County bus unit costs assume an average of $450,000 per bus (standard coach).*

4.0 Transportation Demand Management Program Recommendations

As discussed in *Technical Memorandum #2*, the transportation demand management (TDM) needs from the prior *I-95/I-395 Transit and TDM Study* have been revisited and refined in light of new programs, updated plans for existing programs and discussions with corridor TDM staff. The identified TDM needs can be categorized as follows:

- Vanpool Program Assistance
    - VanStart/VanSave
    - Vanpool Insurance
    - NTD Program
- Telework Program Assistance
- I-95 Corridor Marketing/Education
    - Annual Marketing Campaigns
    - HOT/HOV Start-up Campaigns
- TDM Program Staffing
- Technology Upgrades
- Supporting Programs
    - Guaranteed Ride Home
    - Incentive Programs

Currently, Transportation Efficiency Improvement Fund (TEIF) monies are utilized to fund the local TDM programs. No additional funding is available to implement these recommendations. The TDM recommendations detailed in *Technical Memorandum #2* will be implemented to the extent possible using any unobligated TEIF funds that remain at the end of each fiscal year or any other funding that becomes available. Since available funding will vary from year to year, it is not possible to determine the timeframe or extent of implementation of these recommendations.

5.0 Destination End Facility Recommendations

As discussed in *Technical Memorandum #2*, it is important not to lose sight of potential infrastructure impacts and needs at I-95 commuter trip destinations both south and north of I-495. Within the I-95 corridor, the assessment revealed the destination end facility needs as summarized below.

Mark Center

Although technically not within the I-95 Corridor, this facility has been included because it is located just north of the defined corridor, and is anticipated to be a major travel destination for trips from the corridor. As noted in Technical Memorandum #1, actions taken through the 2005 Base Realignment and Closure (BRAC) Act are resulting in 6,400 additional military personnel at the Mark Center. A Transportation Management Plan was prepared that includes actions intended to reduce single occupant vehicle trips to/from the Mark Center. To encourage transit usage, a transit center has been constructed within the Mark Center that includes five bus bays. WMATA and DASH already have plans in place to serve the Mark Center (discussed in *Technical Memorandum #2*). Potential service expansion plans presented in this study will increase commuter bus trips to/from the Mark Center, with those bus trips being able to utilize the planned I-95 HOV ramp to/from Seminary Road. A review of proposed bus service levels indicate that there should be sufficient capacity to accommodate commuter bus service expansion, as proposed in this study. However, there is little room for further expansion of bus service, and bus operations at the transit center will need to be carefully managed.

Franconia-Springfield Metrorail Station

There are presently eight bays at Franconia-Springfield Metrorail station, with these bays utilized by Metrobus, Fairfax Connector and PRTC. The Department of Defense will also be operating shuttle service from this station to the Mark Center and Fort Belvoir North. WMATA staff is presently in the planning process for adding two or three bays at this station through a TIGER Grant. Potential service expansion plans presented in this study will increase PRTC and possibly commuter bus trips to/from this station. A review of proposed bus service levels indicate that there should be sufficient capacity to accommodate bus service expansion at this station, as proposed in this study. However, coordination will still be needed in the assignment of bus service to bus bays at this station, for there are also planned service increases at this station by the Fairfax Connector and by DoD shuttles.

There are also over 5,100 on-site parking spaces that are fully-utilized. There are no travel demand forecasts available to determine potential additional parking demands at this station. However, concern has been expressed by stakeholders about potential increased demands from Single Occupant Vehicle (SOV) commuters that might exit the HOT lanes on I-95 and complete their trip via the Blue Line (since the HOT lanes will end north of I-495 and there is a reduction from 3 to 2 HOV lanes). To address this need, a strategy has been identified to expand off-site parking and provide shuttle service between the off-site parking and the Franconia-Springfield Station. For purposes of this study, 750 off-site spaces have been assumed as structured parking. Specific demand will need to be determined through further analysis with the regional travel demand model. **Table 6-1** presents estimated costs (capital and O&M) associated with this strategy.

As was noted for the non-rail park-and-ride space recommendations, it is important that there be flexibility for local jurisdictions and VDOT to work together to identify an appropriate location for these

proposed off-site spaces. These spaces could be combined with other park-and-ride space recommendations presented earlier in this Technical Memorandum. Shuttle bus service for the off-site parking must also be coordinated with existing local bus service in the Springfield area.

