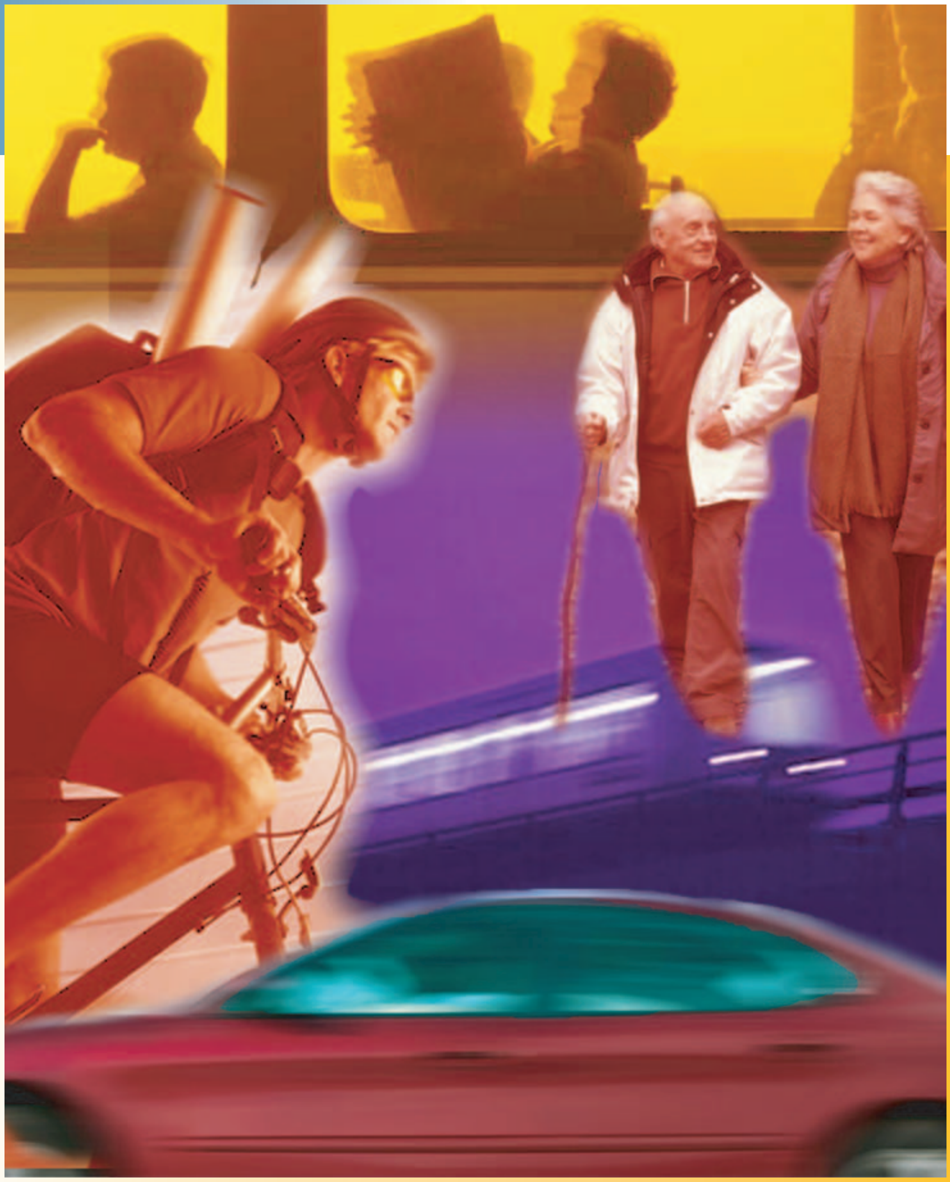
TransAction2030

Transportation for Today and Tomorrow



Northern Virginia 2030 Transportation Plan

Northern Virginia Transportation Authority

April 2006 Draft Plan

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Overview of the TransAction 2030 Plan Study

1.1 Study Background

In 2002, the Virginia General Assembly created the Northern Virginia Transportation Authority (NVTA) and charged it with developing a long-range regional transportation plan for Northern Virginia. NVTA recommends to the Commonwealth Transportaiton Board (CTB) which transportation projects should receive funding. The Authority is comprised of 17 members; nine are mayors or chairs, or their designees, of the nine cities and counties that are members of the Authority; two are members of the House of Delegates; one is a State Senator; and two are citizens appointed by the Governor. In addition, the Director of Virginia's Department of Rail and Public Transportation and the Commonwealth Transportation Commissioner, or designee, serve as non-voting members. Northern Virginia consists of the Counties of Arlington, Fairfax, Loudoun and Prince William. The Cities of Alexandria, Fairfax, Falls Church, Manassas and Manassas Park; and the Towns of Dumfries, Herndon, Leesburg, Purcellville and Vienna. This study effort, TransAction 2030, was initiated in the fall of 2004.

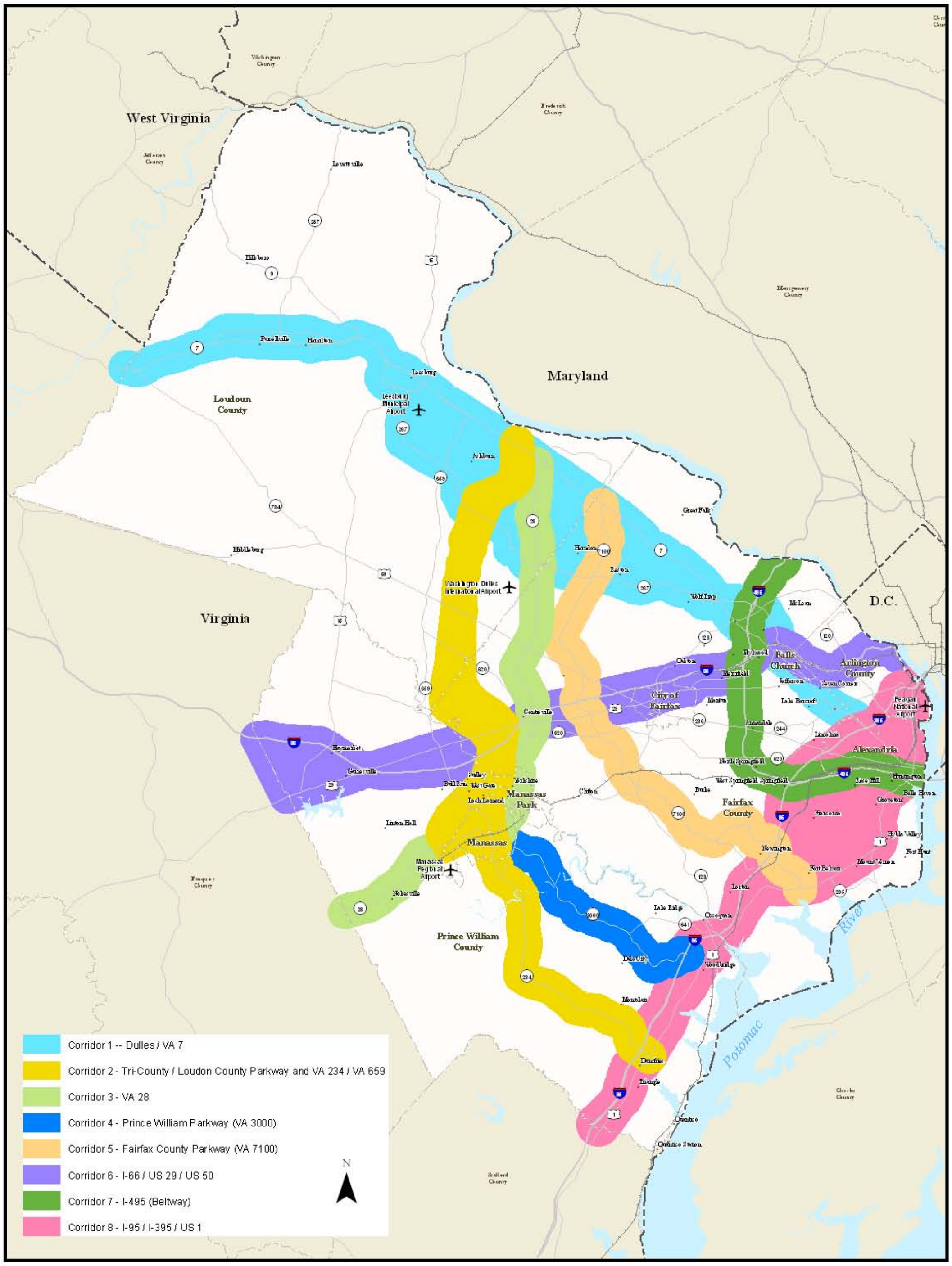
The Northern Virginia Transportation Commission (NVTC) was chosen to administer the contract for the NVTA. A Subcommittee of the NVTA Interim Technical Committee was formed to monitor and guide the study process. This Subcommittee was comprised of staff representing Northern Virginia jurisdictions and regional transportation agencies operating in Northern Virginia. The Subcommittee convened regularly throughout the study and reviewed technical material, provided direction to the consultant team and reported back to their respective agencies.

The TransAction 2030 study effort used as a basis the Northern Virginia 2020 Transportation Plan that was produced by the Virginia Department of Transportation (VDOT) under the auspices of Transportation Coordinating Council (TCC) in 1999. That study identified the eight major corridors throughout Northern Virginia, which are shown in Figure 1, and evaluated a comprehensive range of highway, high occupant vehicle (HOV), transit and trail projects to address existing and forecast system deficiencies.

The TransAction 2030 study is an update of the previous 2020 Transportation Plan in the following respects:

- 2030 is the target year
- Metropolitan Washington Council of Government's (MWCOG) Round 6.4a regional land use forecasts were used
- MWCOG's 2004 Constrained Long Range Plan (CLRP) travel demand model was used to analyze future years
- 2020 Transportation Plan project lists were updated to reflect projects that had been completed or added to the region's CLRP
- No new transportation projects beyond those identified in the 2020 Transportation Plan were evaluated
- Cost estimates for TransAction 2030 projects were updated to 2005 dollars and revised based on currently-available studies and information
- A project prioritization procedure was developed and applied to help decision-makers prioritize TransAction 2030 projects
- Transit system level of service (LOS) was explicitly determined
- A state-of-the-art Multimodal Corridor LOS procedure was applied to evaluate the eight multimodal corridors in Northern Virginia
- A scientific telephone survey was conducted to provide data on the concerns and priorities of Northern Virginia's citizens

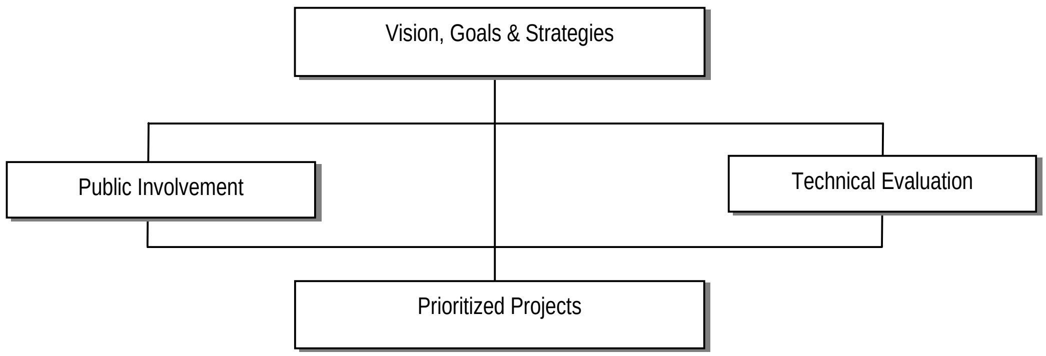
Figure 1 Northern Virginia Transportation Corridors



1.2 TransAction 2030 Plan Process

The overall TransAction 2030 Plan process is shown schematically in Figure 2.

Figure 2 TransAction 2030 Plan Process



The vision, goals and strategies adopted by the TCC in 1999 for the 2020 Transportation Plan were used as the basis for the TransAction 2030 Plan. The planning process applied current state-of-the-art technical analysis procedures, and a comprehensive public involvement program, including a scientific household telephone survey to develop a final set of prioritized projects. The NVTA approved the TransAction 2030 Plan in March 2006.

Vision, Goals and Strategies

The TCC's adopted vision states:

"In the 21st century, Northern Virginia will develop and sustain a multimodal transportation system that supports our economy and quality of life. It will be fiscally sustainable, promote areas of concentrated growth, manage both demand and capacity, and employ the best technology, joining rail, roadway, bus, air, water, pedestrian, and bicycle facilities into an interconnected network."

The goals developed for the TransAction 2030 Plan build on goals of the 2020 Transportation Plan and earlier plans in Northern Virginia and the Metropolitan Washington region. These include:

- Provide an integrated, multimodal transportation system
- Provide responsive transportation service to customers
- Respect historical and environmental factors

- Recognize the linkage between transportation and land use
- Incorporate the benefits of technology
- Identify funding and legislative initiatives needed to implement the Plan
- Enhance Northern Virginia relationships among jurisdictions, agencies, the public and the business community

Strategies that have been evaluated to attain these goals include:

- Improve connections between modes
- Increase person movement capacity of highway and transit modes
- Increase deployment and application of Intelligent Transportation Systems (ITS)
- Improve connectivity of the regional bicycle and pedestrian trail system
- Incorporate pedestrian and bicycle improvements into roadway improvement projects
- Improve connections to and from activity centers for all modes and populations
- Maintain the existing system for maximum performance

Public Involvement

Thousands of Northern Virginia's citizens participated in the TransAction 2030 planning process. This participation focused on developing a regional consensus on transportation system improvement priorities. Citizens participated in seven community events where they prioritized investments using ballots. An interactive website provided online activities and a project presentation. A project newsletter reached over three thousand residents and E-mail broadcasts at major study milestones were sent to over eleven hundred community leaders. Finally, a formal public hearing and open house was held to share the results of the study and receive additional input. Results of the various public involvement activities will be described in Section 4.4 of this document.

As part of the public involvement program, the NVTA directed that a household telephone survey be conducted to gauge citizen input on transportation priorities and potential funding mechanisms. Further, they wanted this survey to be accurate at the jurisdiction level. A survey consultant was commissioned to conduct this survey and a total of 1,263 Northern Virginia adults over the age of eighteen were completed. A detailed description of the survey results is provided in Section 5.2 of this document. A summary of the key findings includes:

- The public supported multimodal solutions
- Those who chose transit investments as their top priority are willing to pay more to get their project built than are those who chose widening roads

- Half of all respondents said that public transportation is their top priority
- Whether living in Prince William County or Arlington County, residents favor transit improvements
- When offered side-by-side comparisons Northern Virginians favored an increase in the sales tax over income or gas tax increases

Technical Evaluation

The technical analysis procedures that were applied for the TransAction 2030 plan process represented the state-of-the art in travel demand modeling and transit and multimodal level of service techniques. These techniques were specifically chosen to evaluate the comprehensive range of TransAction 2030 modal projects and, more importantly, the interactions between modes.

The latest version of the MWCOG regional travel demand model was used to develop highway, HOV and transit system projections. MWCOG is continually upgrading their regional demand model to provide accurate projections of person travel for all travel modes. These projections take into account the interaction of the different modes from a regional perspective. The model is run for the entire MWCOG region, including Northern Virginia, suburban Maryland, the District of Columbia and parts of West Virginia. Travel surveys and 2000 Census data have been used to validate the model to known demographic characteristics and travel behavior.

The TransAction 2030 study effort included technical analyses for the following horizon years and transportation network alternatives:

- 2005
- 2015
- 2025
- 2030 CLRP
- 2030 CLRP +
- 2030 TransAction Plan

The 2030 CLRP network alternative included projects that were in the 2004 update which were approved by the National Capital Region Transportation Planning Board (TPB).

The finanicially CLRP is a comprehensive plan of transportation projects and a system-wide collection of strategies that the TPB and other metropolitan planning organizations (MPOs) around the country use to update their long-range plans every three years. In practice, the TPB has typically amended the CLRP every year, along with developing a new Transportation Improvement Program (TIP). Virginia, Maryland, the District of Columbia (D.C.), and Washington Metropolitan Area Transportation Authority (WMATA) submit lists of projects for TPB to include in the draft CLRP. Federal requirements and TPB policies play a key role in influencing the types of projects that the states and D.C. choose to pursue.

The 2030 CLRP + network alternative was developed by MWCOG as part of their Regional Mobility and Accessibility Study. This alternative included all of 2030 CLRP projects and a range of transit service improvements.

The TransAction 2030 Plan network included all CLRP and CLRP + projects, as well as the projects identified in the 2020 Transportation Plan.

The Northern Virginia 2020 Transportation Plan focused its level of service analyses on the automobile mode. However, over the past six years, nationally-accepted techniques for transit and multimodal evaluations for long range transportation planning have been developed and applied. The work in this area undertaken for the TransAction 2030 study represents one of the largest applications of these techniques in the United States to date.

Two types of alternative mode analyses were conducted for this study: (1) an evaluation of regional transit service and (2) a comparison of modal level of service along the eight major corridors in the region.

Regional transit service was evaluated using measures presented in the Transit Capacity and Quality of Service Manual, 2nd Edition (TCQSM). Five aspects of transit service that are important to passengers, and are quantifiable, were evaluated:

1. Service frequency – how often is service provided?
2. Hours of service – how many hours during the day is transit available to the public?
3. Service coverage – how much of Northern Virginia is served by transit?
4. Passenger load – how crowded are trains and buses?
5. Auto-travel transit time difference – how does the travel time by transit compare with the same trip by car?

Service coverage LOS was evaluated for the Northern Virginia area as a whole. Passenger load LOS was evaluated for all roadway segments with bus service, as well as for all rail lines. The remaining three measures – frequency, hours of service and travel time-were evaluated between activity center pairs.

Multimodal corridor performance was evaluated using techniques developed by the Florida Department of Transportation and refined for this study. These techniques constitute the best-researched and tested methodologies currently available for side-by-side comparisons of auto, bus, pedestrian and bicycle quality of service on urban streets. A notable aspect of this LOS approach is the interaction between modes and their respective LOS. For example, adding a lane to a street may improve auto LOS but also lower bus LOS by making it harder for passengers to cross the street to get to a bus stop.

Telephone Survey

The NVTA directed that a household telephone survey be conducted to gauge citizen input on transportation priorities and potential funding mechanisms. Further, they wanted this survey to be accurate at the jurisdiction level. A survey consultant was commissioned to conduct this survey and a total of 1,263 Northern Virginia adults over the age of eighteen were surveyed. A detailed description of the survey results is provided in Section 5.2 of this document; a summary of the key findings includes:

- The public supported multimodal solutions
- Those who chose transit as their top priority are willing to pay more to get their project built than are those who chose road widening
- Half of all respondents said that public transportation is their top priority
- Regardless of jurisdiction in which they reside, residents favor transit improvements
- When offered side-by-side comparisons Northern Virginians favored an increase in the sales tax over income or gas tax increases

1.3 Plan Organization

Section 2 of this TransAction 2030 plan document presents an overview of the transportation challenges facing the Northern Virginia region. Current 2005 conditions are examined by mode to gain an insight into the challenges facing the region. Addressing these challenges guided development and evaluation of the TransAction 2030 Transportation Plan.

Section 3 of this TransAction 2030 plan document describes the TransAction 2030 Plan projects and the system-level evaluation criteria established to measure the Plan's success in addressing the study's goals. System-level evaluation results will be presented comparing 2005, 2030 CLRP and TransAction 2030 Plan performance.

Section 4 of this TransAction 2030 plan document describes the project prioritization methodology that was applied and detailed results of the public involvement program and telephone survey. The section concludes with presentation of the prioritized project lists by corridor.

Section 5 of this TransAction 2030 plan document describes the project cost estimation methodology and cost estimates for each TransAction 2030 Plan project.

2

Transportation Challenges in Northern Virginia

Northern Virginia is the Commonwealth's fastest growing region in terms of population, employment and development. People continue to be drawn to this area for job opportunities and its educational, cultural and historic attractions. A fundamental key to maintaining the region's prosperity is a sound transportation system. Northern Virginia's transportation network is multimodal, consisting of roads, transit, bicycle/pedestrian networks, and two major airports. The system is currently struggling to serve the traveling needs of residents and others traveling in and through the region for business or pleasure. The region must improve and invest in its transportation system or the Commonwealth will lose current and potential economic development and its accompanying revenue.

Within the next 25 years, Northern Virginia is expected to continue to attract highly educated professionals as the area absorbs approximately 651,400 new jobs, or more than half of the new jobs expected to come to the Metropolitan Washington Region. It is also projected to attract 918,500 new residents or 56 percent (%) of those expected to relocate to the Metropolitan area. Today Northern Virginia is home to 2,164,700 residents and 1,238,900 jobs.

The Northern Virginia region accounts for 21% of the vehicle miles traveled on only 8% of the Commonwealth's roadway lane miles. It also accounts for 75% of transit ridership in the Commonwealth. Although Northern Virginia only accounts for 4% of the Commonwealth's land area, it is home to 23% of its population and 29% of its economic base. Accordingly, the entire transportation system needs an investment of resources to both maintain the integrity of the existing system and to increase the capacity of all modes of travel.

Apart from total Northern Virginia regional population and job growth, this region is home to many existing and growing activity centers. Figure 3 shows fifteen such activity centers that were selected by the study team to represent a cross-section of activity centers in the region. Later in this TransAction 2030 Plan document system-level and project-level performance criteria related to these activity centers will be presented. Table 1 contains a summary of the characteristics of each activity center

Figure 3 Activity Centers

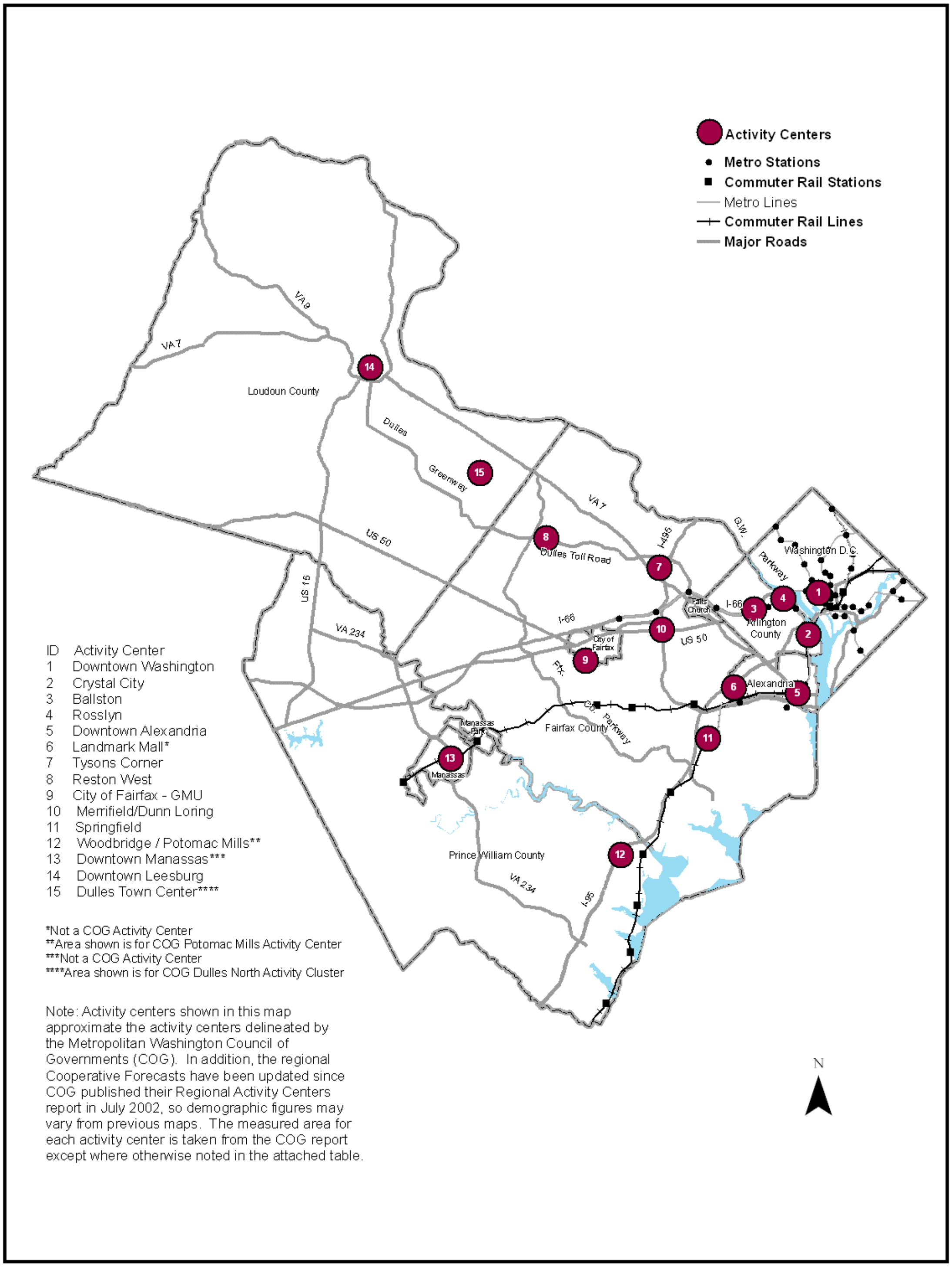


Table 1 Activity Centers' Characteristics

ID	Activity Center	2005 Area (Sq. Mi.)	2005 Area (Acres)	2005 Jobs	2005 Gross Job Density (Jobs/Acre)	2005 House-holds	2005 Gross HH Density (HH/Acre)	2030 Jobs	2030 Gross Job Density (Jobs/Acre)	2030 House-holds	2030 Gross HH Density (HH/Acre)	2005 – 2030 % Job Growth	2005 – 2030 % HH Growth
1	Downtown Washington	4.1	2,640	398,895	151.1	38,874	14.7	461,974	175.0	47,298	17.9	15.8%	21.7%
2	Crystal City	0.7	434	21,356	49.2	1,835	4.2	41,288	95.1	3,318	7.6	93.3%	80.8%
3	Ballston	0.4	248	17,922	72.3	4,775	17.7	41,966	165.9	7,983	30.8	51.7%	74.5%
4	Rosslyn	0.4	259	28,315	109.3	4,576	17.7	42,966	165.9	7,983	30.8	51.7%	74.5%
5	Downtown Alexandria	1.9	1,233	49,586	40.2	10,626	8.6	58,203	47.2	13,924	11.3	17.4%	31.0%
6	Landmark Mall[1]	0.4	285	3,022	10.6	4,451	15.6	3,022	10.6	4,451	15.6	0.0%	0.0%
7	Tysons Corner	3.3	2,128	99,327	46.7	7,460	3.5	127,036	59.7	8,192	3.8	27.9%	9.8%
8	Reston West	1.6	1,037	38,579	37.2	2,620	2.5	50,798	49.0	3,007	2.9	31.7%	14.8%
9	City of Fairfax – GMU	2.2	1,412	13,799	9.8	2,496	1.8	15,396	10.9	2,827	2.0	11.6%	13.3%
10	Merrifield/Dunn Loring	2.1	1,363	32,581	23.9	4,075	3.0	42,700	31.3	4,571	3.4	31.1%	12.2%
11	Springfield	1	663	14,750	22.2	1,371	2.1	20,010	30.2	1,575	2.4	35.7%	14.9%
12	Woodbridge/ Potomac Mills[2]	5.7	3,648	14,295	4.2	4,828	1.3	24,135	6.6	12,064	3.3	57.8%	149.4%
13	Downtown Manassas[3]	1.4	880	3,502	4.0	2,292	2.6	4,047	4.6	2,549	2.9	15.6%	11.2%
14	Downtown Leesburg	2.4	1,521	9,619	6.3	5,925	3.9	18,026	11.9	6,578	4.3	87.4%	11.0%
15	Dulles Town Center[4]	10.3	6,573	30,638	4.7	3,113	0.5	56,889	8.7	5,191	0.8	85.7%	66.8%

1 Not a COG Activity Center
2 Area shown is for COG Potomac Mills Activity Center
3 Not a COG Activity Center
4 Area shown is for COG Dulles North Activity Center
Source: MWCOG Round 6.4a Cooperative Land Use Forecasts

2.1 Highway and HOV System Challenges

Figures 4 and 5 show highway system peak period performance for 1999 and 2005, respectively. As shown, highway operating conditions have deteriorated significantly over the past six years. This is due to ever-increasing vehicular demand on a highway system without the capacity to serve it. Major highways experiencing more than one or more hours of stop-and-go congestion in 2005 include portions of I-66, I-495, I-395, I-95, VA 267, US Route 1, VA 7, US Route 123 and the George Washington Memorial Parkway. Many of the more minor roadways feeding these highways are also highly congested. In fact, there are few arterial roadways in Northern Virginia that don't experience at least occasional periods of stop-and-go congestion. Conditions in 2030, even with implementation of the MWCOG CLRP projects, are projected to deteriorate further as a forecasted 42% increase in population and a 52% increase in jobs further strains the highway system.

Figure 4 1999 Highway System Peak Period Performance

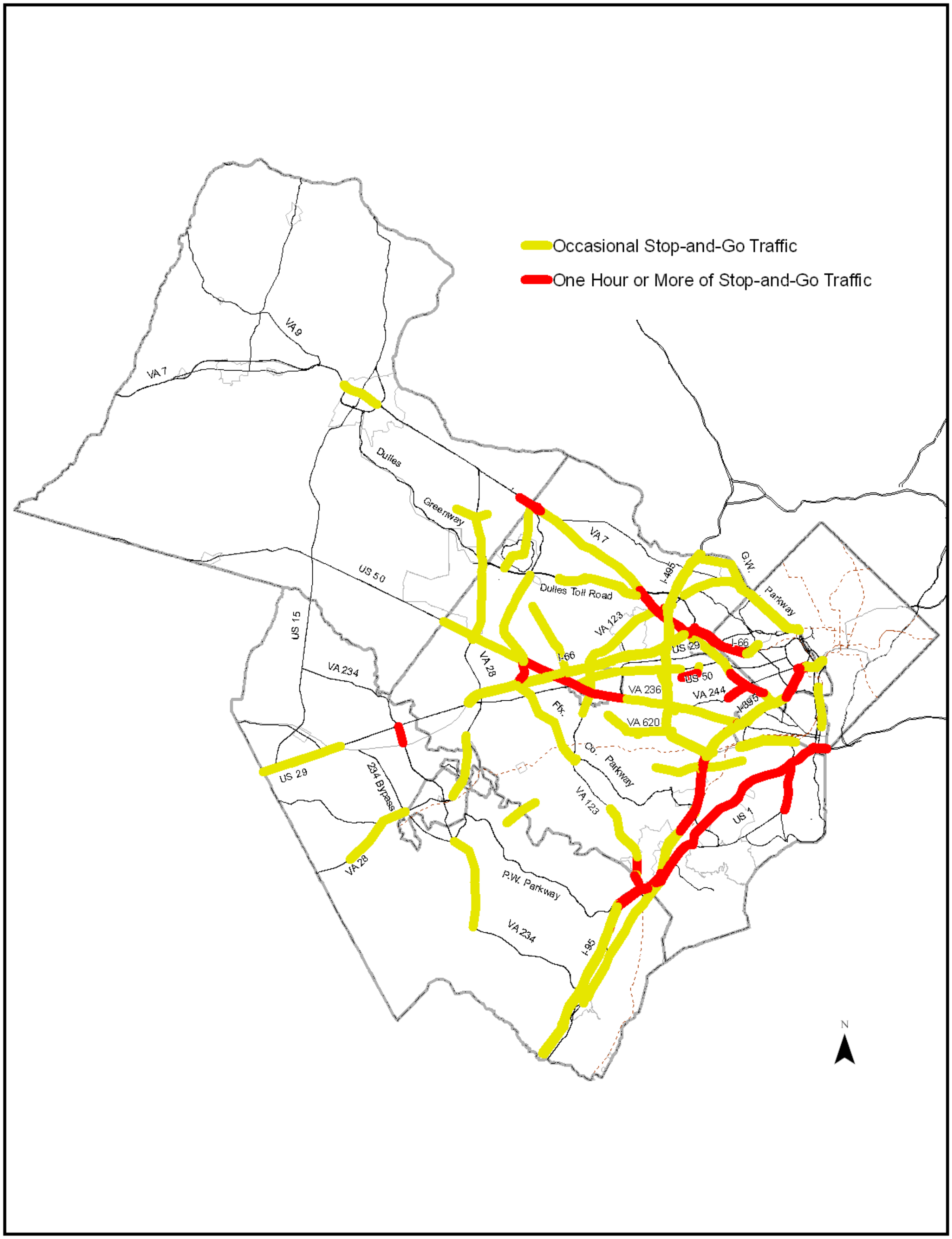
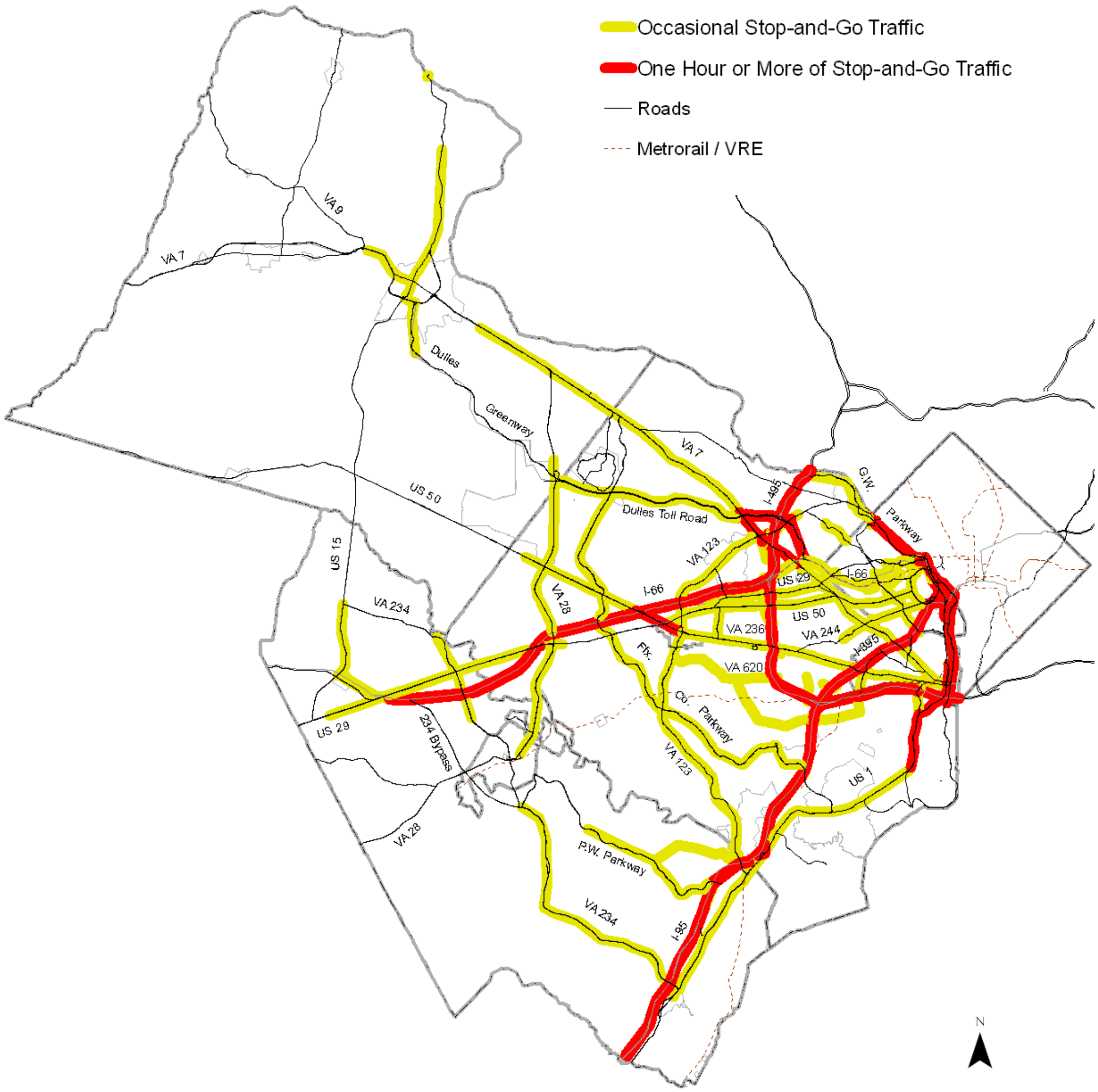


Figure 5 2005 Highway System Peak Period Performance



Interestingly, even portions of the HOV system are approaching capacity. Sections of the I-66 HOV lanes are at capacity in 2005, as are sections of the I-95/I-395 HOV facility. This has serious negative effects on carpooling, vanpooling and commuter bus modes as travelers are no longer able to experience the higher speeds and shorter commuting times that encourage the use of these modes of travel. Fortunately, HOV travel conditions are projected to improve as I-66 and I-95/I-395 HOV system improvements in the MWCOG CLRP are completed, including extension of I-66 HOV lanes to Gainesville and provision of three HOV lanes on I-95/I-395.

2.2 Transit System Challenges

Transit system challenges were identified by examining several transit LOS elements:

- Transit service coverage
- Passenger load LOS
- Activity Center LOS

A summary of the results of each these elements are provided below. A complete set of the results is provided in the Technical Appendix.

Current Transit Service Coverage

Service coverage is evaluated for the region as a whole. Research has shown that most passengers will walk ¼ mile or less to local bus stops and ½ mile or less to transit stations, with the majority of passengers living or working within a 2- or 3-minute walk of a stop. Therefore, the maximum area served by a transit route is defined as the area within ¼ mile of a bus route (assuming buses stop to serve passengers along that section of the route), and the area within ½ mile of a rail station.

Recognizing that the walking distance to a bus stop is usually greater than the straight-line ("as the crow flies") distance, two adjustment factors are applied to these default distances. The first factor adjusts the distance based on how well-connected an area's streets are (e.g., a grid street network that allows relatively direct travel in all directions, versus a cul-de-sac pattern that may require significant out-of-direction travel to walk to a stop). The second factor adjusts for pedestrian delay crossing wide, busy streets when walking to or from a bus stop. The details of these factors are provided in the Technical Appendix.

Service coverage LOS is based on the percentage of the region's "transit-supportive area" that lies within walking distance of a transit route or station. Transit-supportive areas have sufficient household and/or employment density to support at least hourly transit service during the day. Transit-supportive areas are defined as having at least 3 households per gross acre and/or 4 jobs per gross acre.

It should be kept in mind that service coverage LOS measures transit availability in higher-density areas, where most passengers walk to transit stops and stations. In lower-density areas, such as most of Loudon and Prince William Counties, passengers would typically drive to park-and-ride lots to access transit. Commuter rail and commuter bus lines serve these lower-density markets, but these services typically only operate during peak periods and often only in the peak direction. Service coverage LOS does not address the contribution of park-and-ride lots to transit availability. This is pertinent to the Route 1 and Route 7 corridors outside the Beltway, for example.

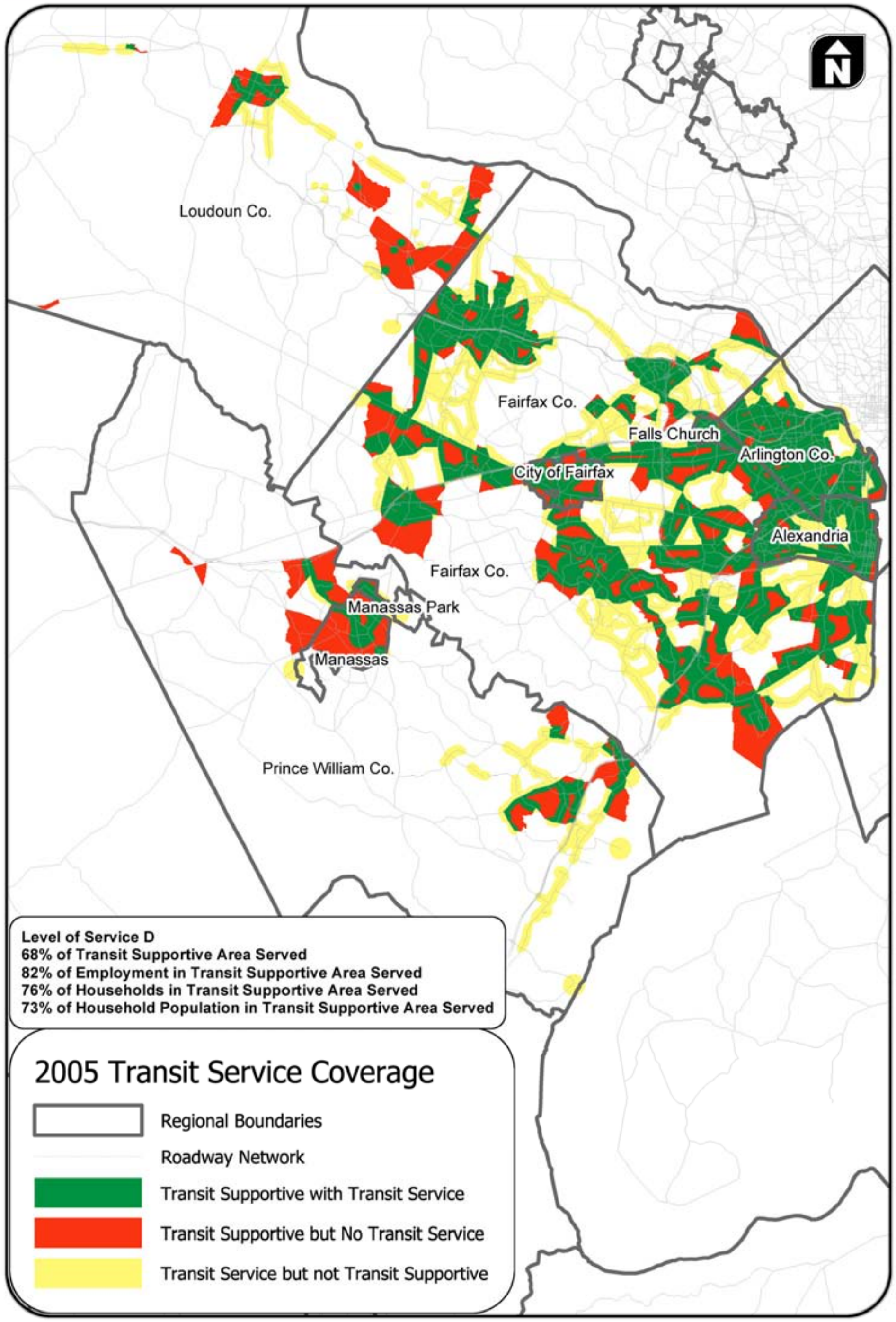
Figure 6 shows 2005 regional service coverage. Areas served by transit are shown in green and yellow. Transit-supportive areas are shown in green and red. Service coverage LOS is measured by dividing the green area by the combined green and red areas. In 2005, 68% of the region's transit-supportive areas were served by transit, corresponding to LOS D. In general, the closer to Washington, D.C. an area was, the more likely it was to be served by transit: for example, nearly all of Alexandria's and Arlington County's transit-supportive areas are served, while residents of many transit-supportive areas around Dale City, Manassas, Centreville, Chantilly, Herndon, and Sterling have no service within walking distance and must rely on park-and-ride lots to access transit. In the latter areas, transit may be an option for commute trips, if one has access to a car, but not for other kinds of trips.

AM Peak Hour Passenger Load Level of Service

Passenger load LOS is based on the level of crowding within a bus or train. The TCQSM provides two methods of measuring crowding: (1) the *load factor*—the number of passengers divided by the number of seats—and (2) *standing passenger area,* the interior vehicle area available for standees divided by the number of standees. The measure used in a given situation depends in part on how services are designed—for example, whether most passengers are expected to have a seat (e.g., bus and commuter rail) or whether most passengers are expected to stand (e.g., a typical New York subway car).
For services designed to have most passengers standing, when specific vehicle information is available, the TCQSM recommends using load factor for LOS A to C (the LOS ranges where everyone can get a seat) and standing passenger area for LOS D to F (the LOS ranges where some passengers must stand). For transit services designed to have most passengers standing, the TCQSM recommends using standing passenger area for all LOS grades.

Because many different types of buses and commuter rail cars are used throughout the Northern Virginia region, it is not possible to calculate a typical standing area for these modes. Instead, passenger load LOS for these modes is based on load factor for all LOS grades. In contrast, Metrorail cars have similar—although not exactly the same—characteristics, and a standing area can be calculated for them. Because Metrorail cars devote more interior area to seating space than standing room, LOS A to C for Metrorail is based on load factor, while LOS D to F is based on standing passenger area.

Figure 6 2005 Transit Service Coverage LOS



It should be kept in mind that passenger load LOS reflects the passenger point-of-view. Service that operates at LOS A or B (less than three-quarters of the seats filled at the maximum load point) is often unproductive service from an agency point-of-view, but quite comfortable from a passenger point-of-view. Transit modes that serve long trips (e.g., commuter buses and commuter rail) typically try to provide a seat for every passenger, but also often charge a premium fare for the faster, more comfortable trip.

Virginia Railway Express (VRE)

The existing VRE rail system consists of two lines, Fredericksburg and Manassas, with 30-minute headways operated on each branch. Because commuter rail trips tend to be relatively long, the goal is to provide a seat for every passenger on all trips (i.e., LOS C conditions or better). In 2005, the following line sections would typically have standing passengers on at least one peak hour train: Rippon to Union Station and Burke Center to Union Station. Figure 7 shows LOS results for all of the VRE system in Northern Virginia.

Metrorail

Metrorail operates three lines in Northern Virginia: the Orange Line from Vienna/ Fairfax-GMU to D.C. via the Rosslyn–Foggy Bottom tunnel, the Yellow Line from Huntington to D.C. via the 14th Street Bridge, and the Blue Line from Franconia-Springfield to D.C. via the Rosslyn–Foggy Bottom tunnel. During the weekday a.m. peak hour between 7:30 and 8:30 am, 15 trains are scheduled on the Orange Line inbound from the Vienna/Fairfax-GMU station, with 5 additional trains scheduled inbound from the West Falls Church-VT/UVA station. Both the Blue and Yellow lines schedule 10 trains per hour during the weekday a.m. peak hour.

LOS A-C represents conditions where all passengers can find a seat on a train (although the more crowded cars of a train may have some standees at LOS C). WMATA's loading standard is an average of 120 passengers per rail car, which is depicted as LOS D on the Metrorail passenger load LOS maps. LOS E represents achievable, but highly crowded loading levels beyond WMATA's standard. LOS F represents crush loading conditions where passengers would routinely be left on the platform due to a lack of space aboard trains. 2005 Metrorail passenger load LOS is shown in Figure 8. Crowded conditions are found north of the Pentagon on the Blue Line and east of the Ballston-Marymount University Station on the Orange Line, including Clarendon, Courthouse and Rosslyn.