Costs for the proposed 750 off-site parking spaces total $22.5 million, based on a typical unit cost of $30,000 per structured parking space. This would be a one-time capital cost with implementation assumed in 2020 (ideally should be coordinated with completion of the I-95 HOT/HOV lane project into Spotsylvania County). Note that this cost estimate does not include annual maintenance costs of the parking structure. Shuttle service would be implemented once the new off-site parking facility is opened, and has been estimated at an annual cost of $551,000. Three buses are proposed for the service (2 in operation, one spare), adding an additional capital cost of $1.35 million. Thus, the total cost of the parking expansion from 2020 through 2035 would be $32.115 million (2011 dollars). Franconia-Springfield off-site parking-and-ride costs (for the parking structure and shuttle service) are also presented in Year of Expenditure dollars in Appendix A.

Table 6-1
Franconia-Springfield Off-Site Parking Recommendations - Estimated Costs (in 2011 dollars)

Location	Improvement Description	Impl. Year	Project Cost
Franconia-Springfield Metrorail	Add off-site parking - 750 spaces	2020	$22,500,000
	Shuttle Service to off-site parking (2 vehicles, 9 hours/day - 255 days/year)	Annual cost Cost thru 2035	$551,000 $8,265,000
	Shuttle Buses - 3 buses (2 peak/1 spare) @ $450,000 each	2020	$1,350,000
TOTALS			**$32,115,000**

Notes:

1. *Cost for off-site parking is based on $30,000 per parking space, reflecting a typical parking structure unit cost*
2. *Shuttle operation cost based on a unit cost of $120 per revenue hour*

6.0 Summary of Costs

This final section presents summaries of the costs detailed in the prior sections of this technical memorandum. **Table 7-1** presents an overall plan summary matrix, breaking down the costs by plan element (i.e., capital costs, O&M costs, TDM costs and Franconia-Springfield Station costs). It further breaks down costs by funding commitment status. Costs presented in this table are for the plan's entire time period (through 2035).

Table 7-1
Summary of Estimated Costs for Plan Recommendations (2011 dollars)

Plan Element	Plan Cost
Capital Costs	
Current Funded Park & Ride Spaces	$22,800,000
Additional Park & Ride Spaces	$98,875,000
Bus Fleet Expansion	$23,400,000
O&M Costs (thru 2035)	$39,000,000
TDM Program Costs (thru 2035)	TBD
Franconia Springfield Station	
Off-Site Parking	$22,500,000
Off-Site Parking Shuttle Buses & O&M	$9,615,000
Total Costs	**$216,190,000**
Previoiusly Committed Funds:	***$22,800,000***
Recommended for Six-Year Program	***$193,390,000***

Table 7-2 focuses only on costs recommended for inclusion in the State's Six-Year Program by plan element and five-year increment for I-95 related costs. Total costs by plan element and by time period are also illustrated in **Figure 7-1** and **Figure 7-2.**

The total cost (capital and O&M) is estimated to be $193.39 million between 2015 and 2035. By time period, total costs increase significantly from the 2015-2019 period to the 2020-2024 period and then taper off somewhat in the last two time periods. The expansion of park-and-ride spaces along I-95 is by far the largest component of the recommendations, at $98.9 million (or 51%). A summary table of plan costs is also presented in Year of Expenditure dollars in Appendix A.

Table 7-2
Summary of Recommended Funding by Plan Element and Time Period (2011 dollars)

Plan Element	Time Period 2015-19	2020-24	2024-2029	2030-2035	TOTAL
Total Corridor Service/Project Needs					
Previously Funded P&R Spaces	$22,800,000	$0	$0	$0	$22,800,000
Additional P&R Spaces	$0	$35,875,000	$27,937,500	$35,062,500	$98,875,000
Bus Purchase Needs	$7,467,000	$10,596,000	$5,337,000	$0	$23,400,000
Add'l. Bus O&M (Net)	$4,535,000	$9,805,000	$12,330,000	$12,330,000	$39,000,000
TDM Programs	TBD	TBD	TBD	TBD	TBD
F-S Station Off-Site Parking	$0	$22,500,000	$0	$0	$22,500,000
F-S Station Parking/Shuttle & Buses	$0	$4,105,000	$2,755,000	$2,755,000	$9,615,000
Total (Funded and Recommended)	**$34,802,000**	**$82,881,000**	**$48,359,500**	**$50,147,500**	**$216,190,000**
Total for Six-Year Program:	**$12,002,000**	**$82,881,000**	**$48,359,500**	**$50,147,500**	**$193,390,000**

Figure 7-1
Summary of Recommended Funding by Plan Element (2011 dollars)

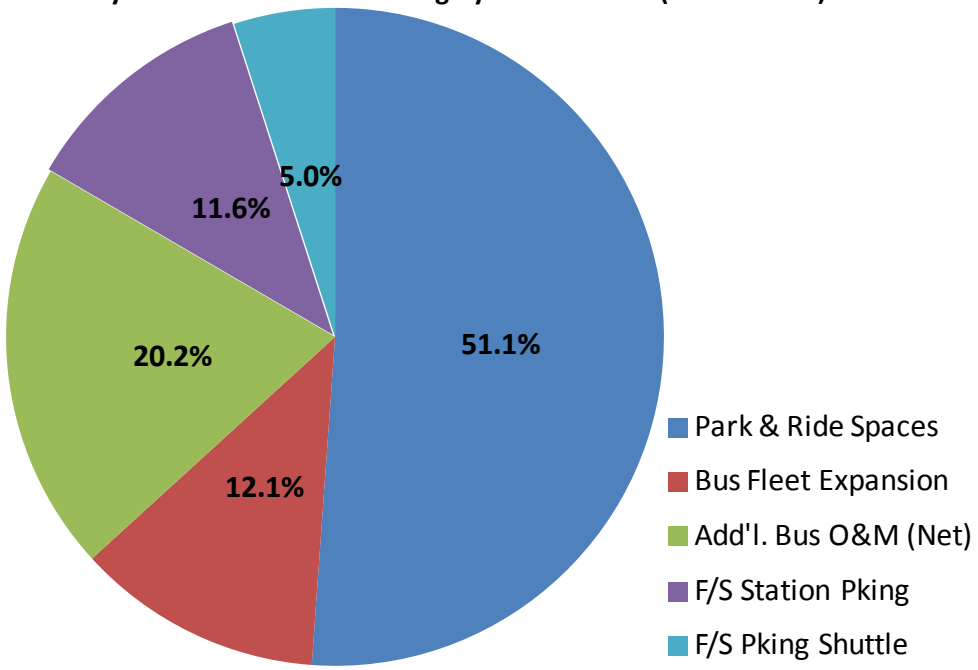
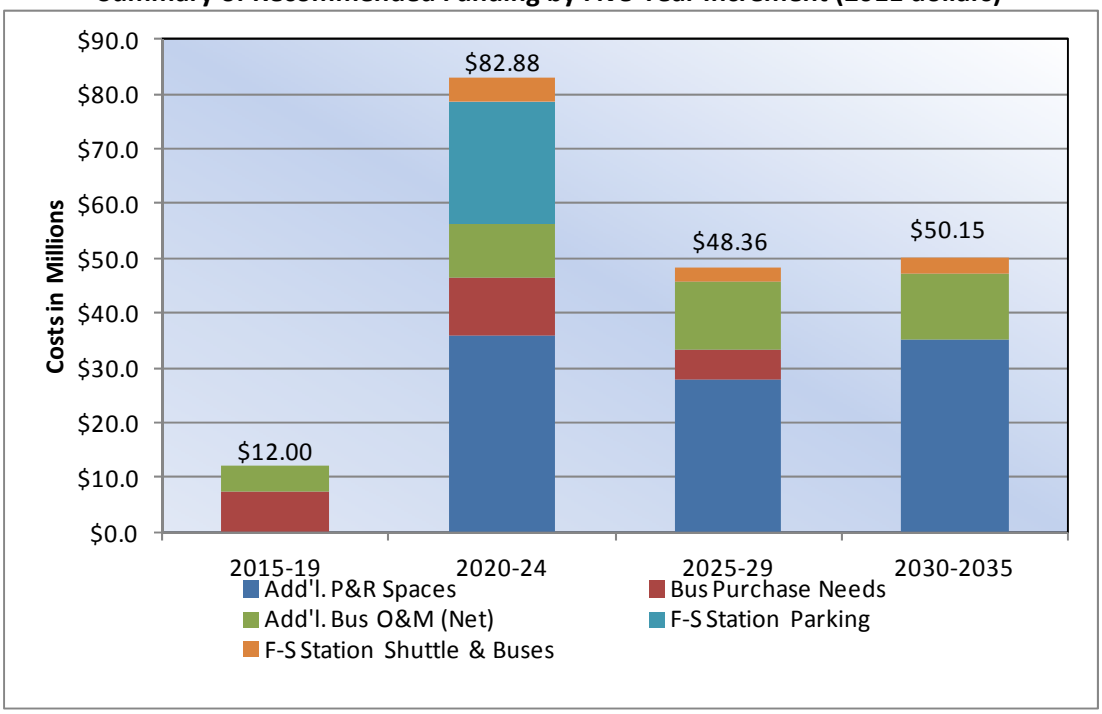