Figure 7 2005 VRE Passenger Load LOS

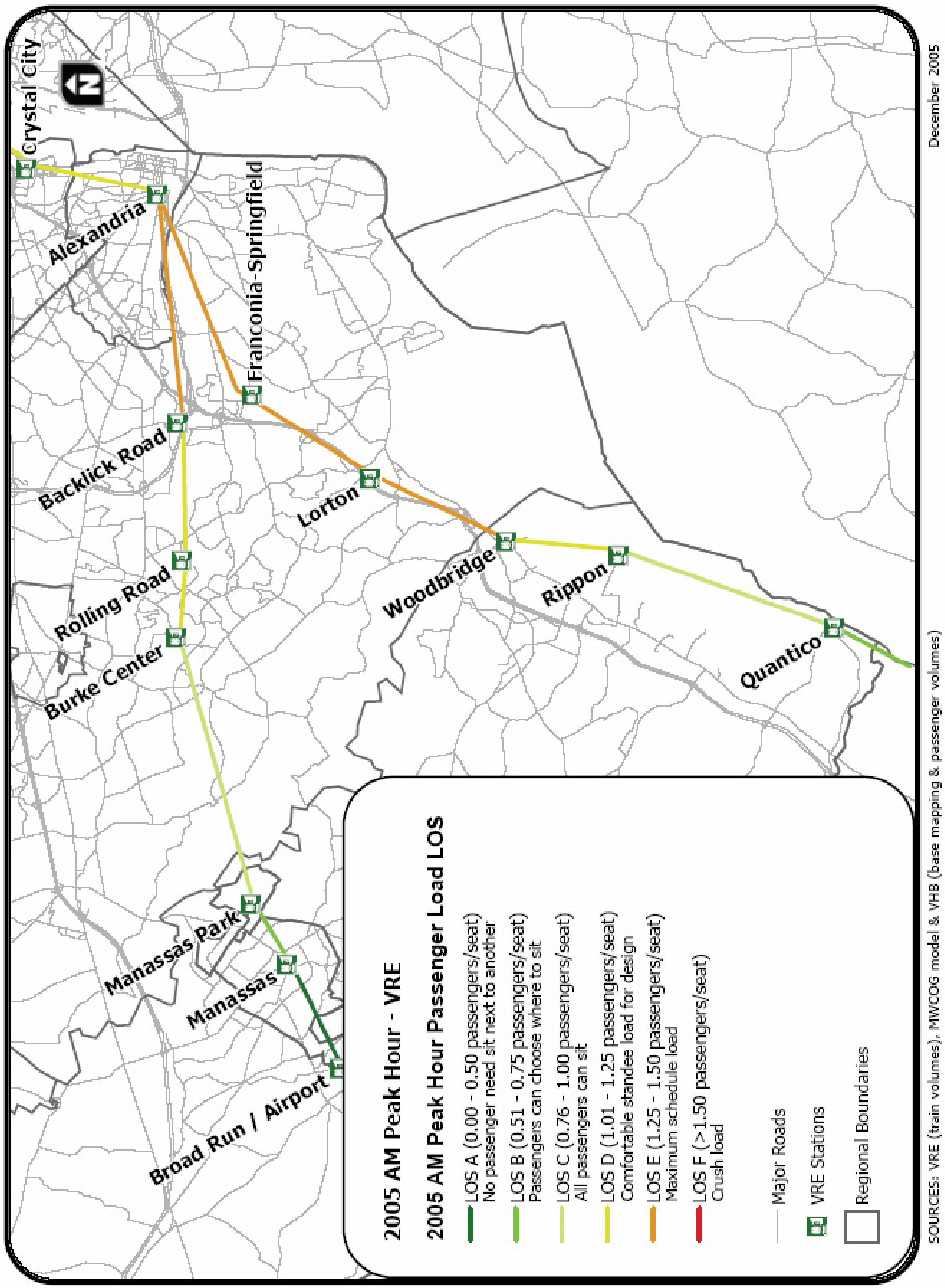
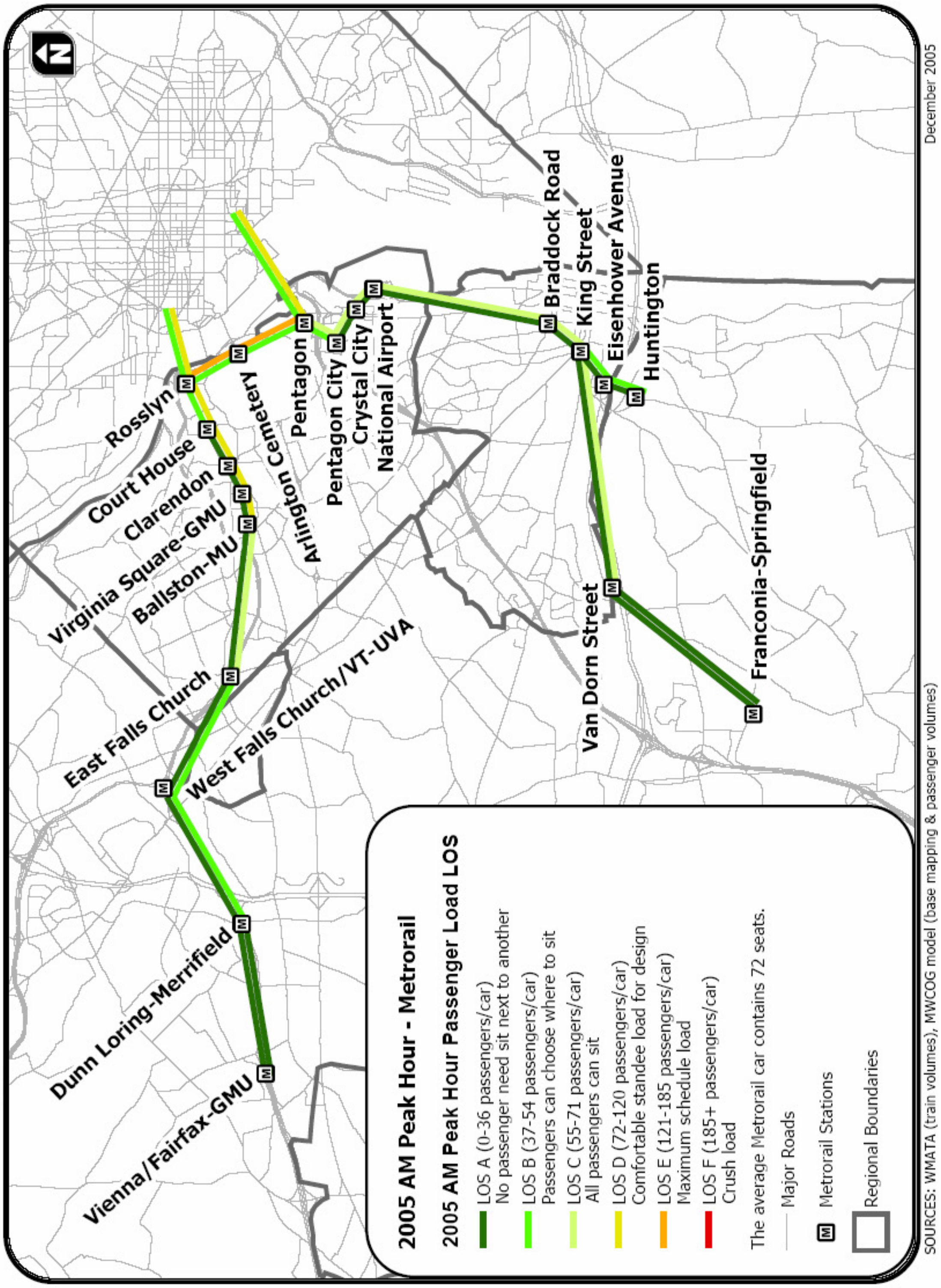


Figure 8 2005 Metrorail Passenger Load LOS



Bus

Bus service within the region is provided by a number of agencies, including WMATA, Arlington Transit, Fairfax Connector, CUE (City of Fairfax), DASH (City of Alexandria), and OmniRide, among others. The regional model forecasts transit service at the roadway link level—that is, the roadways included in the regional model are coded as having bus service or not, without regard to the specific service provider or specific bus routings. Each roadway link is also coded with the number of buses using the link during the three-hour peak period.

LOS A-C represents conditions where all passengers can get a seat during the peak 15 minutes of the peak hour. However, during peak periods, local bus service is typically scheduled with the expectation that some passengers may have to stand (i.e., LOS D or LOS E). LOS F represents crush loading conditions where a bus may have to pass up passengers. Figure 9 shows bus passenger load LOS by roadway link. The route miles with a given bus LOS in 2005 are as follows:

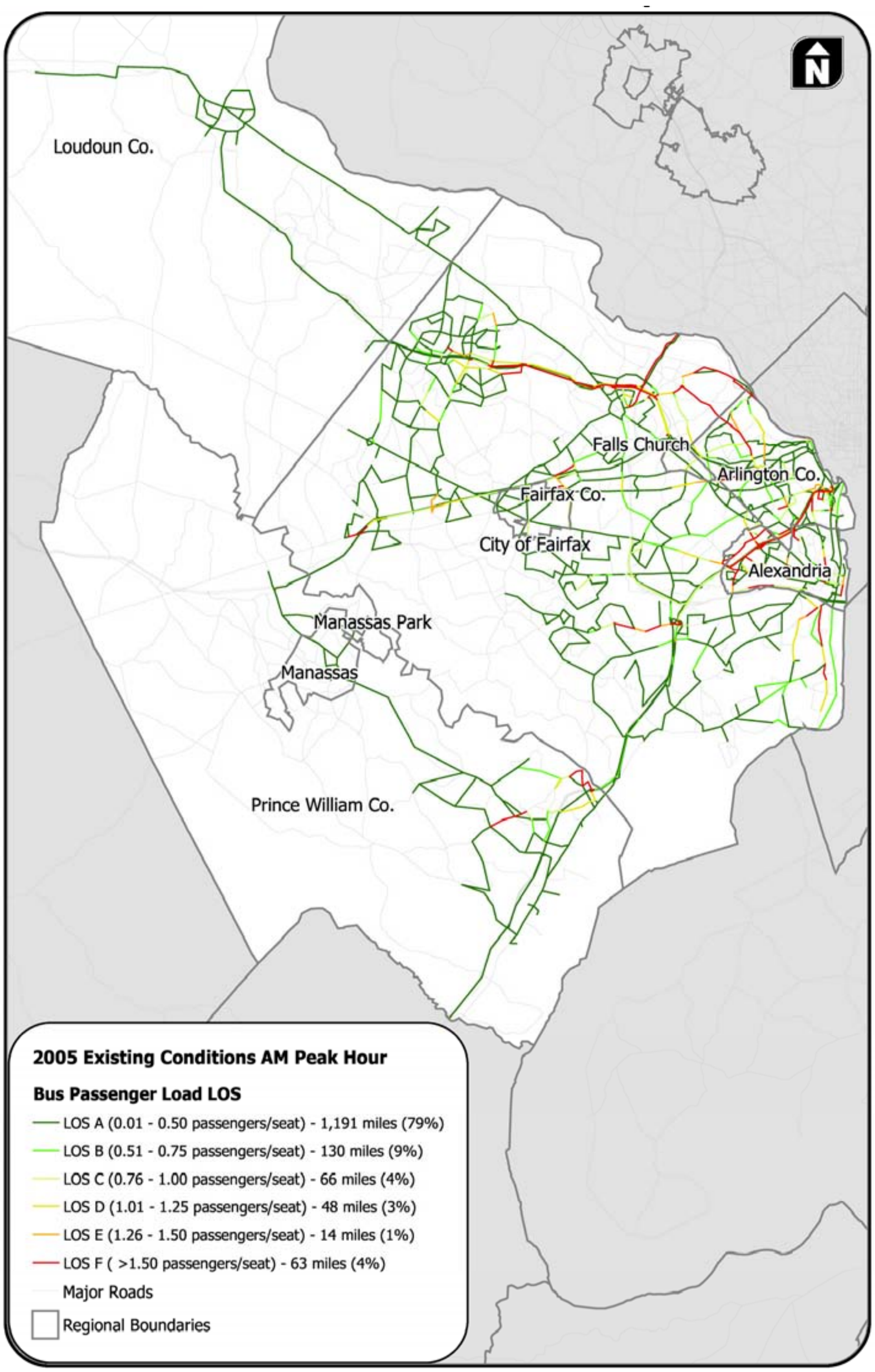
- LOS A: 1,191 miles (76%)
- LOS B: 130 miles (8%)
- LOS C: 111 miles (7%)
- LOS D: 48 miles (3%)
- LOS E: 14 miles (1%)
- LOS F: 63 miles (4%)

Activity Center LOS

Activity center LOS was calculated for the following activity centers, which were shown in Figure 3. LOS for activity centers is characterized by three LOS measures—frequency, hours of service, and travel time. Each of these were evaluated for trips between pairs of activity centers, giving an overview of the quality of transit service provided between different portions of the region.

- Manassas
- Leesburg
- Dulles Town Center
- Reston West
- Fairfax/GMU
- Woodbridge
- Tysons Corner
- Merrifield/Dunn Loring
- Springfield
- Landmark Mall

Figure 9 2005 Bus Passenger Load LOS



- Ballston
- Rosslyn
- Alexandria
- Crystal City
- Washington

At service frequency LOS A, the maximum scheduled wait for a bus or train is under 10 minutes, and passengers do not need to consult schedules to make a trip—they simply travel to a stop, knowing that they will not have to wait long for service. At LOS F, the interval between buses or trains is greater than an hour. LOS A or B service is generally available during peak hours between activity centers served by Metrorail, plus Tysons Corner, Reston West, and Landmark Mall. LOS E or F service is provided from most activity centers to Leesburg and Dulles Town Center and between most activity centers in Prince William and Loudon Counties.

At hours of service LOS A, trips can be made into the early morning hours or even all night. At LOS F, the only service provided is peak period, peak-direction service. LOS A or B service is generally available on weekdays between activity centers served by Metrorail, plus Tysons Corner and Reston West. LOS E or F service is generally provided on weekdays to and from Leesburg and Dulles Town Center and between Manassas and Woodbridge.
Travel time LOS quantitative measures range from LOS A (faster by transit than by auto) to LOS F (Greater than 60 more minutes travel time on transit compared to auto = unacceptable). The LOS travel time models contain enormous amounts of useful travel time analysis. This section will discuss a few of the key findings. Transit challenges are faced at LOS D though LOS F (Greater than 30 more minutes travel time on transit compared to auto). From the activity centers listed above, current travel times to and also between Leesburg, Manassas, Woodbridge and Dulles Town Center - except from Reston-are between LOS D through LOS F. A current challenge for transit will be to address travel times to and between Leesburg, Manassas, Woodbridge and Dulles Town Center.

Manassas and Woodbridge generally have LOS A through C to Springfield, Alexandria, Arlington, and D.C. activity centers. This can be explained by existing commuter services running inbound toward DC in the AM peak period. A challenge for transit is to address travel times from Manassas and Woodbridge to the remainder of the activity centers. In addition, travel time from Leesburg to the majority of activity centers; travel time to the City of Fairfax / George Mason University (GMU) from many of the activity centers and from Fairfax / GMU to Springfield; travel time between Tysons Corner and both Landmark and Springfield; and travel time between Dunn Loring and both Landmark and Springfield; travel time from Crystal City to Tysons Corner and travel time from Dulles to Springfield are current challenges.

Transit-auto travel time LOS is the difference in door-to-door travel times for an identical trip made by auto and by transit. The regional model was used to determine both the auto and transit travel times for trips between a given pair of acitivty centers. The model's output includes all aspects of a trip – walk, wait, and in-vehicle time – and therefore no adjustments were needed to account for out-of-vehicle travel. The LOS thresholds are as follows:

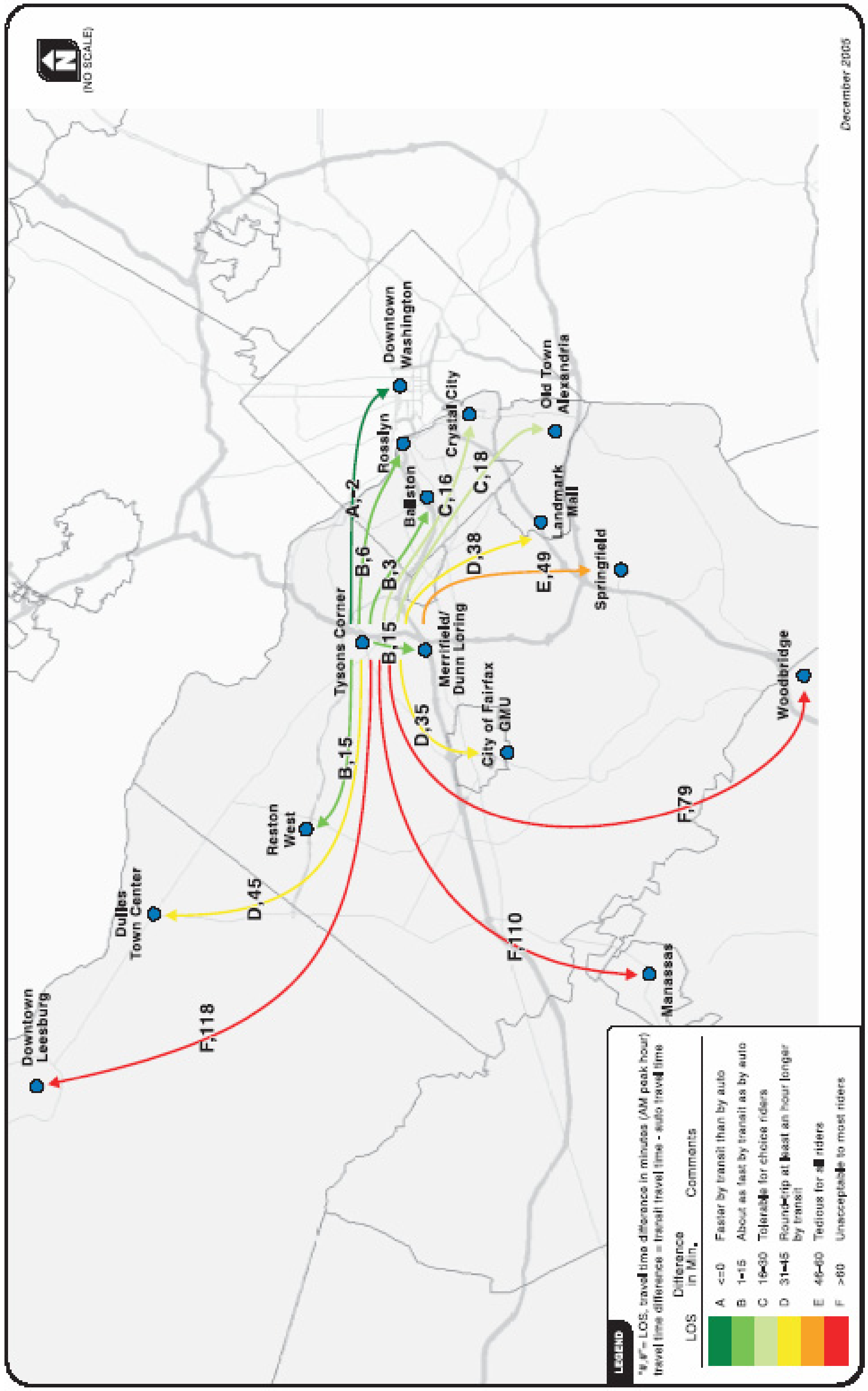
LOS	Travel Time Difference (minutes)	Comments
A	≤ 0	Faster by transit than by automobile
B	1-15	About as fast by transit as by automobile
C	16-30	Tolerable for choice riders
D	31-45	Round-trip at least an hour longer than by transit
E	46-60	Tedious for all riders
F	> 60	Unacceptable to most riders

Figure 10 provides a sample map showing the transit-auto travel time LOS from Tysons Corner to the other activity centers. A complete set of maps for all activity centers is provided in the Technical Appendix, along with tables giving the LOS results for all activity center pairs.

Within the area roughly outlined by the Fairfax County Parkway, plus the Reston West area, transit service is provided to most higher-density areas (and many less-dense areas) and transit travel times between activity centers are generally competitive with the automobile during peak periods. Service between activity centers is generally frequent and operates at least 17 hours a day.

Farther out in the region (e.g., Woodbridge, Manassas, Leesburg, and Dulles Town Center), few areas currently have sufficient density to support all-day hourly transit service. Transit is most competitive with the automobile for commute trips into Arlington County, Alexandria, and Washington, D.C. Travel options by transit between the Leesburg and Dulles Town Center activity centers and the rest of the region are limited.

Figure 10 Transit-Auto Travel Time LOS for Tysons Corner



2.3 Park-and-Ride Lot Challenges

The 75 regional park-and-ride lots supplement the transportation system by providing capacity for bus riders and carpoolers utilizing the HOV lanes along I-66 and I-95 / I-395. Currently, excess Park-and-Ride capacity exists across all Northern Virginia jurisdictions. The 2030 CLRP network does not add any new park-and-ride lot capacity. By 2030, park-and-ride lot usage will increase 37% in Arlington County, 34% in Fairfax County, 53% in the City of Fairfax, and 39% in Prince William County. Park-and-ride lot usage will decrease 22% in Loudoun County as former bus riders and carpoolers divert to the extended Metrorail Orange Line. Other regional rail transit improvements temper the growth of park-and-ride lot usage in Arlington and Fairfax Counties. Prince William County, which currently has both the most park-and-ride lot capacity and the most usage in the region, does not receive any new rail transit lines in the 2030 CLRP and thus has the highest rate of growth in park-and-ride lot usage among the larger regional jurisdictions. Both Fairfax and Prince William Counties exceed their available park-and-ride lot capacities in the 2030 CLRP scenario (see Table 2).

Table 2 Regional Park-and-Ride Usage, Current Conditions and 2030 CLRP

Jurisdiction	Total Lots	Park-and-Ride Capacity[1]	Base Usage	2030 CLRP Usage	Base Usage/Capacity	2030 CLRP Usage/Capacity
Arlington	3	748	209	286	0.28	0.38
Fairfax	28	6,517	4,894	6,535	0.75	1.00
City of Fairfax	4	110	15	23	0.14	0.21
Loudoun	13	1,584	823	635	0.52	0.40
Prince William	27	7,674	5,820	8,067	0.76	1.05

1 85% of total lot capacity
Note: Does not include Metrorail or VRE parking lots

Park-and-ride lot LOS was calculated for 2005 conditions. Three grades of LOS were applied: 1) lot reaches capacity before the end of the AM peak period, 2) lot reaches capacity by the end of the AM peak period and 3) lot has available capacity throughout the day. Capacity of each lot was assumed to represent 85% of actual lot capacity as measured by the number of marked parking spaces.

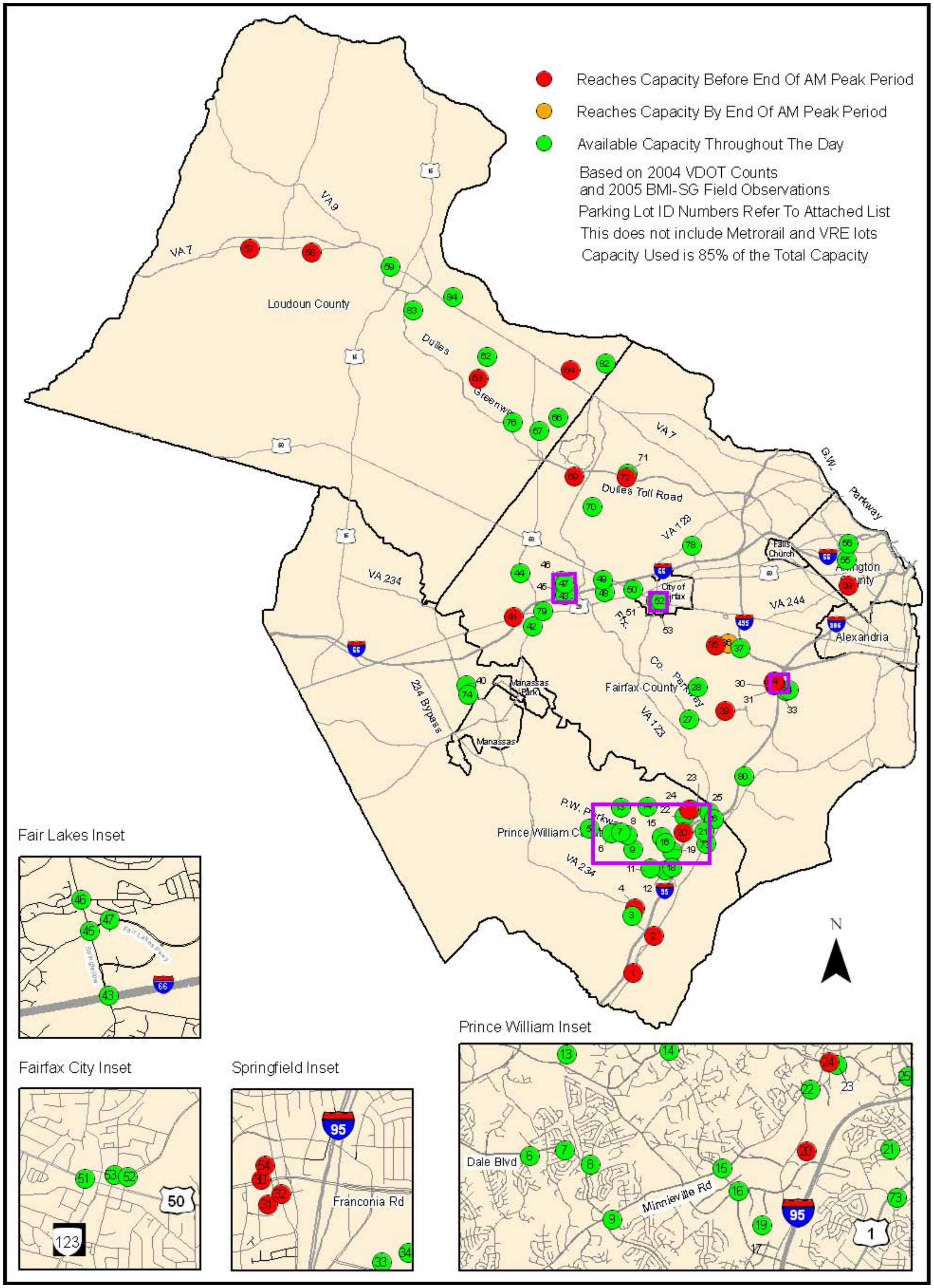
For 2005, the following lots reached capacity before the end of the AM peak period, a total of 19:

1. Columbia Pike/Four Mile Run in Arlington
2. American Legion Post # 176 in Fairfax County
3. Herndon Monroe in Fairfax County
4. Parkwood Baptist Church in Fairfax County
5. Reston East in Fairfax County
6. Springfield Methodist Church in Fairfax County
7. Springfield Plaza in Fairfax County
8. Springfield Plaza K-Mart in Fairfax County
9. Sydenstricker/Hooes in Fairfax County
10. US 29/Stone Road in Fairfax County
11. Ashburn Farm in Loudoun County
12. Cascades in Loudoun County
13. Hamilton Baptist Church in Loudoun County
14. St. Andrew's Presbyterian Church, Purcellville in Loudoun County
15. Lake Ridge Commuter Lot in Prince William County
16. Montclair Commuter Lot in Prince William County
17. Prince William Parkway Lot in Prince William County
18. US 1/VA 619 in Prince William County
19. US 1/VA 234 in Prince William County

Also, in 2005, the following lot reached capacity by the end of the AM peak period: Canterbury Woods Park in Fairfax County

The complete set of park-and-ride lot utilization and LOS results is provided in the Technical Appendix. 2005 park-and-ride lot LOS is shown in Figure 11.