Figure 7-2
Summary of Recommended Funding by Five-Year Increment (2011 dollars)



APPENDIX A
I-95 TRANSIT AND TDM RECOMMENDATIONS: COST TABLES IN YEAR OF EXPENDITURE DOLLARS

I-95 CORRIDOR TRANSIT & TDM NEEDS PLAN
SUMMARY OF COSTS FOR PLAN ELEMENTS

Plan Summary

Plan Element	Plan Cost
Capital Costs	
Current Funded Park & Ride Spaces	$22,800,000
Additional Park & Ride Spaces	$150,550,000
Bus Fleet Expansion	$30,300,000
O&M Costs	$56,859,000
TDM Program Costs (thru 2035)	TBD
Franconia Springfield Station	
Off-Site Parking	$29,357,000
Off-Site Parking Shuttle Buses & O&M	$15,132,000
Total Costs	**$304,998,000**
Funded Costs	***$22,800,000***
Unfunded Costs	***$282,198,000***

Costs in year of expenditure dollars.

Capital Costs

	Scenario A Costs (YOE Dollars)		
Plan Element	Total Cost	Funds Committed	Additional Recommended
Park & Ride Spaces (6,275 spaces)	$173,350,000	$22,800,000	$150,550,000
Bus Fleet Expansion	$30,300,000	$0	$30,300,000
Franconia-Springfield Off-Site Parking	$29,357,000	$0	$29,357,000
Franconia-Springfield Shuttle Buses	$1,761,000	$0	$1,761,000
TOTALS	**$234,768,000**	**$22,800,000**	**$211,968,000**

Costs in year of expenditure dollars.

O&M Costs

	Costs in 2011 dollars			*YOE dollars*
Service	Annual O&M Cost	Potential Farebox	Net O&M Cost	Net O&M Over 20 yrs.
Bus Service Costs	$5,250,000	$3,062,000	$2,188,000	$56,859,000
Franconia-Springfield Parking Shuttle	$551,000	$0	$551,000	$13,371,000

Costs in year of expenditure dollars.

I-95 CORRIDOR TRANSIT & TDM NEEDS PLAN
CAPITAL COST ESTIMATES FOR PARK & RIDE SPACES

Costs in Year of Expenditure Dollars

Geographic Area	Improvement Description	Number of Parking Spaces	Cost/Space	Total Cost	Funding Committed	Remaining Amont	< 2015	2015-2019	2020-2024	2025-2029	2030-2035	Total
Fairfax District	Saratoga Lot* (2013)	600	$5,000	$3,000,000	$3,000,000		$3,000,000					**$3,000,000**
	Additional Needs	250	$15,000	$3,750,000		$3,750,000			$4,893,000			**$4,893,000**
Prince William District 1	Additional Needs	1,100	$15,000	$16,500,000		$16,500,000				$12,479,000	$14,466,000	**$26,945,000**
Prince William District 2	Telegraph Rd* (2012)	700	$11,429	$8,000,000	$8,000,000		$8,000,000					**$8,000,000**
	Additional Needs (Horner Road Expansion)	950	$20,000	$19,000,000		$19,000,000			$24,791,000			**$24,791,000**
Prince William District 3	Additional Needs	400	$15,000	$6,000,000		$6,000,000			$7,829,000			**$7,829,000**
Stafford District 1	Staffordborough Rd. Lot Expansion* (2015)	1,000	$5,900	$5,900,000	$5,900,000			$5,900,000				**$5,900,000**
	Additional Needs	1,300	$15,000	$19,500,000		$19,500,000				$14,748,000	$17,097,000	**$31,845,000**
Stafford District 2	Additional Needs	950	$15,000	$14,250,000		$14,250,000			$9,297,000		$12,494,000	**$21,791,000**
Fredericksburg &	Route 3 (2017)*	1,000	$5,900	$5,900,000	$5,900,000			$5,900,000				**$5,900,000**
Spotsylvania District	Additional Needs	1,325	$15,000	$19,875,000		$19,875,000				$15,031,000	$17,425,000	**$32,456,000**
TOTALS		**9,575**		**$121,675,000**	**$22,800,000**	**$98,875,000**	**$11,000,000**	**$11,800,000**	**$46,810,000**	**$42,258,000**	**$61,482,000**	**$173,350,000**
Previously Committed Funds:							*$11,000,000*	*$11,800,000*	*$0*	*$0*	*$0*	*$22,800,000*
Additional Recommended Funding:							*$0*	*$0*	*$46,810,000*	*$42,258,000*	*$61,482,000*	*$150,550,000*

Notes:

1. Lots with (*) are already programmed for construction by VDOT staff. Cost per space derived by dividing VDOT-supplied total cost into planned # of spaces.
2. Capital costs for the Route 3 pnr lot are assumed to be similar to cost identified for Staffordborough lot expansion.
3. Costs for Additional Needs for Prince William District #2 (Horner Road Expansion) suggested by VDOT staff.
4. For all other spaces, $15,000 per parking space was recommended for use by VDOT staff, to account for construction, ROW acquisition and site access improvement costs.
5. Annual Inflation Factor = 3%
6. Costs for committed park & ride projects were not inflated.