Figure 11 2005 Park and Ride Lot LOS



2.4 Bicycle and Pedestrian System Challenges

VDOT initiated the *Northern Virginia Regional Bikeway and Trail Network Study*, VDOT November 2003, to identify the facilities and steps necessary to develop a Northern Virginia bicycle and trail network. The study helped to coordinate local planning efforts and to identify necessary connections between activity centers. The objective of this study was to make recommendations that will lead to creation of a regional bicycle and trail network that will help establish bicycling as a viable travel alternative in Northern Virginia. Based on an evaluation of the existing bicycle and trail network and public input, the study identified the desired future regional bike network and specific steps necessary to realize the region's bikeway goals.

As a regional initiative, the study evaluated longer distance bicycle and trail connections within the region. It is important to note that the bicycle and trail network also contains numerous existing local segments that provide access to individual neighborhoods and local destinations. The regional bikeway and trail network already contains several portions of existing on-road and off-road bicycle facilities. In total, the existing or regionally funded significant bikeways and trails include:

- 189 miles of bike lanes, shared-use paths, and trails alongside roadways
- 69 miles of planned and funded facilities

Existing Northern Virginia off-road bicycle and trail facilities attract both residents and visitors for a variety of transportation and recreation purposes. The study cited the Washington and Old Dominion (W&OD) and Mount Vernon trails for their heavy use. Other major trails include the Custis Trail, Four Mile Run Trail, Fairfax County Parkway Trail, and Prince William Parkway Trail. Additionally, on-road bicycle facilities provide important connections within the region. Both Commonwealth Avenue in Alexandria and Eads Street in Arlington have bike lanes. Bicycle connections are also facilitated by several grade-separated crossings of major highways, including bridges over Interstates 66, 395, 495, and US Route 50.

Although significant portions of the regional network are already in place in Northern Virginia, the region faces challenges to establishing bicycling as a meaningful transportation alternative. Many routes within the region are inconvenient and difficult for bicyclists to use. Furthermore, physical and land-use barriers deter people who would like travel by bicycle. Major challenges to cycling in the region include:

- Few bike lanes or wide shoulders on major through roads
- Discontinuous or unconnected bicycle and trail facilities
- Few parallel streets to major roads to serve as alternative routes
- Lack of appropriate signs to alert riders to route changes or alternatives

- Limited-access freeways and interstates without grade-separated bicycle and trail bridges
- Major intersections that put bicyclists and pedestrians in conflict with turning vehicles
- Sprawling, low-density development that spreads out and isolates land uses
- Insufficient bicycle parking facilities at transit stations in southern Fairfax County
- No signs leading bicyclists and pedestrians from trails and roadways to transit stations
- Lack of maintenance to address roadway conditions, including crumbling pavement, potholes, overgrown shrubbery, and slippery conditions due to ice and snow

Northern Virginia has the foundation of its regional bicycle and trail network in place, but the region will need to overcome several challenges to make bicycle travel a viable option. The study makes several recommendations for improvements based on the identified gaps in the current network.

The Northern Virginia Regional Bikeway and Trail Network Study made 13 recommendations designed to achieve the vision of an interconnected network of bikeways that provide a comfortable, convenient, and safe transportation option. The study's recommendations are broken into two categories: bikeway and trail network recommendations and policy and planning recommendations. The bikeway and trail network recommendations are necessary to develop bicycle infrastructure to connect activity centers throughout Northern Virginia.

The major recommendations from this study are as follows:

- Establish a regional network of on-road bike lanes, paved shoulders, and shared use paths within and between activity clusters
- Eliminate critical gaps in the existing bikeway and trail network
- Upgrade regionally-significant trails to industry standards
- Establish a system of high quality commuter corridors that connect outlying areas directly to core urban areas
- Establish a route signage system that is easily and quickly understood by bicyclists and pedestrians
- Improve the mass transit system to offer seamless connections for bicycle commuters
- Provide bicycle and trail access across major barriers
- Coordinate maintenance activities for bikeways and trails to ensure a high quality, safe experience for every user of the facilities

Planning and policy recommendations are designed to incorporate bicycle and trail access into the standard policies and procedures of local and state government, including:

- Encourage the use of context sensitive roadway design that facilitates bikeway and trail development in all jurisdictions
- Undertake comprehensive changes to land-use policies to encourage bicycle mobility and discourage development that is solely oriented to automobile access
- Augment regional planning efforts with local bikeway and trail planning, design and encouragement or promotional projects
- Identify sufficient funding sources to establish the regional bikeway and trail network
- Establish mechanisms to enable ongoing coordination and public involvement in regional bicycle and trail issues

In March 2004, VDOT adopted a policy for integrating bicycle and pedestrian accommodations, including pedestrians with disabilities, in the planning, funding, design, construction, operation, and maintenance of highway construction projects.

2.5 Multimodal Corridor Challenges

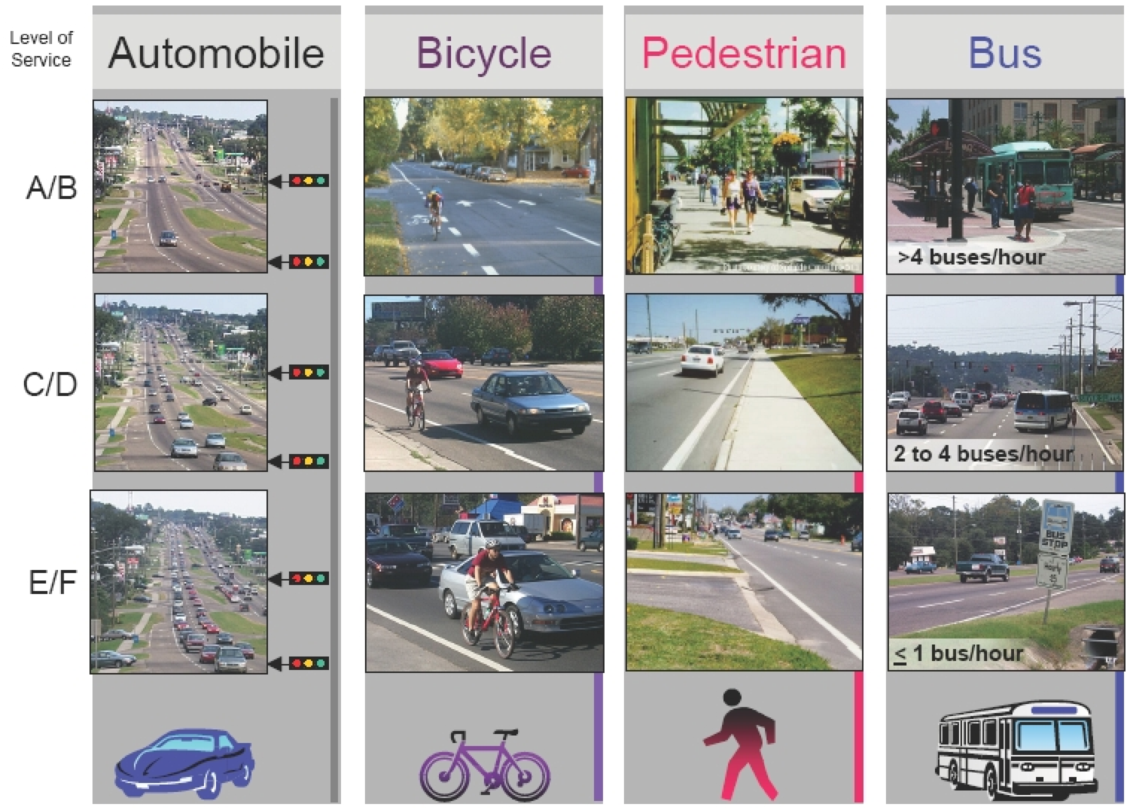
In order to identify transportation challenges on the arterials in the eight multimodal corridors established for this study, multimodal corridor AM Peak LOS was evaluated. Previous versions of the Northern Virginia Transportation Plan have defined eight corridors that serve a majority of longer-distance trips through the region. The corridors include a limited-access roadway, such as a freeway, and one or more parallel arterials. For example, the I-95/I-395/US 1 corridor includes portions of I-95 and I-395 as the freeway, with US 1 as the parallel arterial. The roadways associated with the eight corridors are:

- I-95/I-395/US 1;
- I-66/US 29/US 50;
- Dulles/Virginia 7;
- Beltway (I-495);
- Tri-County/Loudoun County Parkway;
- Prince William County Parkway;
- Fairfax County Parkway; and
- Virginia 28.

Multimodal corridor performance is evaluated using techniques developed or refined by the Florida Department of Transportation (FDOT). These techniques constitute the best-researched and tested methodologies currently available for side-by-side comparisons of auto, bus, pedestrian, and bicycle service quality on urban streets. They are required for planning and preliminary engineering analyses within Florida, and have also been applied by a number of jurisdictions outside Florida for long-range transportation planning. The FDOT has developed several software packages to help measure multimodal quality of service; the ArtPlan package for urban streets was the one used for the Northern Virginia corridor analyses.

A notable aspect of the FDOT techniques is the interaction between the levels of service among various modes. For example, adding a lane to a street may improve auto LOS but also lower bus LOS by making it harder for passengers to cross the street to get to a bus stop. The transit portion of the multimodal LOS is interested in conditions at bus stops—can people get to the bus stop and how often does the bus come? Adding a lane to a road in both directions makes it harder for pedestrians to cross the street to get to/from a bus stop. In suburban areas, traffic signals are typically spaced farther apart than bus stops, so many passengers need to cross the street at unsignalized intersections. Even at a signalized intersection, adding a lane increases the time required for pedestrians to cross the street, which may end up being the controlling factor for how much green time is given the side street, thus offsetting at least some of the capacity benefits to the through street. Figure 12 shows examples of LOS conditions for each mode that was evaluated.

Figure 12 LOS Examples for Each Travel Mode

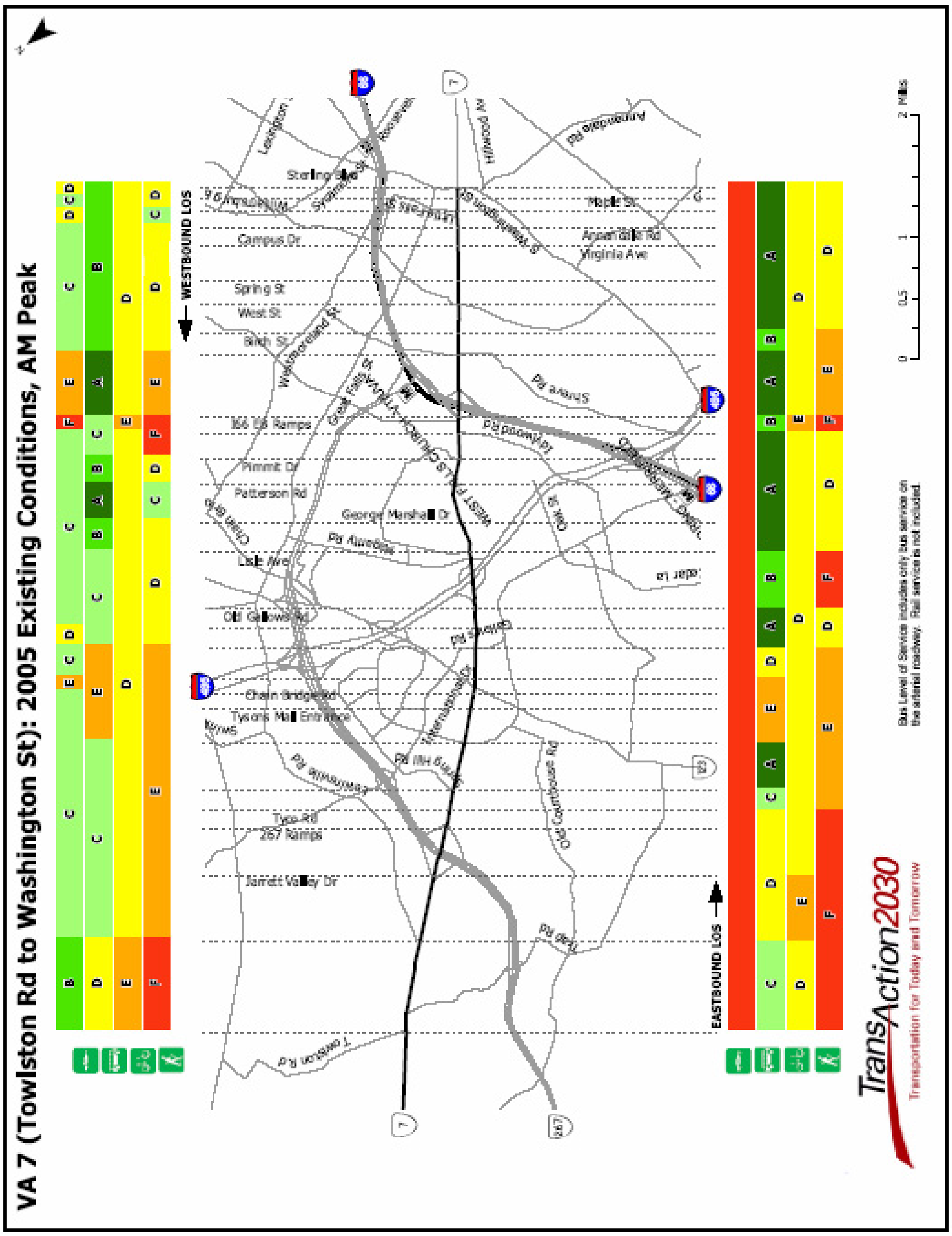


Significant findings are discussed below for multimodal corridor LOS in 2005. Inbound and outbound data are included in the model outputs; however, summary findings below include only peak flow inbound data. It should also be noted that multimodal corridor LOS analyses only include those facilities that are along each arterial or parallel to it in close proximity. The full set of multimodal corridor LOS results is provided in the Technical Appendix. Sample LOS graphics for portions of the major corridors are provided.

VA Route 7

For 2005, eastbound Route 7 auto LOS is mainly D, E or F. Transit LOS varies throughout the corridor with significant areas of LOS D and E. Bicycle LOS is mainly D and E. Pedestrian LOS is E and F for approximately 70% of the corridor.

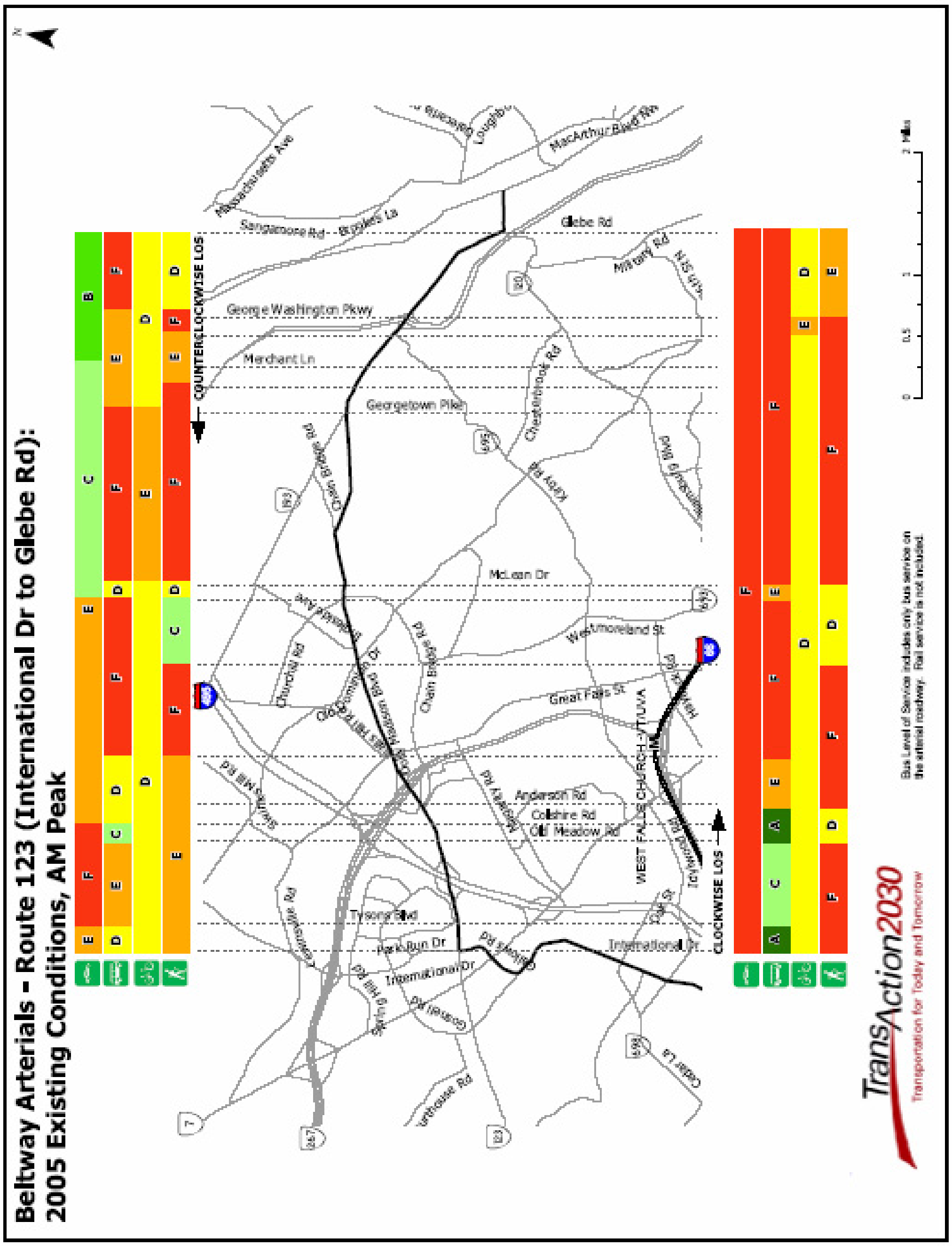
Figure 13 Route 7 Multimodal LOS



Beltway Arterials

For 2005 Beltway Arterials, auto LOS is mainly E and F. Transit LOS varies throughout the corridor with significant areas of E and F. Bicycle LOS is mainly D. Pedestrian LOS varies throughout the corridor, but is mainly D, E or F.

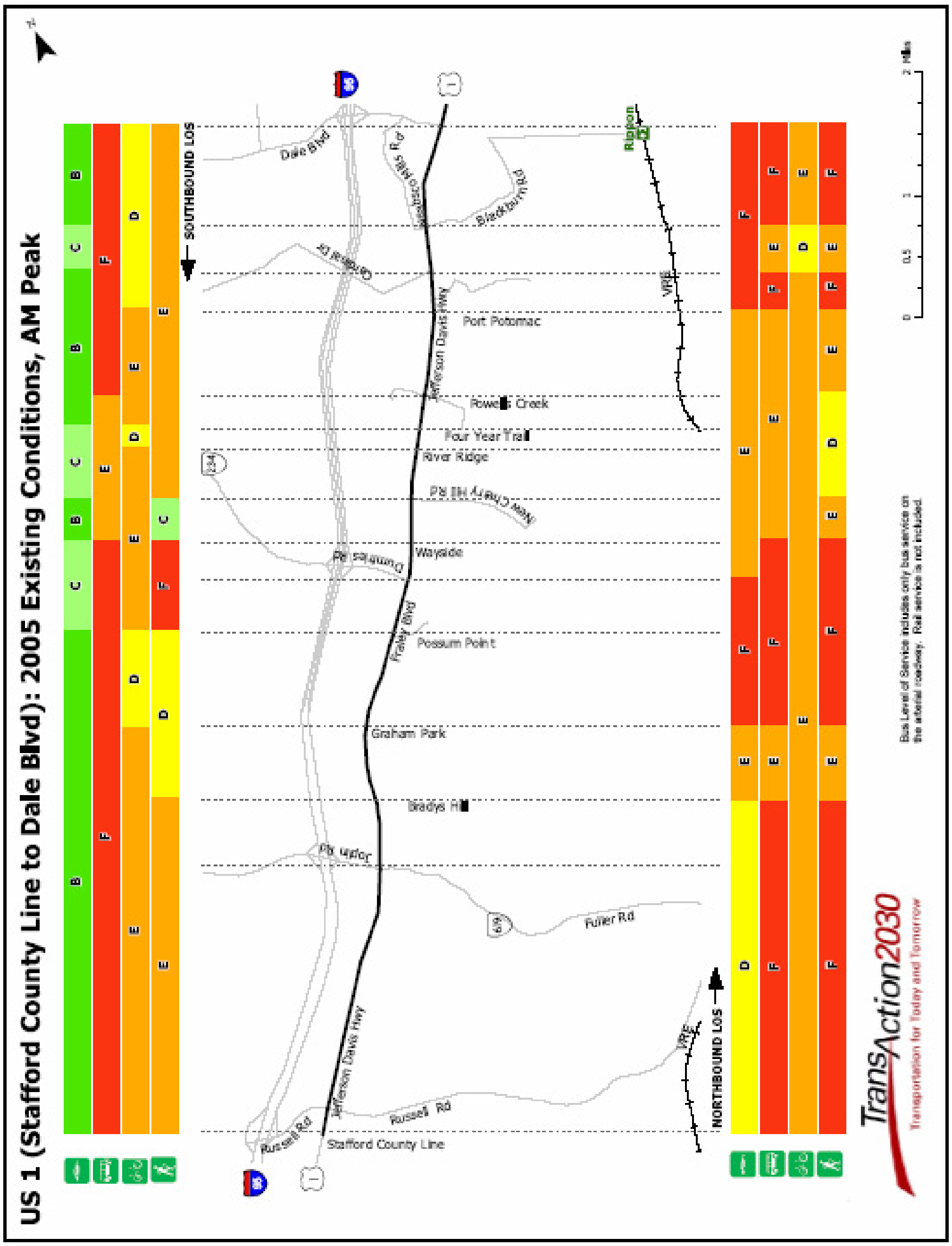
Figure 14   Beltway Multimodal LOS



US 1

For 2005 northbound US 1, auto LOS is mainly E and F. Transit LOS ranges throughout the corridor from A (approximately 20 percent) to F (approximately 20 percent). Bicycle LOS is mainly D and E. Pedestrian LOS varies throughout the corridor with significant areas of C through F.

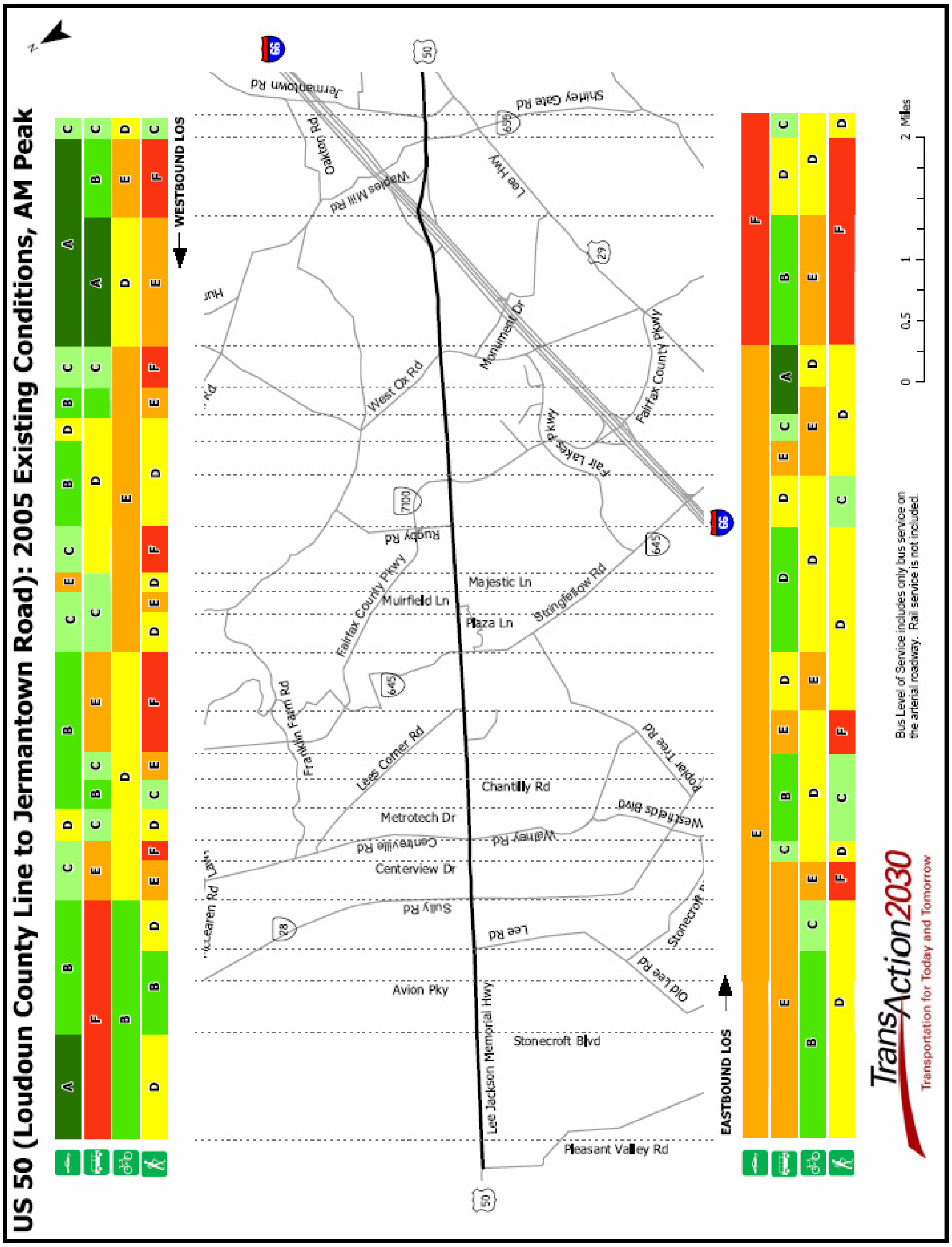
Figure 15 Route 1 Multimodal LOS



US Route 50

For 2005 eastbound US 50, auto LOS is E for almost the entire corridor, with the remaining segments rated F. Transit LOS varies in the corridor. Although LOS E represents the most common rating (approximately 30%), the majority of segments are D or better. Bicycle LOS is 50% LOS E with significant portions operating at D. The corridor's pedestrian LOS is mainly F with significant segments of D.