I-95 CORRIDOR TRANSIT & TDM NEEDS PLAN
ANNUAL O&M COST ESTIMATES FOR BUS SERVICE

Costs in Year of Expenditure Dollars

Geographic Area	Imrpr. Status	Operator	Improvement Description	Annual O&M Cost	Potential Farebox	Net O&M Cost	Impl. Year	Total O&M thru 2035	Farebox thru 2035	Net Costs thru 2035
Fairfax County	Committed Service Improvements	Fairfax	I-495 HOT Lane Service - Lorton-Tysons	Service Plans currently under development			< 2015		Committed Project	
		Fairfax	I-495 HOT Lane Service - Franconia/Springfield-Tysons	Service Plans currently under development			< 2015		Committed Project	
	Additional Service Needs	Fairfax	Restructure Tysons service to stop at Saratoga pnr	$92,000	$28,000	$64,000	2015	$2,782,000	$847,000	$1,935,000
		Fairfax or	New: Saratoga-Pentagon Express - 5 a.m. and 5 p.m. trips	$230,000	$69,000	$161,000	2015	$6,956,000	$2,087,000	$4,869,000
	SubTotal			***$322,000***	***$97,000***	***$225,000***		***$9,738,000***	***$2,934,000***	***$6,804,000***
Prince William County	Committed Service Improvements	OmniRide	Permanently operate additional OmniRide trips that were recently implementd to address overcrowding issues	$505,000	$227,000	$278,000	2015	$15,273,000	$6,865,000	$8,408,000
	Additional I-95 Corridor Service Needs	OmniRide	Lake-Ridge-Washington, D.C. - add 3 a.m. and 4 pm. trips	$321,000	$144,000	$177,000	2025	$5,566,000	$2,497,000	$3,069,000
		OmniRide	Lake Ridge-Pentagon/Crystal City - add 3 a.m. and 3 p.m. trips	$275,000	$124,000	$151,000	2025	$4,769,000	$2,150,000	$2,619,000
		OmniRide	New Service - Lake Ridge to Mark Center - 4 a.m. and 4 p.m. trips	$367,000	$165,000	$202,000	2015	$11,099,000	$4,990,000	$6,109,000
		OmniRide	Dale City/Potomac Mills-Washington, D.C. - add 4 a.m. and 5 p.m. trips	$413,000	$186,000	$227,000	2020	$10,022,000	$4,514,000	$5,508,000
		OmniRide	Dale City/Potomac Mills-Pentagon/Crystal City - add 3 a.m. and 4 p.m. trips	$321,000	$144,000	$177,000	2025	$5,566,000	$2,497,000	$3,069,000
		OmniRide	Dale City/Potomac Mills-Rosslyn/Balston - add 2 a.m. and 2 p.m. trips	$184,000	$83,000	$101,000	2020	$4,465,000	$2,014,000	$2,451,000
		OmniRide	New Service: Dale City/Potomac Mills-Mark Center - 4 a.m. and 4 p.m. trips	$367,000	$165,000	$202,000	2015	$11,099,000	$4,990,000	$6,109,000
		OmniRide	New Service: Dale City/Potomac Mills-Merrifield - 4 a.m. and 4 p.m. trips	$367,000	$165,000	$202,000	2020	$8,906,000	$4,004,000	$4,902,000
		OmniRide	Monclair/Dumfries-Pentagon/DC - Add 2 a.m. and 3 p.m. trips	$230,000	$104,000	$126,000	2030	$2,141,000	$968,000	$1,173,000
		OmniRide	New Service: Montclair/Dumfries-Tysons Corner - 4 a.m. and 4 p.m. trips	$367,000	$165,000	$202,000	2030	$3,417,000	$1,536,000	$1,881,000
		MetroDirect	Prince William MetroDirect - Increase peak period frequencies to 20-min.	$245,000	$49,000	$196,000	2020	$5,946,000	$1,189,000	$4,757,000
	SubTotal			***$3,962,000***	***$1,721,000***	***$2,241,000***		***$88,269,000***	***$38,214,000***	***$50,055,000***
Stafford and Spotsylvania Counties	Additional I-95 Corridor Service Needs	Private Op's.	Washington D.C. Service - add 6 trips each peak period	$551,000	$551,000	$0	2020	$13,371,000	$13,371,000	$0
		Private Op's.	Pentagon/Crystal City Service - add 2 trips each peak period	$184,000	$184,000	$0	2020	$4,465,000	$4,465,000	$0
		Private Op's.	Mark Center Service - add 2 trips each peak period	$184,000	$184,000	$0	2020	$4,465,000	$4,465,000	$0
		Private Op's.	Navy Yard/DOT Service - add 1 trip each peak period	$92,000	$92,000	$0	2025	$1,595,000	$1,595,000	$0
		Private Op's.	Rosslyn Service - add 2 trips each peak period	$184,000	$184,000	$0	2025	$3,191,000	$3,191,000	$0
		Private Op's.	Fort Belvoir Service - add 1 trip each peak period	$92,000	$92,000	$0	2015	$2,782,000	$2,782,000	$0
		Private Op's.	Tysons Corner Service - new service, 2 trips each peak period	$184,000	$184,000	$0	2025	$3,191,000	$3,191,000	$0
	SubTotal			***$1,471,000***	***$1,471,000***	***$0***		***$33,060,000***	***$33,060,000***	***$0***
TOTALS				**$5,755,000**	**$3,289,000**	**$2,466,000**		**$131,067,000**	**$74,208,000**	**$56,859,000**

Annual inflation factor = *3%*

Weekdays per Year: 255

Cost per Hour Assumptions

USE $120.00

Farebox Recovery Ratios

Locals	20%	Assuming 20% farebox recovery/80% subsidy
Fairfax Express	30%	Assuming 30% farebox recovery/70% subsidy
PRTC	45%	Consistent with PRTC TDP assumptions
Stafford/Spotsy	100%	Assume 100% recovery under private operations