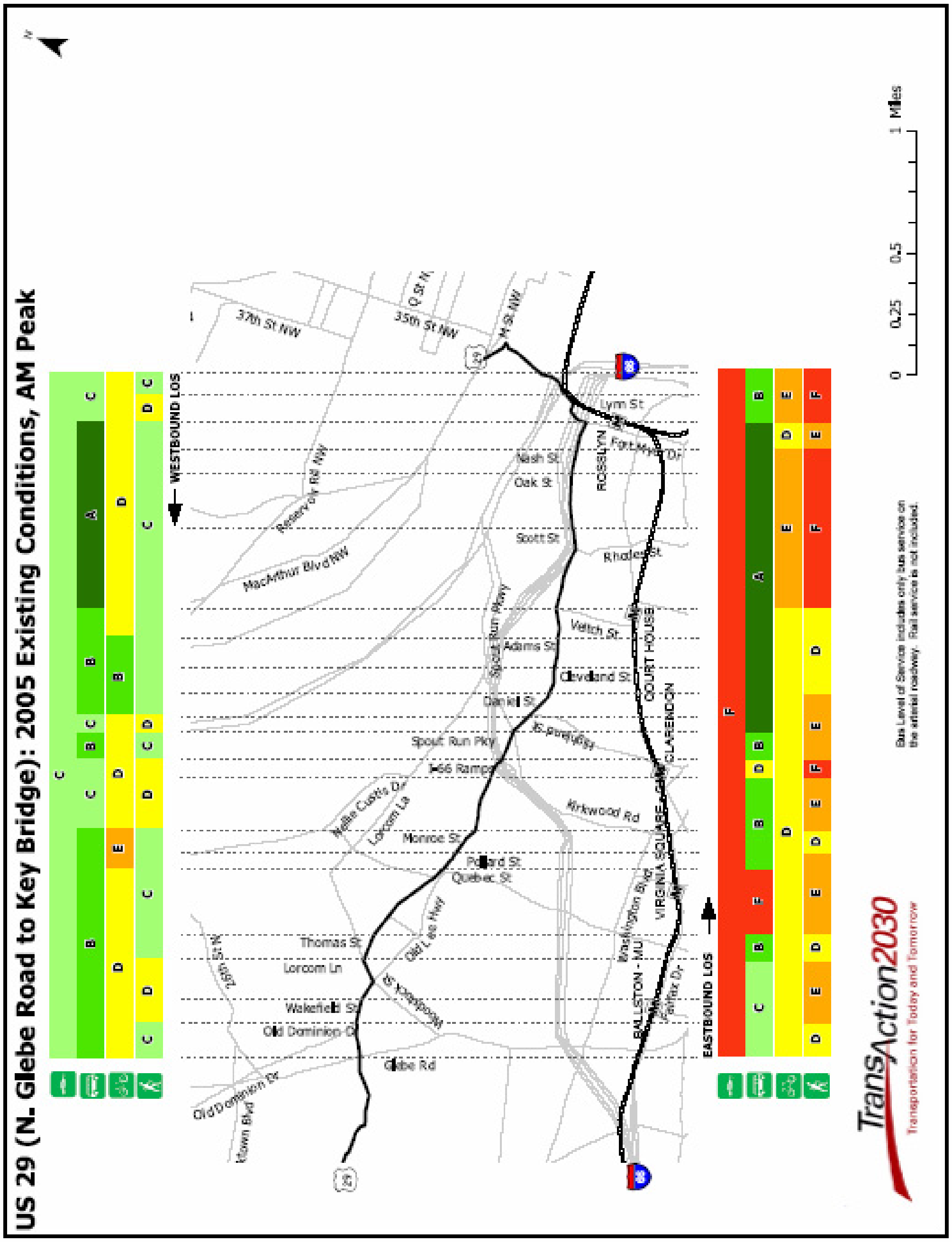
Figure 16 Route 50 Multimodal LOS



US Route 29

For 2005 eastbound US 29, LOS for auto is primarily F for approximately 85% of the corridor. Although about half of the corridor has a transit LOS of D or better, a significant number of segments show LOS F. Bicycle LOS for the corridor largely falls into three ratings: C, D, and E (each approximately 30%). Pedestrian LOS is mainly F with several portions of the corridor at LOS D.

Figure 17 Route 29 Multimodal LOS



3

TransAction 2030 System Evaluation

3.1 TransAction 2030 Projects

The projects that were evaluated for the Transaction 2030 Transportation Plan were the same projects that had been identified by the Northern Virginia 2020 Transportation Plan. The list of highway and transit projects that were in the 2020 Transportation Plan was screened for projects that had either been completed since the previous plan or added to the 2004 CLRP, in which case they were eliminated as a TransAction 2030 project. For example, the Dulles Rail project had ben added to the 2004 CLRP and is therefore not shown as a TransAction 2030 project. The list of TransAction 2030 trail projects was developed from a detailed project database supplied by VDOT that contained both CLRP projects and projects that weren't in the CLRP. Since the VDOT database of trail projects not in the CLRP contained approximately 170 separate projects, projects that were along the same roadway or trail were aggregated for the purposes of the prioritization exercise.

The projects listed below represent projects that were not in the 2004 CLRP and are therefore recommended for the TransAction 2030 Transportation Plan. They are listed in priority order.

Corridor 1: Dulles/VA 7

- Highway Projects
  - Widen VA 606 bridge (Baron Cameron Avenue) and VA 267 within Dulles Greenway ROW from 4 to 6 lanes
  - Widen VA 772 bridge (Loudoun County Parkway) and VA 267 within Dulles Greenway ROW from 4 to 6 lanes

- Reconstruct East Elden Street from Monroe Street to Herndon Parkway East
- Reconstruct Downtown Elden Street from Center Street to Monroe Street
- Reconstruct South Elden Street from Herndon Parkway to Sterling Road

- Transit Projects
  - Construct Light Rail in VA 7 corridor from Tysons Corner to Baileys Crossroads/Skyline

- Trail Projects
  - Construct a Trail along VA 7 from Leesburg to Alexandria
  - Construct a Trail along the Dulles Toll Road from Sully Road to Rte. 123
  - Construct a Trail in the Purcellville area along VA 690 (21st St.) from Main Street to W&OD Trail
  - Construct a Trail along VA 703 (Haycock Road) from Broad Street to I-66

Corridor 2: Tri-County/Loudoun County Parkway & VA 234/VA 659

- Highway Projects
  - Widen/Upgrade VA 234 (Manassas Bypass) from I-66 to VA 234 south of Manassas to 6 lanes
  - Widen Godwin Drive from Sudley Road to VA 28 from 4 to 6 lanes
  - Construct an interchange at VA 234 Bypass and Liberia Avenue/VA 3000

- Trail Projects
  - Construct a Trail along Loudoun County Parkway from John Mosby Highway to Ryan Road
  - Construct a Trail along Prince William Parkway from Nokesville Road to Dumfries Road
  - Construct a Trail along Tri-County Parkway from Braddock Road to Sudley Road
  - Construct a Trail along Godwin Drive from Nokesville Road to Sudley Road
  - Construct a Trail along Claiborne Parkway from Rte. 7 to Ryan Road
  - Construct a Trail along VA 659 (Belmont Ridge Road) from Harry Byrd Highway to Evergreen Mill Road

Corridor 3: VA 28

- Highway Projects
  - Widen Liberia Avenue from VA 28 to Norfolk Southern Railroad to 6 lanes
  - Construct VA 28 interchange at Frying Pan Road
  - Construct VA 28 interchange at New Braddock Road
  - Widen VA 28 from Dulles Toll Road to Route 606 to 8 lanes
  - Widen VA 28 from I-66 to Fairfax County line to 8 lanes
- Transit Projects
  - Construct VRE Service Extension from Manassas to Fauquier County Line (includes full extension)
  - Construct Light Rail on Route 28 from Manassas to Dulles Airport
- Trail Projects
  - Construct a Trail along VA 28 (Sully Road) from Walney Road to Dulles Toll Road
  - Construct a Trail along Atlantic Boulevard from Harry Byrd Highway to Church Road
  - Construct a Trail along VA 636 (Shaw Road) from W&OD Trail to Dulles Toll Road

Corridor 4: Prince William Parkway (VA 3000)

- Highway Projects
  - Widen the Prince William County Parkway to 6 lanes from Hoadly Road to I-95
- Transit Projects
  - Implement Priority Bus from Woodbridge to Manassas

Corridor 5: Fairfax County Parkway (VA 7100)

- Transit Projects
  - Implement Corridor-Wide Priority Bus Service
- Trail Projects
  - Construct a Trail along Hayfield Road from Manchester Road to Telegraph Road
  - Construct a Trail along Manchester Road from Beulah Street to Hayfield Road

Corridor 6: I-66/US 29/US 50

- Highway Projects
  - Widen I-66 from US 29 (Gainesville) to I-495 to 8 lanes and 2 HOV reversible lanes
  - Widen US 29 from I-495 to VA 7 to 6 lanes
  - Widen US 29 from Fauquier/Prince William County Line to Virginia Oaks Drive to 6 lanes
  - Construct an interchange on US 29 at US 15
  - Reconstruct US 29 turn lanes from Quincy Street to Lexington Street
  - Reconstruct US 50 - median barrier from Jackson Street to Fillmore Street
  - Reconstruct US 29 near the City of Fairfax to enhance priority movements at 6 intersections
  - Reconstruct I-66 Interchange at US 29 in Centreville (possible new ramp)
  - Reconstruct intersections on US 50 from I-66 to Western City Limits of Fairfax
  - Reconstruct I-66 interchanges at Route 28, Stringfellow Road, US 50, VA 123, and Nutley Street

- Transit Projects
  - Construct Metrorail along I-66 corridor from Vienna to Centreville
  - Construct VRE Service Extension from Manassas to Haymarket
  - Implement Express Bus Service on I-66 Corridor
  - Implement Priority Bus along US 50 from VA 659 relocated (Loudoun) to Glebe Road
  - Construct 2,450 additional parking spaces at VRE stations along the Manassas line

- Trail Projects
  - Construct a Trail along US 50 (Arlington Boulevard) from Wilson Blvd. to Four Mile Run Trail
  - Fill in two segments of the Trail on US 29 (Lee Highway) from Dixie Hill Road to Prosperity Blvd.
  - Construct a Trail along US 50 from Prosperity Blvd. to Rte. 7

Corridor 7: I-495 (Beltway)

- Highway Projects
  - Widen the Beltway to 8 unrestricted lanes plus four HOV or high occupant toll (HOT) lanes from Woodrow Wilson Bridge to American Legion Bridge
  - Reconstruct I-495 Interchanges at George Washington Memorial Parkway, Georgetown Pike, Dulles Toll Road, and US 50
- Transit Projects
  - Construct Metrorail Circumferential Line from Dunn Loring to Bethesda (Red Line)
  - Implement Corridor Wide Express Bus from Woodrow Wilson Bridge to American Legion Bridge
- Trail Projects
  - Construct Beltway Trail in Fairfax County from Dolley Madison Boulevard to Live Oak Drive
  - Construct VA 617 (Backlick Road Trail) from Lee Highway to Capital Beltway
  - Construct Backlick Run Trail from Backlick Road to past Clermont Avenue
  - Construct Alexandria-Local Trail along Eisenhower/Holland/Prince/Reinekers
  - Construct Potomac Heritage Trail/Mt. Vernon Trail from Northern End of Beltway Trail to Chain Bridge

Corridor 8: I-95/I-395/US 1

- Highway Projects
  - Construct an interchange at US 1 in on Rippon Boulevard/Dale Boulevard
  - Construct an interchange on US 1 at Fairfax County Parkway and at Huntington Avenue/Fort Hunt Road
  - Construct an interchange on VA 236 (Little River Turnpike) at Beauregard Street
  - Construct an entrance to I-95 low occupant vehicle (LOV) lanes at Franconia-Springfield Parkway
- Transit Projects
  - Construct a Transitway from Crystal City to Potomac Yard
  - Extend Metrorail from Springfield to Potomac Mills

- Construct 3,150 additional parking spaces at VRE stations along the Fredericksburg line

- Trail Projects
  - Construct a Trail along US 1 from Stafford County to I-95/495
  - Construct a local Trail on Arlington local streets along I-95 and US 1 corridor
  - Construct a local Trail on Alexandria local streets along I-95 and US 1 corridor
  - Construct a local Trail on Fairfax County local streets along I-95 and US 1 corridor
  - Construct Trail along Metrorail from Cameron Street to Crystal City
  - Construct a Trail along VA 611 (Telegraph Road) from S. Kings Highway to N. Kings Highway
  - Construct Capital Beltway Ramp Trail from I-95 to Route 1 (Richmond Highway)
  - Construct Potomac Heritage Trail from Wharton Drive to Jefferson Davis Highway
  - Construct a Trail along Potomac Parkway from Old Stage Coach Road to New Cherry Hill Road Trail

Other Major Improvements (Outside Corridors)

- Highway Projects
  - Construct VA 123 interchange at International Drive
  - Construct VA 123 interchange at Braddock Road
  - Construct a Western Transportation Corridor from I-95 in Virginia to I-270 in Maryland*
  - Widen US 50 from Middleburg to US 15 to 4 lanes*
  - Construct Eastern Potomac River Crossing from I-95 (Prince William/ Stafford County) to US 301 in Maryland
  - Reconstruct US 15 turn lanes at US 50

* Projects not in Loudoun Countywide Tranportation Plan

- Transit Projects
  - Construct Light Rail along Columbia Pike Corridor from Baileys Crossroads/Skyline to Pentagon
  - Implement Priority Bus Service along VA 236 from City of Fairfax to Alexandria

- Trail Projects
  - Construct South County East-West Trail from Manassas-Clifton Trail to I-395 (Edsall Road)
  - Construct a Trail along James Madison Highway from I-66 to New Road
  - Construct a Trail along John Marshall Highway from I-66 to Lee Highway
  - Fill in two segments of the Trail along US 50 from Pleasant Valley Drive to Sully Road
  - Construct a Trail along VA 620 (Braddock Road) from Guinea Road to Little River Turnpike
  - Construct a Trail along VA 236 (Little River Turnpike) from Wakefield Chapel Drive to Van Dorn Street
  - Construct a Trail along VA 123 (Ox Road) from Clifton Road to Gordon Boulevard
  - Construct a Trail along VA 784 (Dale Boulevard) from Delaney Road to US 1
  - Construct a Trail along VA 638 (Rolling Road) from South County East-West Trail to I-95
  - Construct a Trail along Gordon Boulevard from US 1 to Commerce Street
  - Construct Holmes Run Trail from Columbia Pike to Larston Drive
  - Construct a Trail along Minnieville Road from Dumfries Road to Spriggs Road
  - Construct Miscellaneous Trails in Arlington County
  - Construct Miscellaneous Trails in Fairfax County
  - Construct Miscellaneous Trails in Loudoun County
  - Construct Miscellaneous Trails in Prince William County
  - Construct Trail along VA 234 Bypass North (VA 705) from Nokesville Road to Evergreen Mill Road
  - Construct Trail along US 15 (James Monroe Highway) from Braddock Road to MD State Line
  - Construct Trail along VA 9 (Charles Town Pike) from Harpers Ferry Road to Harry Byrd Highway
  - Construct Trail along Interstate Bike Rte. 1 (Lorton Road) from US 1 to Ox Road
  - Construct Trail along Route 734 from US 50 to Harry Byrd Highway

- Construct Trail along VA 287 (Berlin Turnpike) from W&OD Trail to Brunswick Bridge
- Construct Trail along Manassas Clifton Trail from Rte. 28 to South County East-West Trail
- Construct Trail along Old Ox Road from Loudoun County Parkway to Herndon Parkway
- Construct Trail along VA 671 (Harpers Ferry Road) from Harpers Ferry Bridge (West Virginia) to Charles Town Pike
- Construct Trail along Fairview Avenue from Center Street to Prince William Parkway
- Construct Trail along Interstate Bike Route 1 (Aden Road) from Fleetwood Drive to Dumfries Road
- Construct Trail along Algonkian Parkway/Holly Knoll Road from Harry Byrd Highway to Atlantic Blvd.
- Construct Trail along Old Bridge Road from Prince William Parkway to Poplar Lane
- Construct Trail along Spriggs Road from Hoadly Road to Dumfries Road
- Construct Trail along Mt. Vernon Trail Extension/Potomac Heritage Trail to George Washington Memorial Parkway
- Construct Trail along US 50 from Fauquier County Line to Pleasant Valley Drive

3.2 System Level Performance Evaluation Criteria

A comprehensive set of system-level performance criteria was developed to evaluate the benefits of adding the TransAction 2030 Plan projects. These criteria were related to the transportation planning objectives established for this study and utilized data that was available from this study. The criteria described below were used to measure the performance of the entire transportation system; that is, all of the projects working together as a whole. The project team first looked at current conditions in 2005 and then evaluated conditions in 2015, 2025, and 2030. This Plan document will present the findings of The TransAction 2030 Plan network as compared to the 2005 and 2030 CLRP networks. The remainder of the interim year and 2030 CLRP+ results can be found in the Technical Appendix to this document.

The system-level performance criteria, keyed to the plan objectives, are described below.

Provide an Integrated Multimodal Transportation System

This objective looks at the locations and extent of facilities such as park-and-ride lots, rail and bus stations, bicycle trails and sidewalks and how heavily they are used. This information can be used to improve transfers between automobiles, bicycles, buses or Metrorail so the public can travel more easily to work, shopping or recreation.

1. Number of intermodal transfer stations (an intermodal transfer station is defined as a facility that facilitates transfers between travel means, such as park-and-ride lots, rail stations and bus stations)
2. Miles of bicycle and pedestrian trails
3. Park-and-ride lot level of service

Improve Personal Mobility

This objective compares the travel experience on each mode of transportation (auto, rail, bus, bike, and walking) to verify that the planned projects result in travel improvements for each mode.

1. Multimodal corridor level of service
2. Highway system performance
3. Screenline volume-to-capacity ratios
4. Transit passenger load level of service (estimates transit level of service based on passenger demand vs. available capacity)
5. Vehicle miles of travel by level of service by route type for each jurisdiction
6. Percent vehicle miles of travel by level of service category

Improve Personal Accessibility

This objective informs planners and decision-makers on the number of jobs that can be reached within 45 minutes of travel by both car and public transportation. It also looks at the number of jobs accessible to low-income persons within the same amount of travel time. An efficient transportation system will maximize the availability of the greatest number of jobs to the greatest number of people within a reasonable travel time. It is particularly important that the transportation system not marginalize transit-dependent persons by serving job locations only by auto travel.

1. Average number of jobs within 45 minutes of households in each jurisdiction via auto
2. Average number of jobs within 45 minutes of households in each jurisdiction via transit

3. Average number of jobs within 45 minutes of disadvantaged households in each jurisdiction via auto
4. Average number of jobs within 45 minutes of disadvantaged households in each jurisdiction via transit

Improve Transportation – Land Use Linkage

This objective looks at places of business, recreation and employment (activity centers) and the ways people get to those areas. A well-integrated land use and transportation system will minimize the miles people need to travel to get to work, school, run errands, and enjoy leisure activities. It will also maximize the number of those trips that people take on public transportation and non-motorized modes.

1. Activity center level of service – highway and transit
2. Transit service coverage level of service
3. Trips by mode and purpose between activity centers
4. Vehicle miles of travel per capita by jurisdiction
5. Percent transit and High Occupancy Vehicle (HOV) trips by activity center

Protect the Environment

Vehicle miles traveled (VMT) is an indicator of the amount of emissions released from motor vehicles and is used in determining the level of pollution in our air. A reduction in VMT on arterial and collector facilities generally improves air quality.

1. Vehicle miles of travel (VMT) by roadway facility type for each jurisdiction

3.3 System Performance for 2005, 2030 CLRP and TransAction 2030 Networks

3.3.1 Integrated Multimodal System

Table 3 presents a summary of the number of multimodal transfer stations found under the 2005, 2030 CLRP and TransAction 2030 Plan networks.

Table 3 Multimodal Transfer Station Summary

Transfer Stations	2005	2030 CLRP	2030 Plan
Metrorail Stations	20	31	41
VRE Stations	17	18	22
LRT/BRT Stations	0	0	54
P&R Lots	74	74	74
TOTAL	111	123	191

The TransAction 2030 Plan network provides a 72% increase in intermodal transfer stations over the current 2005 network. The number of Metrorail stations will double and the VA Route 7, VA Route 28, Crystal City-Potomac Yard Transitway, and the Columbia Pike light rail transit (LRT) or bus rapid transit (BRT) lines add up to 54 transfer stations.

Miles of Bicycle and Pedestrian Trails

According to the VDOT Northern Virginia Regional Bikeway and Trail Network Study, there are currently approximately 2600 miles of existing and funded trails in Northern Virginia. The 2030 CLRP will add approximately 45 miles to this total, an increase of 17%. The TransAction 2030 Plan includes an additional 600 miles of on-road and off-road trails resulting in a dramatic 100% increase in trail mileage.

Park-and-Ride Lot Level of Service

Park-and- ride lot usage and level of service improves under the TransAction 2030 Plan over the 2030 CLRP. Regional park-and-ride lot space utilization drops from 93% under the 2030 CLRP to 73% under the TransAction 2030 Plan. This drop is the result of a dramatically expanded transit system that diverts people from HOV modes.

Under the TransAction 2030 Plan, the following lots were projected to reach capacity before the end of the AM peak period:

- Columbia Pike/Four Mile Run in Arlington
- American Legion Post # 176 in Fairfax County
- Canterbury Woods Park in Fairfax County
- Parkwood Baptist Church in Fairfax County
- Springfield Mall – Macy’s Parking Deck in Fairfax County
- Springfield Methodist Church in Fairfax County
- Springfield Plaza in Fairfax County

- Springfield Plaza K-Mart in Fairfax County
- Sydenstricker/Hooes in Fairfax County
- US 29/Stone Road in Fairfax County
- St. Andrew's Presbyterian Church, Purcellville in Loudoun County
- Lake Ridge Commuter Lot in Prince William County
- Montclair Commuter Lot in Prince William County
- Prince William Parkway Lot in Prince William County
- US 1/VA 619 in Prince William County
- US 1/VA 234 in Prince William County

The number of park-and-ride lots that were projected to reach capacity dropped from 26 in 2030 CLRP and 19 in 2005 to 16 under the TransAction 2030 Plan. This was due to increased transit ridership in the major HOV corridors with implementation of the significant high capacity transit projects in the TransAction 2030 Plan. Previous studies in the region have shown that HOV and transit are competing modes in the major corridors and the significant transit projects are projected to reduce HOV demand over 2030 CLRP conditions. HOV demand is a primary determinant of park-and-ride lot usage.

3.3.2 Personal Mobility

Multimodal Corridor Level of Service

The results presented below discuss the general trend of modal conditions within the region, in the peak direction during the weekday a.m. peak hour, rather than focusing on specific locations on specific highways where LOS may go up or down. The maps in the Technical Appendix provide the specific LOS details for a given section of roadway. Similar results would be expected in the opposite direction during the weekday p.m. peak hour.

2030 CLRP

Automobile LOS on the radial arterial routes (US 1, US 29, US 50, and Virginia 7) was consistently worse during the weekday a.m. peak hour, compared to 2005, with all of these routes being congested in the peak direction (LOS F), except for sections of US 1. The arterials paralleling the Beltway (Virginia 123, Virginia 650, Virginia 644, and Virginia 617) also experienced mostly LOS F conditions.

As is the case in 2005, the region's circumferential routes outside the Beltway operated much better than the radial routes during peak hours, with only isolated locations of congestion. Auto LOS values generally were the same, or one grade lower, in 2030 than in 2005. Virginia 28 experienced congestion in the vicinity of I-66, and Virginia 234 experienced congestion in the section south of Manassas between the bypass junction and Lake Jackson.

Portions of the radial arterials passing through outlying communities such as Purcellville, Leesburg, Dumfries, and Woodbridge experienced better bus LOS, reflecting local bus service improvements. Bus LOS also improved on US 29 and US 50 east of Fairfax, and on Virginia 7 in the Tysons Corner area. However, LOS dropped along Virginia 7 between Virginia 28 and the Dulles Access Road, where pedestrian access to bus stops was made more difficult due to increased automobile volumes.

Bus LOS on the Beltway arterials improved north of I-66, but remained the same elsewhere. The outer circumferential arterials continued to have no through bus service (or no bus service at all). However, local bus service improvements resulted in improved bus LOS on Virginia 28 in the Sterling, Chantilly, and Manassas areas, and on Virginia 234 in the Manassas and Dumfries areas.

Roadway improvements to sections of the radial arterials that included bicycle facility improvements resulted in some noticeable improvements in bicycle LOS. US 1 south of Alexandria improved from mostly LOS E/F to mostly LOS B, US 50 improved to LOS B/C between Fairfax and the Beltway, US 29 improved to LOS B between Centreville and just west of Seven Corners, and Virginia 7 had bicycle LOS improvements in Purcellville, in Leesburg, and between Dranesville and Tysons Corner. Portions of the radial arterials without improvements had their bicycle LOS remain the same, compared to 2005, or drop, in sections where automobile volumes increased substantially (for example, Virginia 7 between Virginia 28 and Dranesville). Bicycle LOS on the circumferential arterials generally stayed the same, with a few areas with lower LOS values where automobile volumes increased substantially.

Pedestrian facility improvements resulted in improved pedestrian LOS values, compared to 2005, on the following roadways: US 1 from Woodbridge south, near Woodlawn, and in Alexandria; on US 29 from I-66 through the Manassas Battlefield, and from Centreville to the Beltway; and on US 50 from I-66 to Seven Corners. Other sections stayed the same, or had lower LOS scores, depending on the extent to which automobile volumes increased (e.g., US 29 from Bull Run to Centreville). Pedestrian LOS results for the circumferential arterials were generally the same as 2005, with a few areas where increased automobile volumes resulted in lower pedestrian LOS. However, pedestrian LOS improved along Virginia 28 from south of Lake Jackson through Independent Hill and on scattered sections of the Beltway arterials.

TransAction 2030 Plan

Automobile LOS on the radial arterial routes (US 1, US 29, US 50, and Virginia 7) was consistently worse during the weekday a.m. peak hour, compared to 2005, with all of these routes being congested in the peak direction (LOS F), except for sections of US 1. The arterials paralleling the Beltway (Virginia 123, Virginia 650, Virginia 644, and Virginia 617) also experienced mostly LOS F conditions.

Portions of the radial arterials passing through outlying communities experienced better bus LOS, reflecting local bus service improvements. Bus LOS along US 1 in Dumfries and Woodbridge also improved over the 2030 CLRP scenario. Bus LOS improved along US 29 in the Haymarket area and between Centreville and Falls Church, and was improved along nearly all of US 50 west of Glebe Road. Bus service along Virginia 7 worsened in the Tysons Corner area, reflecting new bus routings to serve new Metrorail stations. Bus LOS also dropped along Virginia 7 between Virginia 28 and the Dulles Access Road, where pedestrian access to bus stops was made more difficult due to increased automobile volumes.

Bus LOS on the Beltway arterials improved north of I-66 (to a greater extent than the 2030 CLRP scenario), from I-66 to Springfield, and in Alexandria, but also worsened between Franconia and Alexandria. The outer circumferential arterials continued to have no through bus service (or no bus service at all). However, local bus service improvements resulted in improved bus LOS on Virginia 28 in the Sterling, Chantilly, and Manassas areas, and on Virginia 234 in the Manassas and Dumfries areas. These improvements resulted in better bus LOS than in the 2030 CLRP scenario.

Bicycle LOS changes under the TransAction 2030 Plan scenario were generally similar to the 2030 CLRP scenario. The exceptions were US 29, where bicycle LOS also improved in the Haymarket and Falls Church areas; Virginia 659, where bicycle LOS generally improved by one LOS grade over its entire length; and US 50, where the LOS dropped significantly west of Chantilly.

Pedestrian LOS changes under the TransAction 2030 Plan scenario were generally similar to the 2030 CLRP scenario. The exceptions were US 29, where LOS also improved in Falls Church; Virginia 659, where LOS generally improved by one LOS grade over its entire length; US 50, where the LOS was worse west of Chantilly; Virginia 7, which also improved between Dranesville and Tysons Corner; and the Beltway arterials, which saw scattered improvements.

Highway System Performance

Figures 18, 19, and 20 show highway system performance under the 2005, 2030 CLRP and TransAction 2030 Plan networks. The results show dramatic improvement over 2030 CLRP conditions for the Transportation 2030 Plan network. Highway mileage operating under one hour or more of stop-and-go conditions under the 2030 CLRP network drops by approximately two-thirds with the addition of all TransAction 2030 highway and transit projects as highway and transit capacity is increased.

Figure 18 2005 Highway System Performance

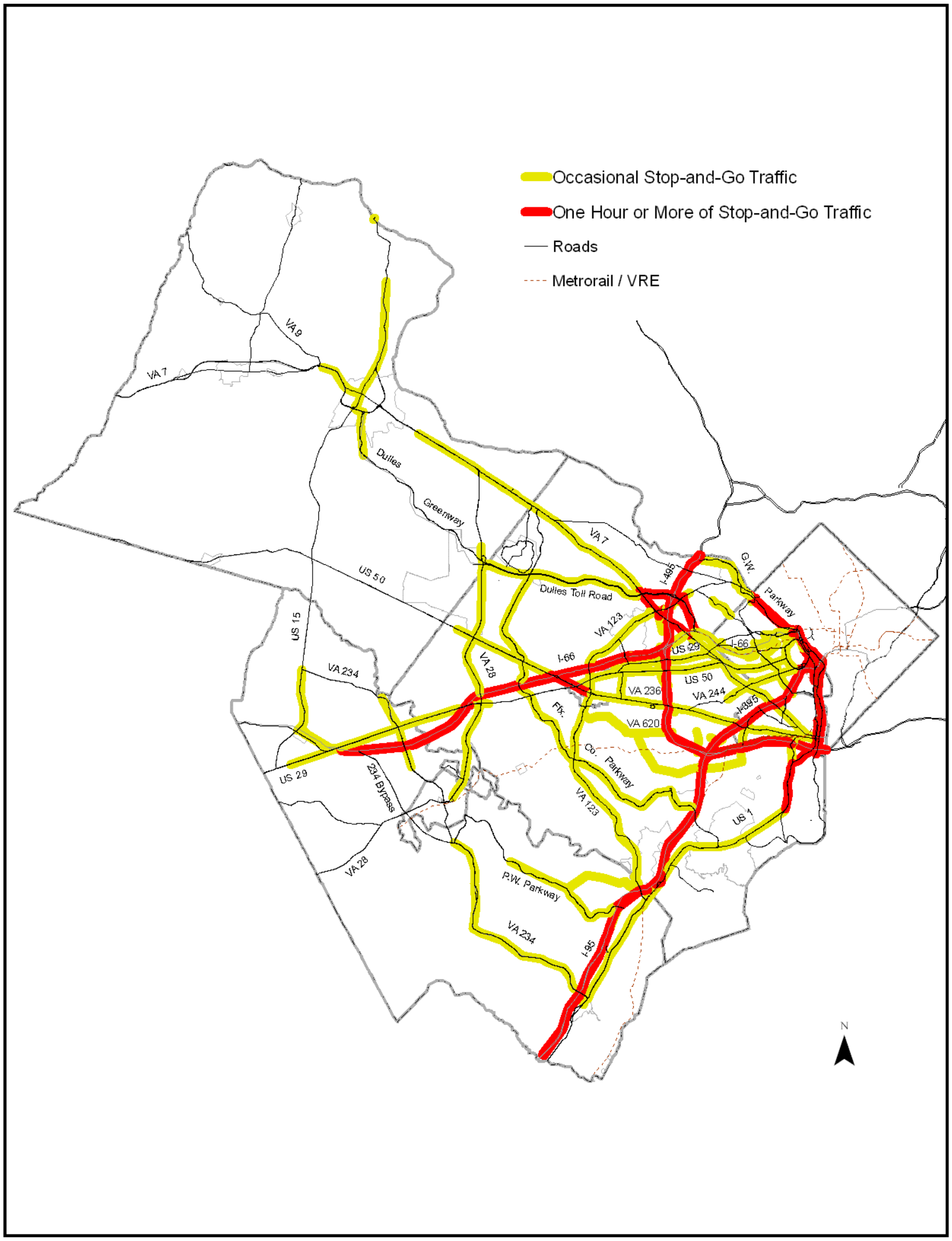


Figure 19 2030 CLRP Highway System Performance

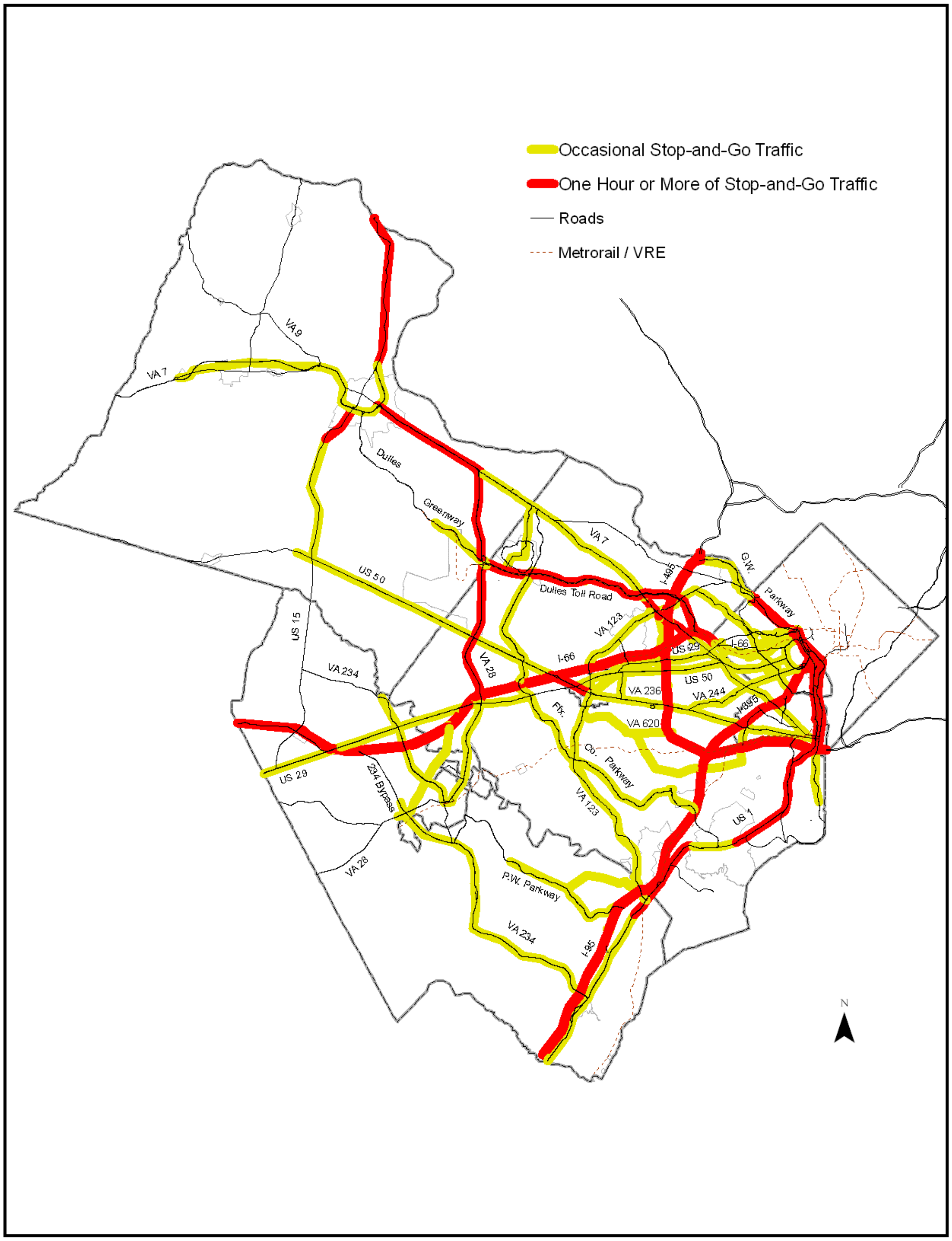
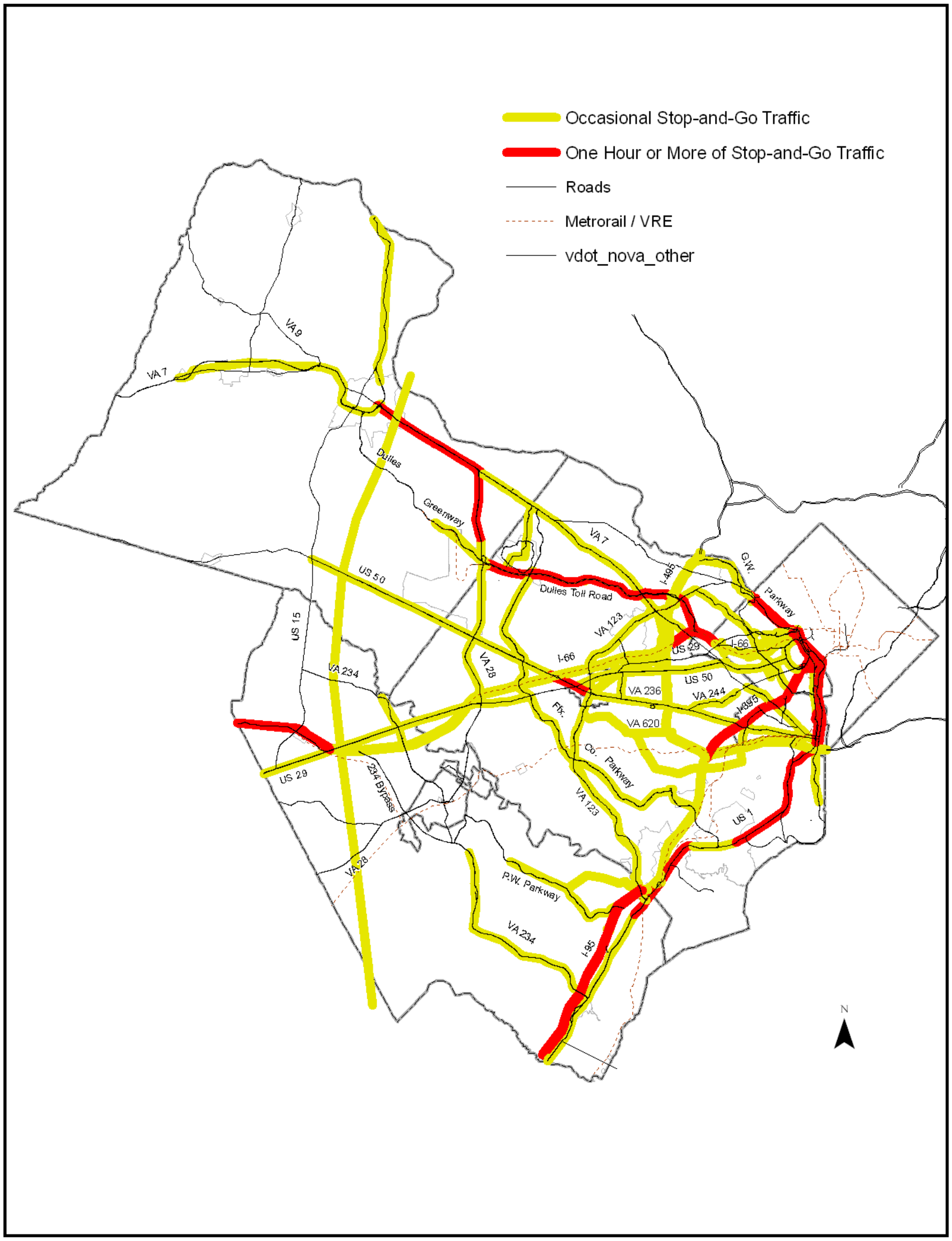


Figure 20 TransAction 2030 Highway System Performance



Screenline Volume-to-Capacity (V/C) Ratios

The ratio of vehicular volume to roadway capacity (V/C) is a principal way to measure roadway congestion. Based on ranges of V/C ratio, LOS is further estimated and used to assess the operational service of roadway segments. A grade system of LOS from A to G and associated V/C ranges for freeways and arterials is shown in Table 4. It should be noted that different from traditional Highway Capacity Manual (HCM) LOS, the capacity used in this study is LOS C capacity. LOS C represents conditions where travel speed is generally acceptable and consistent. Therefore, a V/C ratio of 1.00 represents an acceptable LOS C. LOS E, and its assocated V/C ratios in Table 4, represents the condtion where a roadway is accommodating its maximum throughput. LOS E and LOS G represent over capacity conditions with associated travel speed declines and congestion. LOS A to LOS D indicates conditions where traffic flow on roadways is smooth with acceptable speed.

Table 4 Grade System of LOS from A to G and Associated V/C Ranges for Freeways and Arterials

Level of Service	Volume-to-Capacity Ratio (V/C)	
	Freeways	Arterials
A/B	0 – 0.809	0 – 0.929
C	0.81 – 1.159	0.93 – 1.079
D	1.16 – 1.389	1.08 – 1.209
E	1.39 – 1.509	1.21 – 1.339
F	1.51 – 1.999	1.34 – 1.999
G	2.00+	2.00+

The same set of 43 cutlines, that was identified in the 2020 Transportation Plan, was adopted in this study. Each cutline normally crosses or cuts a minimum of three facilities. These cutlines were further grouped into 14 subregional screenlines, as shown in Figure 21, representing major corridor or environmental barriers such as rivers or steams in the area. The roadway link and name reference for each screenline can be found in the Technical Appendix. All the roadways that intersect with these screenlines were identified in the MWCOG models and V/C ratios were calculated based on associated volume and capacity.

The V/C ratios of these 14 subregional screenlines are provided in Table 5. Screenline V/C ratios under the TransAction 2030 Plan generally decrease relative to 2030 CLRP conditions. All of the screenlines in Table 5 have a V/C ratio of approximately 1.0 (LOS C), which indicates acceptable and stable travel speeds on the roadways, except for screenline XI, which has a V/C ratio between 1.4 and 1.7 (LOS E or F) indicating the facility is approaching its capacity. Screenline XI is the Potomac River that separates Virginia from Washington, DC and Maryland.

Figure 21 Subregional Screenlines

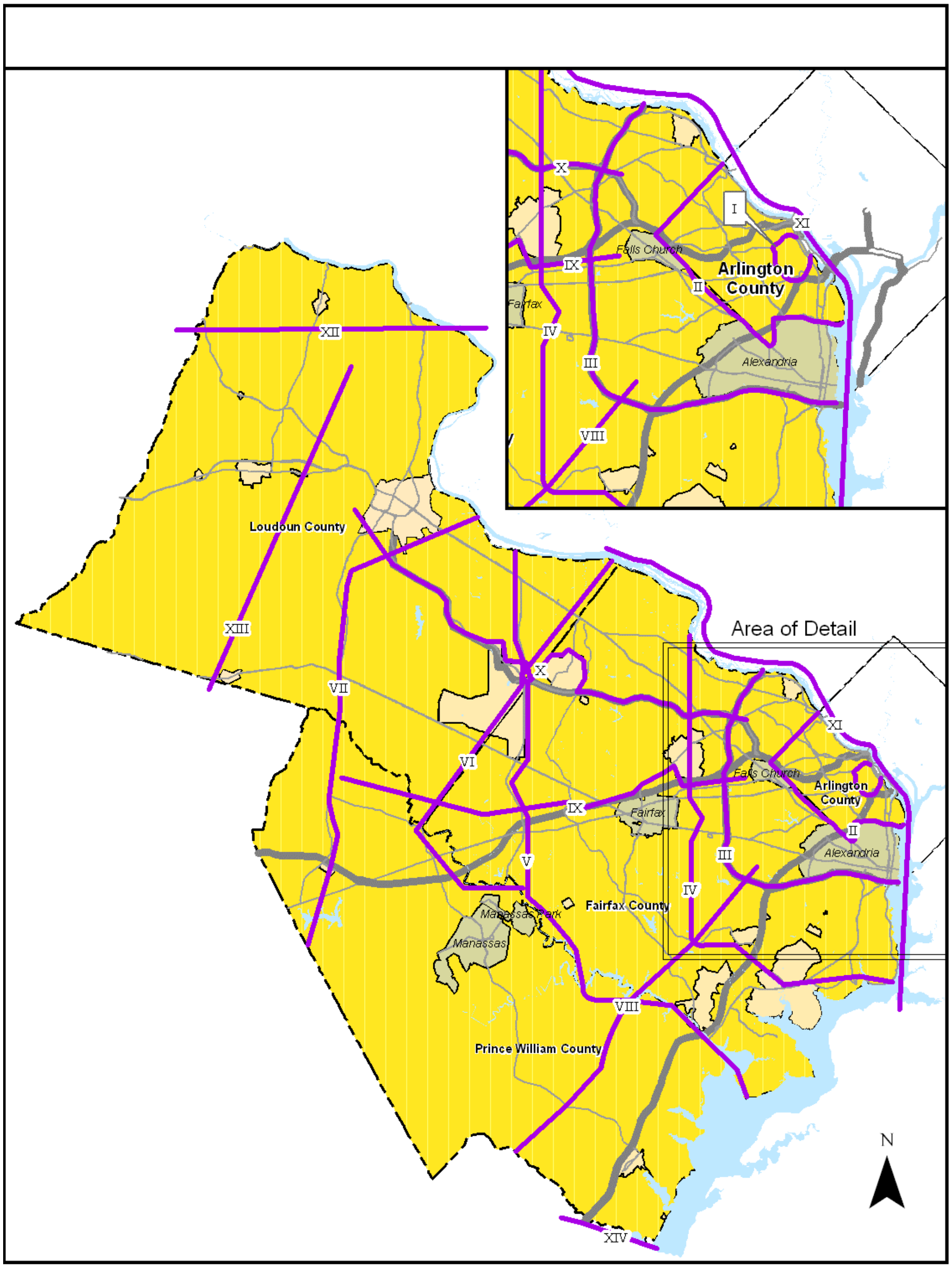


Table 5 V/C Ratios of 14 Subregional Screenlines

Screenline	2005	2030 CLRP	2030 Plan
I	1.07	1.14	1.06
II	1.01	1.05	0.97
III	1.16	1.17	1.12
IV	0.82	0.89	0.86
V	0.97	1.09	1.06
VI	0.72	0.95	0.99
VII	0.74	0.98	1.01
VIII	0.92	0.98	0.94
IX	1.18	1.12	1.09
X	0.86	1.08	1.06
XI	1.71	1.59	1.43
XII	0.57	1.01	0.84
XIII	0.47	0.83	0.83
XIV	1.04	1.11	1.11
Sum	0.99	1.09	1.04

Transit Passenger Load Level of Service

Virginia Railway Express (VRE)

VRE passenger load LOS under the 2005, 2030 CLRP and Transaction 2030 Plan conditions is shown in Figures 22, 23, and 24. The LOS results under the TransAction 2030 Plan network are very similar to the 2030 CLRP results, with the exception that the Manassas Line goes from LOS C under the 2030 CLRP network to LOS D between the Rolling Road and Alexandria stations under the TransAction 2030 network. This is due to increased ridership on the Manassas Line caused by the extensions to Nokesville and Haymarket. The extension from Manassas to Haymarket remains a constant LOS A.

The Fredericksburg Line shows LOS A to LOS B conditions between south of Quantico and Alexandria, with a degradation to LOS C between Alexandria and Crystal City. The most significant finding of the Transaction 2030 Plan network is the potential capacity issues that VRE may face on the Manassas Line if projected LOS D conditions in 2030 between Rolling Road and Alexandria degrade to LOS E or LOS F as demand increases in the out years.