I-95 CORRIDOR TRANSIT & TDM NEEDS PLAN

BUS CAPITAL COST ESTIMATES FOR BUS SERVICE

Costs in Year of Expenditure Dollars

Geographic Area	Operator	Improvement Description	Capital Costs	2015	2020	2025	2030	2035	Total Costs
Fairfax County	WMATA	Route 18 G/H/J/P Restructuring	n/a						
	Fairfax	Restructure Tysons service to stop at Saratoga pnr	$0						$0
	Either	New: Saratoga-Pentagon Express - 5 a.m. and 5 p.m. trips	$1,800,000	$2,026,000					$2,026,000
	Spares		$450,000	$506,000					$506,000
	SubTotal		***$2,250,000***	***$2,532,000***	***$0***	***$0***	***$0***	***$0***	***$2,532,000***
Prince William County	OmniRide	Replace 3 retired buses presently used for emerg. I-95 service	$1,620,000	$1,823,000					$1,823,000
	OmniRide	Lake-Ridge-Washington, D.C. - add 3 a.m. and 4 pm. trips	$1,620,000			$2,450,000			$2,450,000
	OmniRide	Lake Ridge-Pentagon/Crystal City - add 3 a.m. and 3 p.m. trips	$1,620,000			$2,450,000			$2,450,000
	OmniRide	New Service - Lake Ridge to Mark Center - 4 a.m. and 4 p.m. trips	$1,290,000	$1,452,000					$1,452,000
	OmniRide	Dale City/Potomac Mills-Washington, D.C. - add 4 a.m. and 5 p.m. trips	$2,160,000		$2,818,000				$2,818,000
	OmniRide	Dale City/Potomac Mills-Pentagon/Crystal City - add 3 a.m. and 4 p.m. trips	$1,080,000			$1,634,000			$1,634,000
	OmniRide	Dale City/Potomac Mills-Rosslyn/Balston - add 2 a.m. and 2 p.m. trips	$1,080,000		$1,409,000				$1,409,000
	OmniRide	New Service: Dale City/Potomac Mills-Mark Center - 4 a.m. and 4 p.m. trips	$1,290,000	$1,452,000					$1,452,000
	OmniRide	New Service: Dale City/Potomac Mills-Merrifield - 4 a.m. and 4 p.m. trips	$2,160,000		$2,818,000				$2,818,000
	OmniRide	Monclair/Dumfries-Pentagon/DC - Add 2 a.m. and 3 p.m. trips	$1,080,000		$1,409,000				$1,409,000
	OmniRide	New Service: Montclair/Dumfries-Tysons Corner - 4 a.m. and 4 p.m. trips	$2,160,000		$2,818,000				$2,818,000
	MetroDirect	Prince William MetroDirect - Increase peak period frequencies to 20-min.	$430,000		$561,000				$561,000
	Spares		$3,560,000	$1,145,000	$1,991,000	$1,538,000			$4,674,000
	SubTotal		***$21,150,000***	***$5,872,000***	***$13,824,000***	***$8,072,000***	***$0***	***$0***	***$27,768,000***
TOTALS			**$23,400,000**	**$8,404,000**	**$13,824,000**	**$8,072,000**	**$0**	**$0**	**$30,300,000**

Notes:

1. PRTC bus unit capital costs consistent with those used in the PRTC TDP.
2. Fairfax County bus unit costs assume average of $450k/bus (standard coach).
3. Costs for Commuter Coaches for S. Corridor not included because of assumptio nof continued private operations.
4. Table reflects initial costs of buses for proposed new service, and does not include any additional bus replacement costs.
5. Annual inflation factor = 3%

I-95 CORRIDOR TRANSIT & TDM NEEDS PLAN
COST ESTIMATES FOR FRANCONIA-SPRINGFIELD OFF-SITE PARKING EXPANSION AND SHUTTLE SERVICE

Costs in Year of Exp. $

Location	Improvement Description	Impl. Year	Project Cost
Franconia-Springfield Metrorail	Add off-site parking - 750 spaces	2020	$29,357,000
	Shuttle Service to off-site parking	Annual cost	$551,000
	(2 vehicles, 9 hours/day - 255 days/year)	Cost thru 2035	$13,371,000
	Shuttle Buses - 3 buses (2 peak/1 spare) @ $450,000 each	2020	$1,761,000
TOTALS			**$44,489,000**

Notes:

1. Cost for off-site parking based on $30,000 per parking space and reflects typical parking structure unit cost.
2. Other Needed Regional Facility Needs that are outside of I-95 corridor include:
   a. Pentagon Station bus bays and bus access improvements
   b. Crystal City transit center
   c. Managed bus loading/unloading areas in D.C. and Arlington
3. Annual inflation factor = 3%