Figure 22 2005 VRE Passenger Load LOS

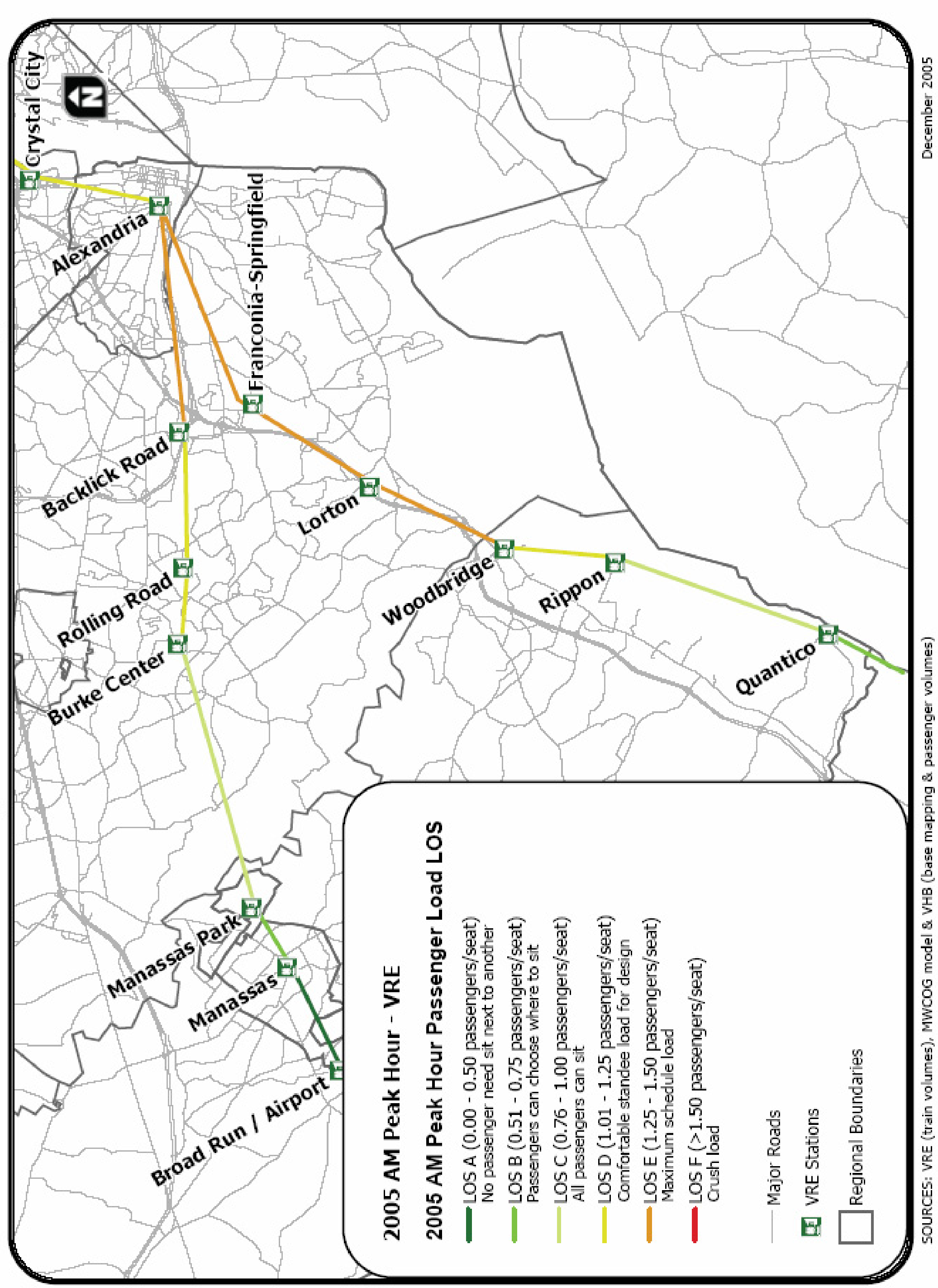


Figure 23 2030 CLRP VRE Passenger Load LOS

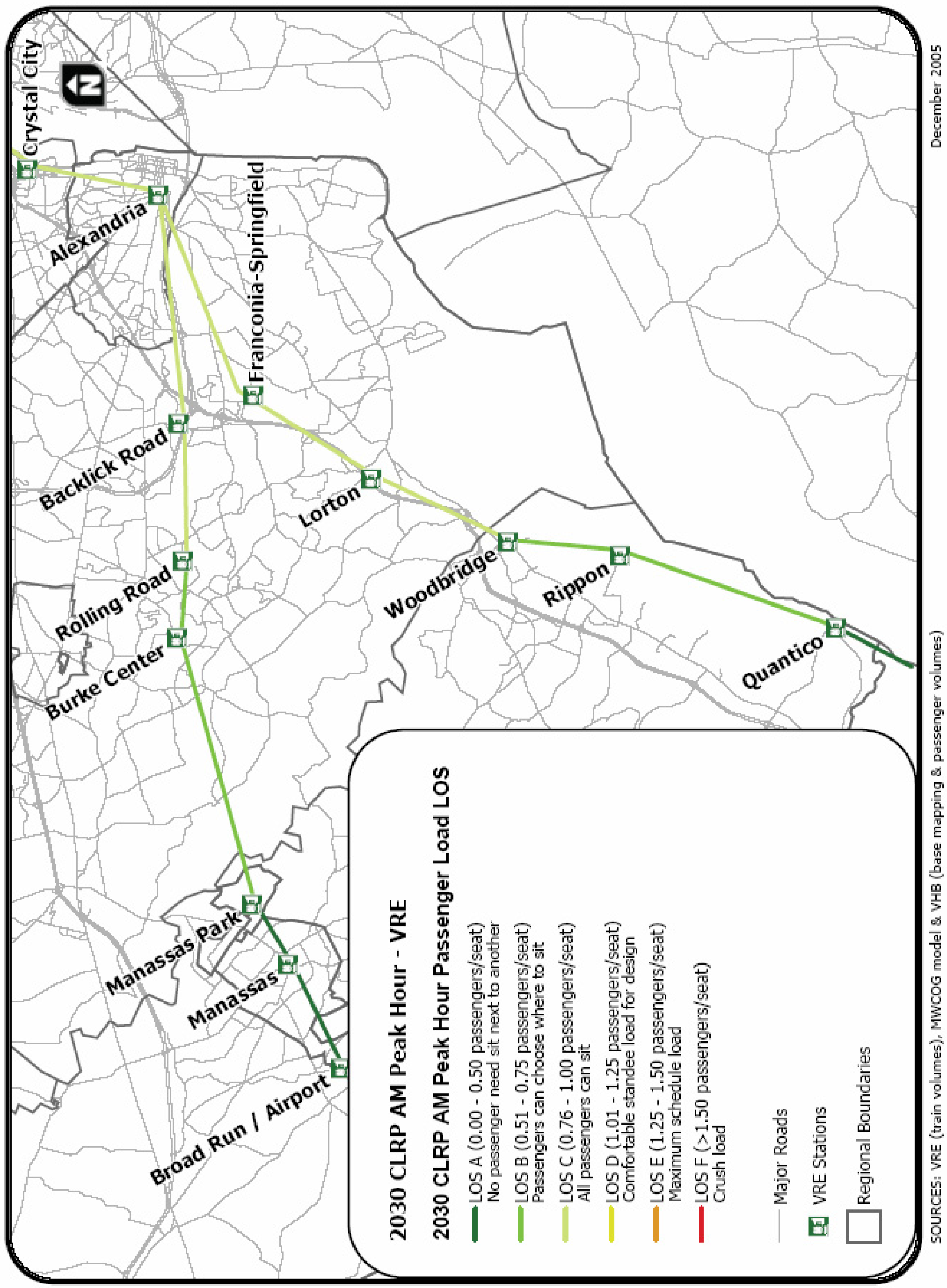
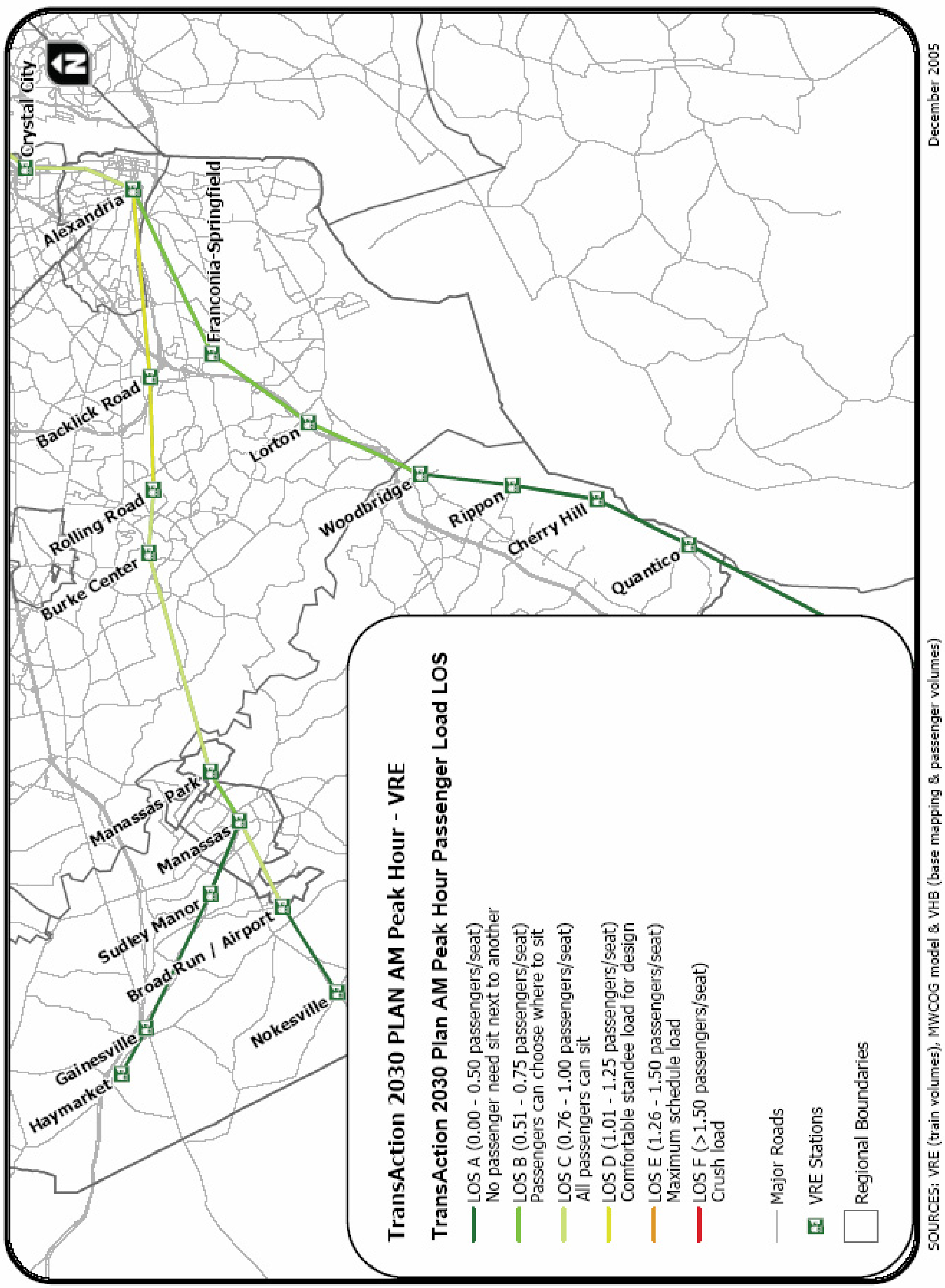


Figure 24 TransAction 2030 VRE Passenger Load LOS



Metrorail

Metrorail operating conditions remain constant along the Dulles Corridor and Orange lines under the TransAction 2030 Plan network as compared to the 2030 CLRP network. As a result of significant transit ridership growth, both the CLRP and TransAction 2030 networks show worsening crowding conditions on the segments into downtown D.C., as compared to 2005. Assessment is needed to understand capacity constraints and further identify improvements in support of ridership growth. Without additional improvements to capacity, the Blue Line extension in the TransAction 2030 Plan will affect LOS on the existing Blue Line segments.

Metrorail passenger load LOS under the 2005, 2030 CLRP and TransAction 2030 Plan networks are shown in Figures 25, 26, and 27.

Bus

Figures 28 through 30 show bus passenger load LOS by roadway link under 2005, 2030 CLRP and 2030 Plan conditions. The route miles with a given bus LOS under the 2030 CLRP scenario are as follows:

- LOS A: 1,227 miles (81%)
- LOS B: 130 miles (9%)
- LOS C: 65 miles (4%)
- LOS D: 27 miles (2%)
- LOS E: 18 miles (1%)
- LOS F: 51 miles (3%)

The number of route miles with standing passengers (LOS D to F) drops by 23% under this scenario, from 125 miles in 2005 to 96 miles in 2003.

The route miles with a given bus LOS under the TransAction 2030 Plan scenario are as follows:

- LOS A: 1,340 miles (85%)
- LOS B: 107 miles (7%)
- LOS C: 69 miles (4%)
- LOS D: 25 miles (2%)
- LOS E: 16 miles (1%)
- LOS F: 29 miles (2%)

The number of route miles with standing passengers (LOS D to F) drops by 44% under this scenario, from 125 miles in 2005 to 70 miles in 2003.

Figure 25 2005 Metrorail Passenger Load LOS

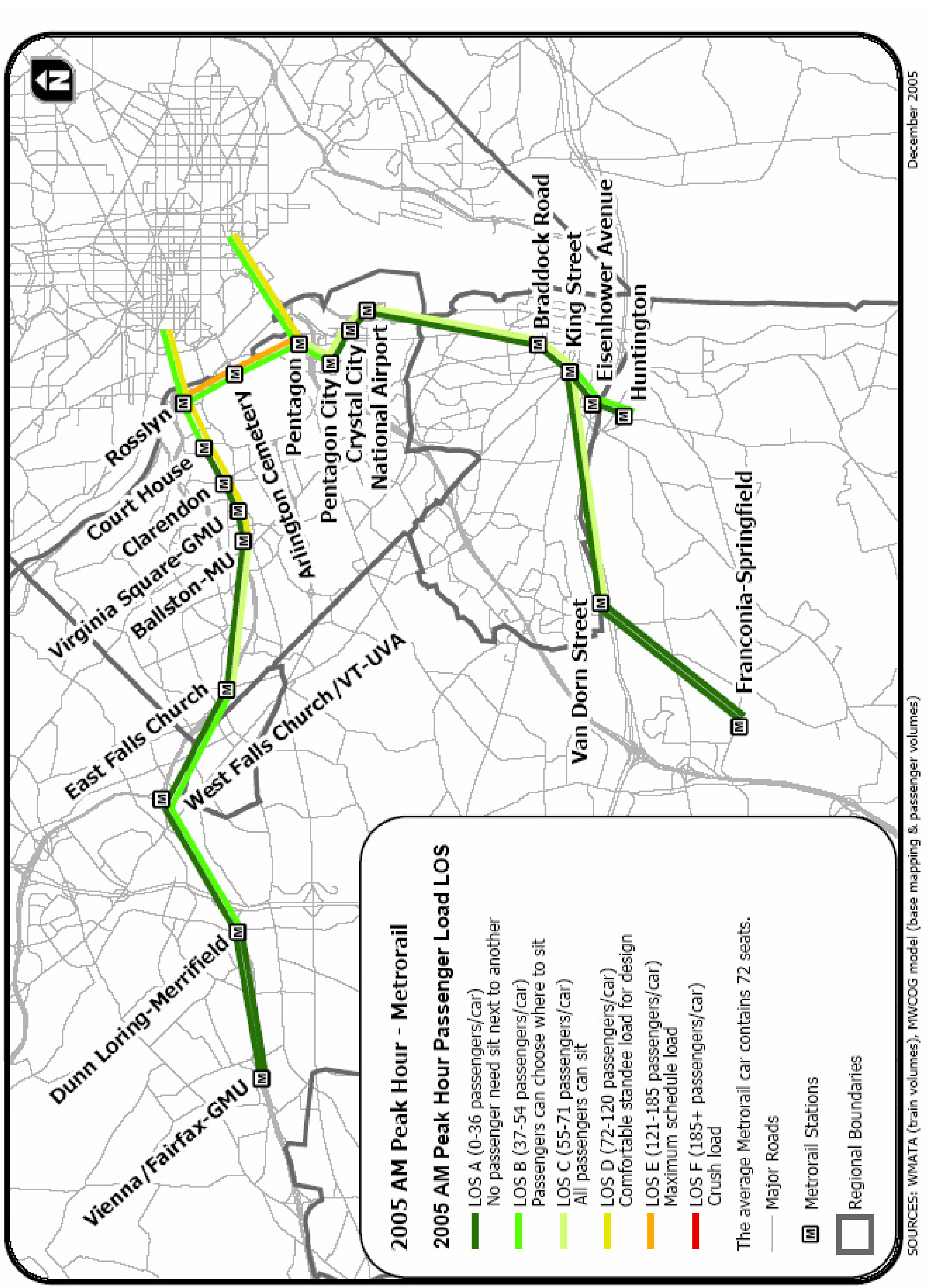


Figure 26 2030 CLRP Metrorail Passenger Load LOS

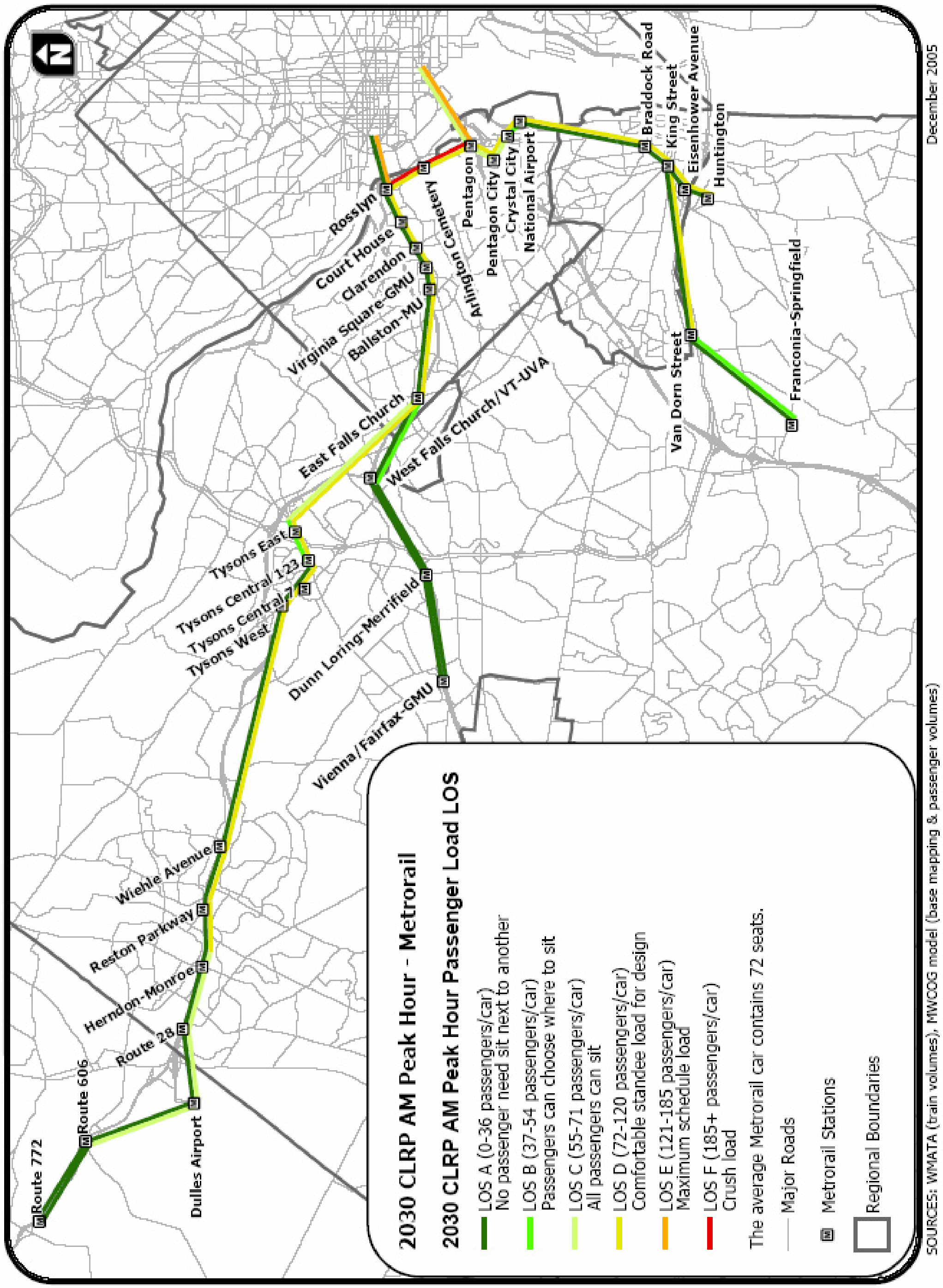


Figure 27   TransAction 2030 Metrorail Passenger Load LOS

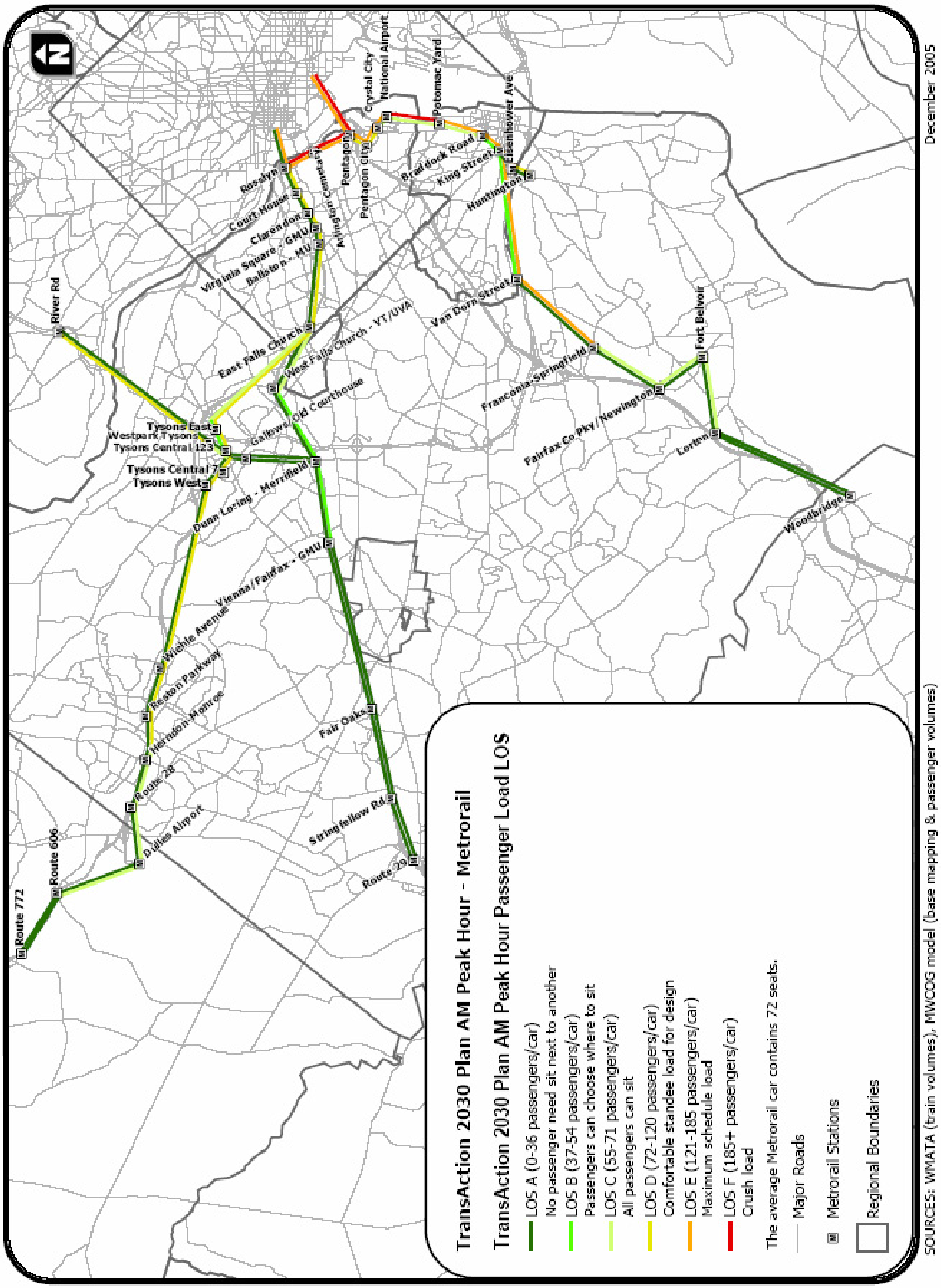


Figure 28 2005 Bus Passenger Load LOS

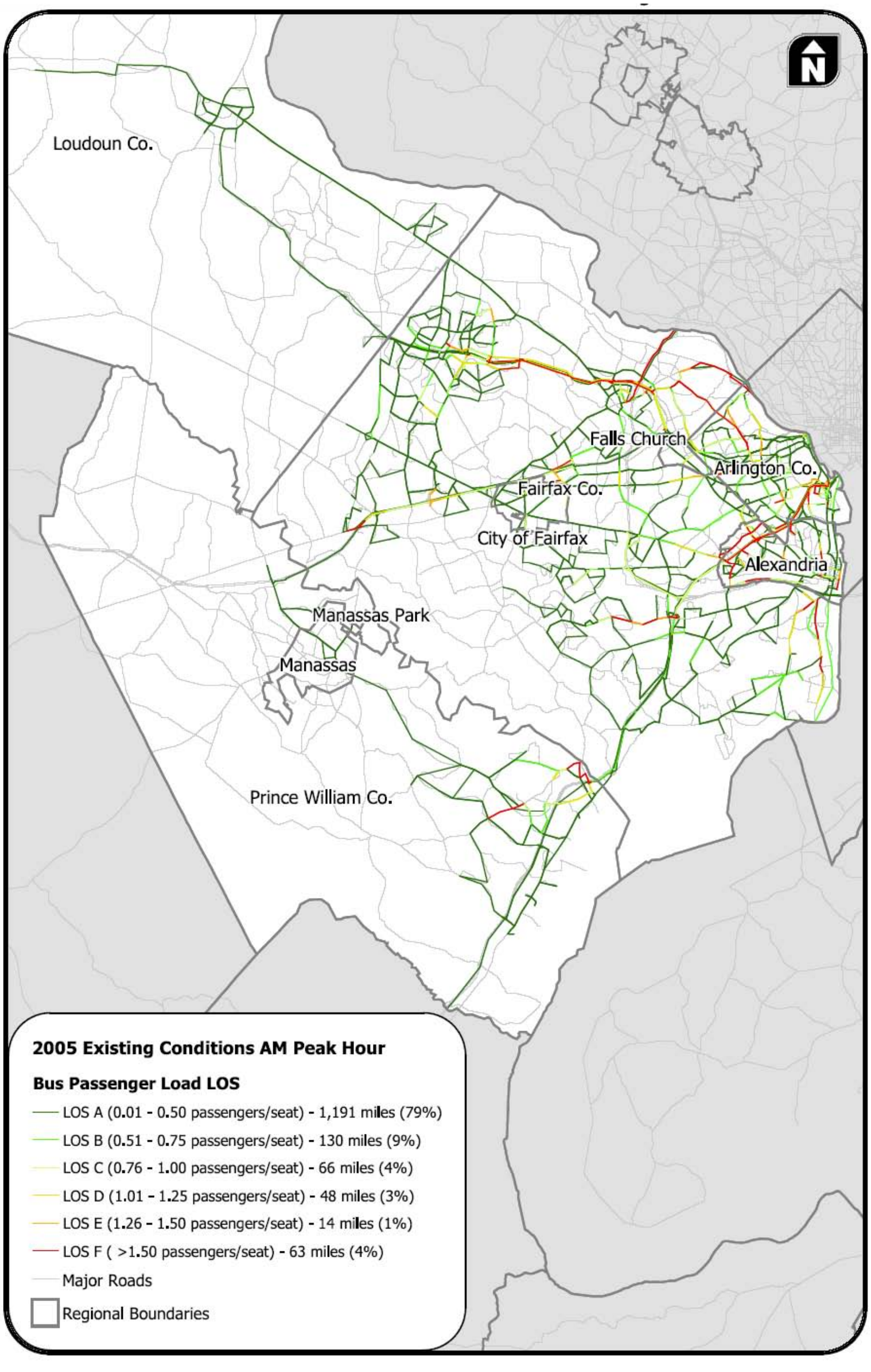


Figure 29   2030 CLRP Bus Passenger Load LOS

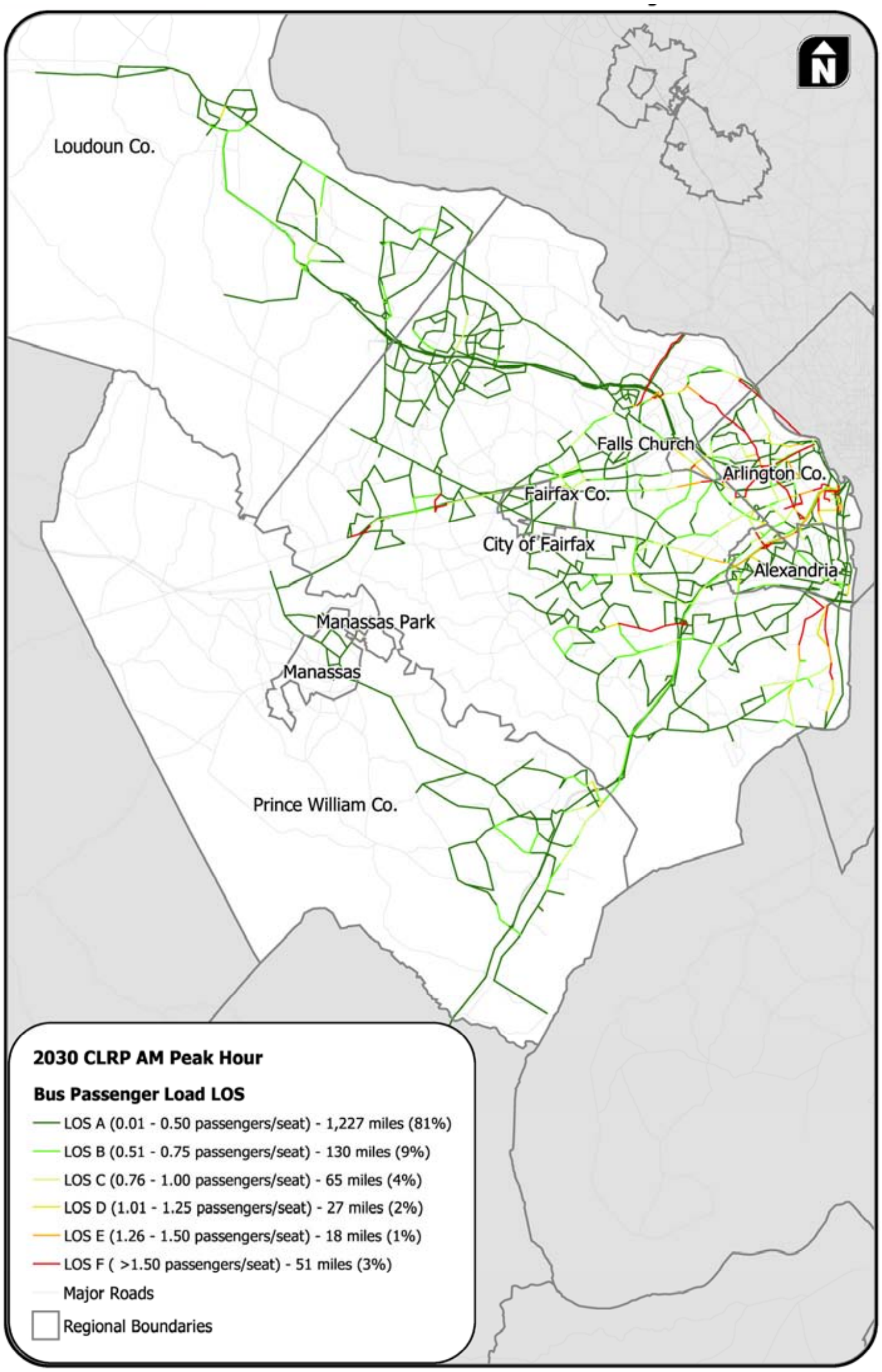
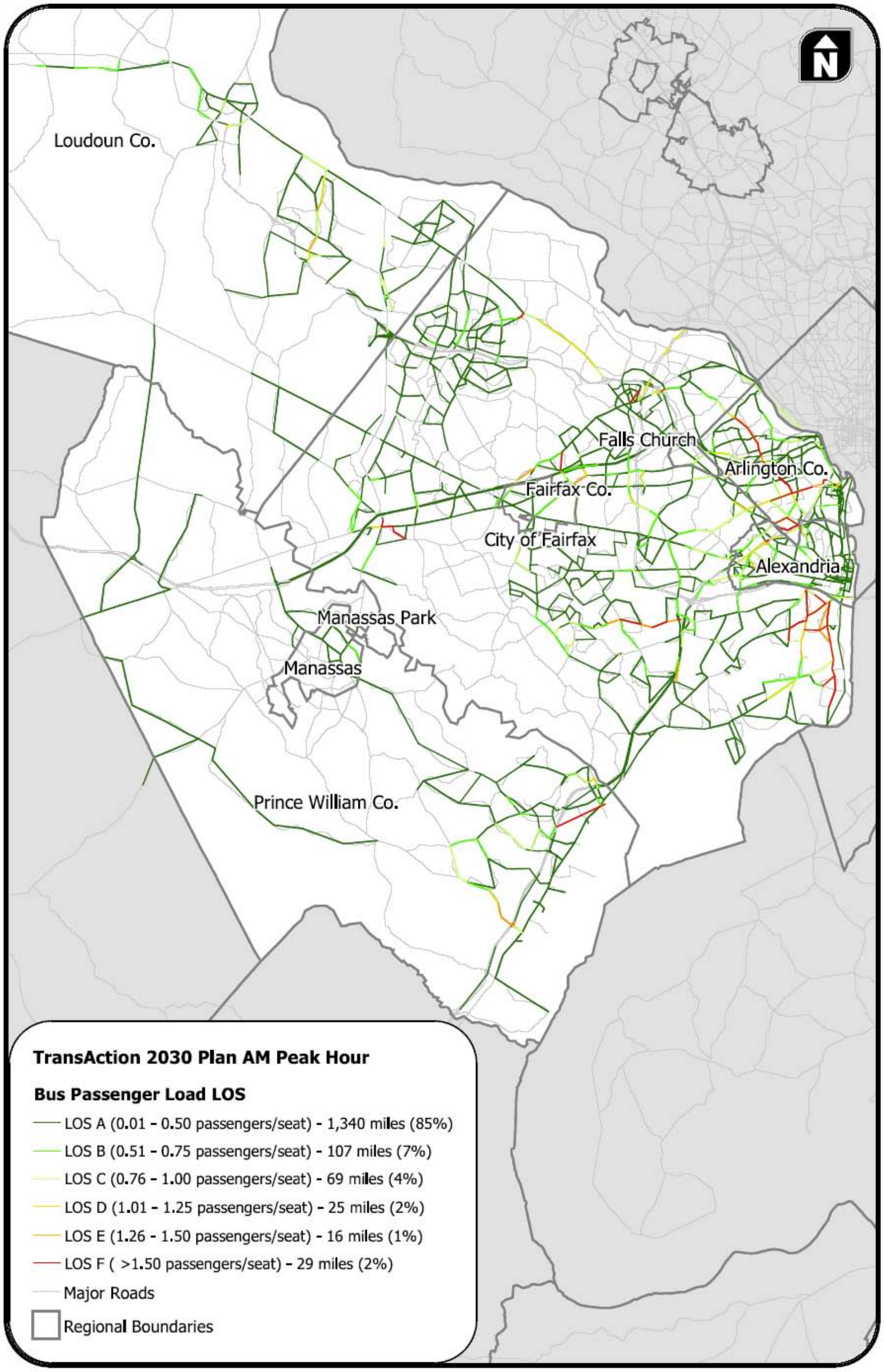


Figure 30 TransAction Plan Bus Passenger Load LOS



LRT

The TransAction 2030 Plan includes new LRT lines. Passenger load LOS D for light rail represents a reasonable standing load, LOS E represents an achievable, but highly crowded load, and LOS F represents crush loading, with passengers left behind at stations. LOS E conditions would occur on the Manassas-Dulles line in two short segments during the weekday a.m. peak hour: Manassas to Mathis Drive & Liberia, and Lee Highway to Westfields Boulevard. LOS E and F conditions are not forecasted to occur on the Columbia Pike-Leesburg Pike line. Figure 31 shows LOS results for the light rail lines.

Percent VMT by LOS Category

Percent VMT by level of service category is an important measure of personal mobility. A comparison of percent VMT by LOS category was performed for each Northern Virginia jurisdiction for the three scenarios, as shown in Figures 31 through 36. A shift of VMT between 2005 and 2030 from LOS A/B to F/G was observed in Loudoun and Prince William Counties, which is an expected change given the fact that vehicle trips will increase by approximately 90% and 30%, respectively, in these two counties in 2030 from current data. For the remaining three jurisdictions, the TransAction 2030 Plan outperforms the 2030 CLRP since a smaller proportion of VMT falls into LOS G, which indicates stop and go conditions for one hour or more.

Figure 31 TransAction 2030 Plan AM Peak Hour Light Rail Passenger LOS

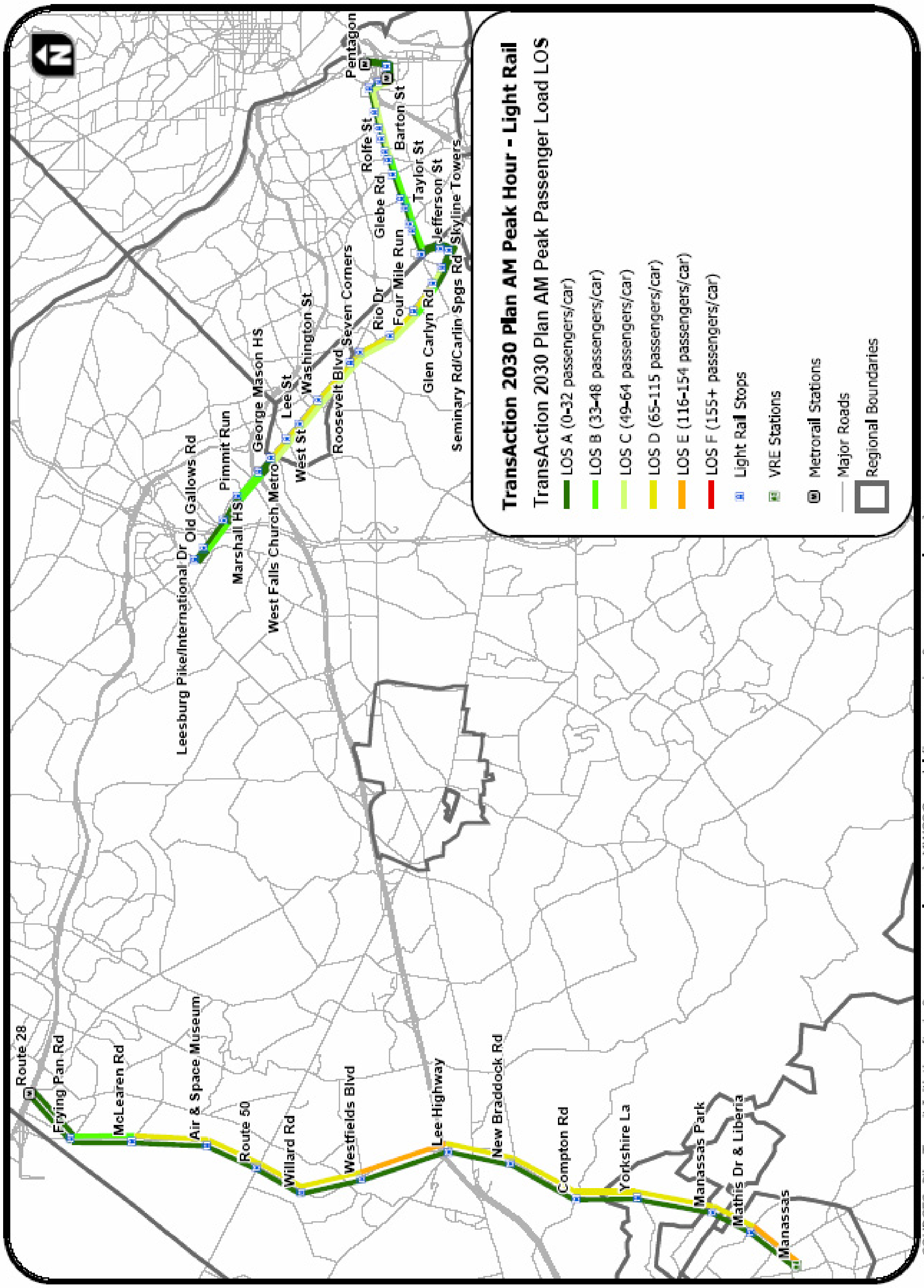


Figure 32 Fairfax County % VMT by LOS

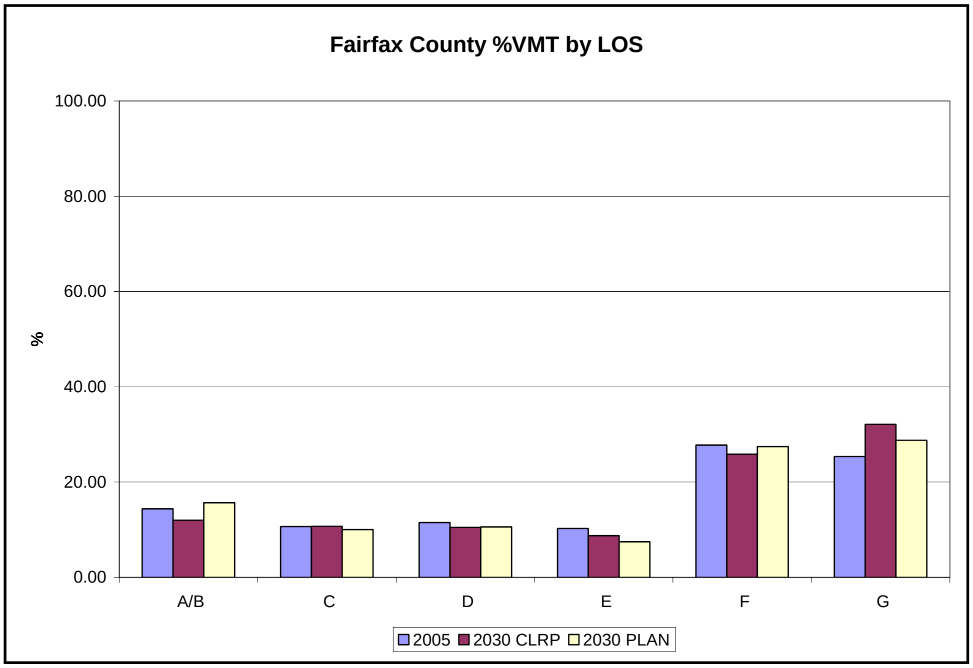


Figure 33 Loudoun County % VMT by LOS

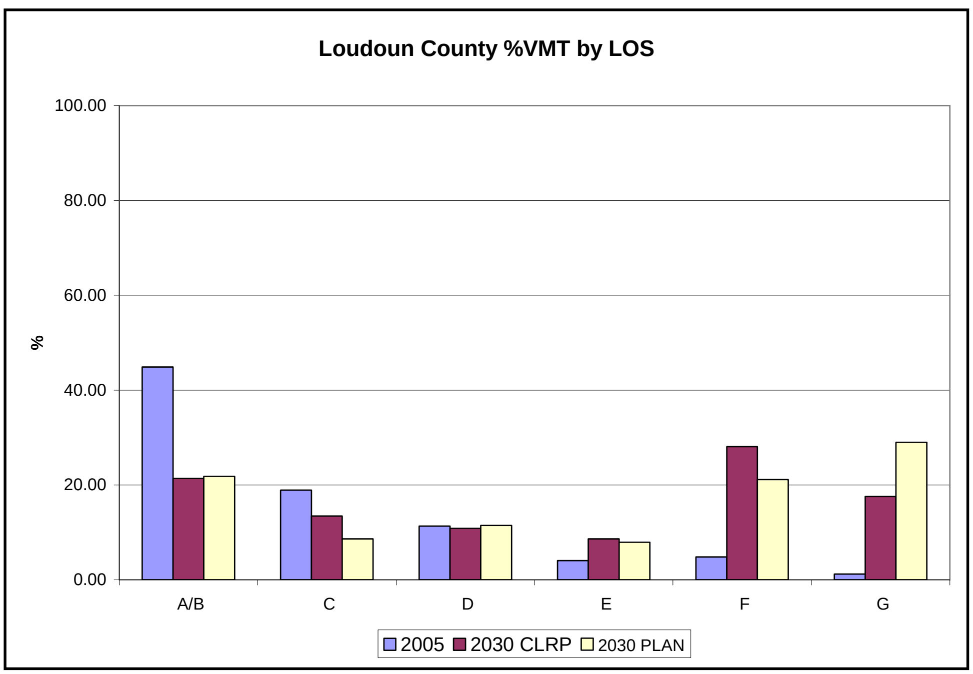


Figure 34 Prince William County % VMT by LOS

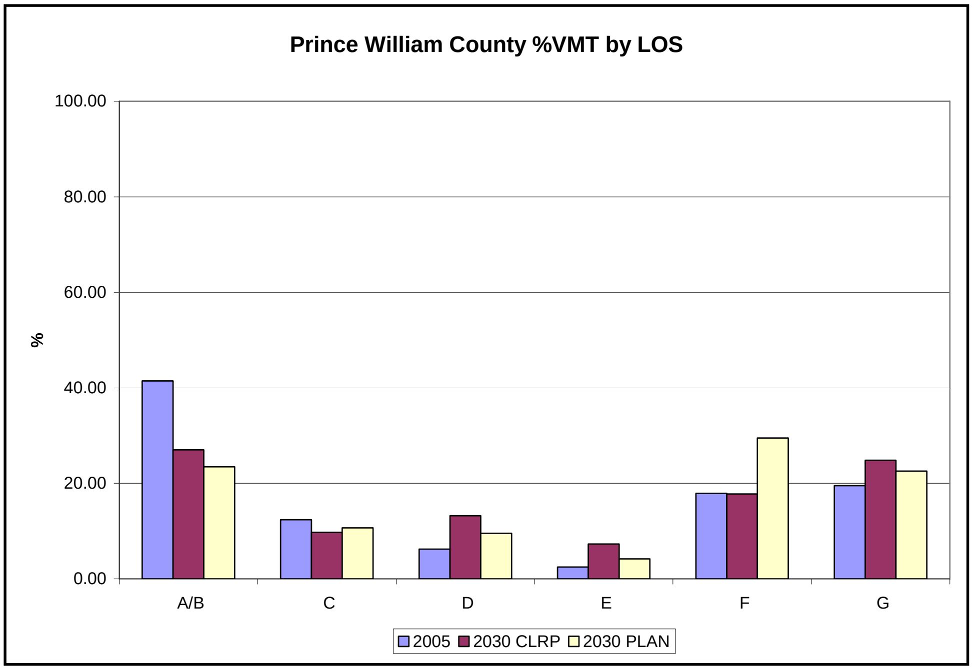


Figure 35 Arlington County % VMT by LOS

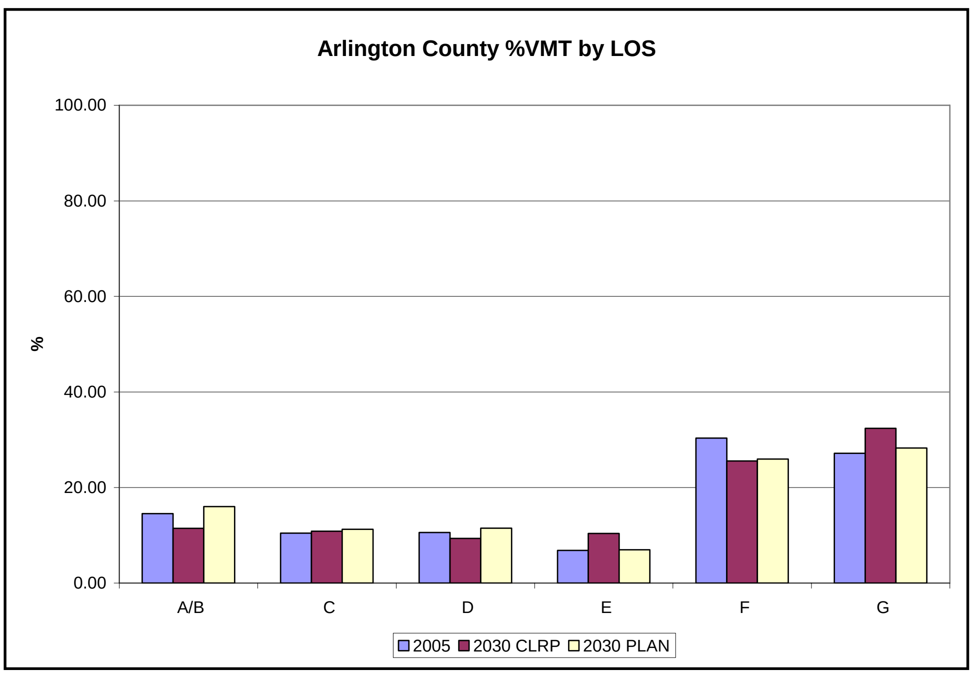
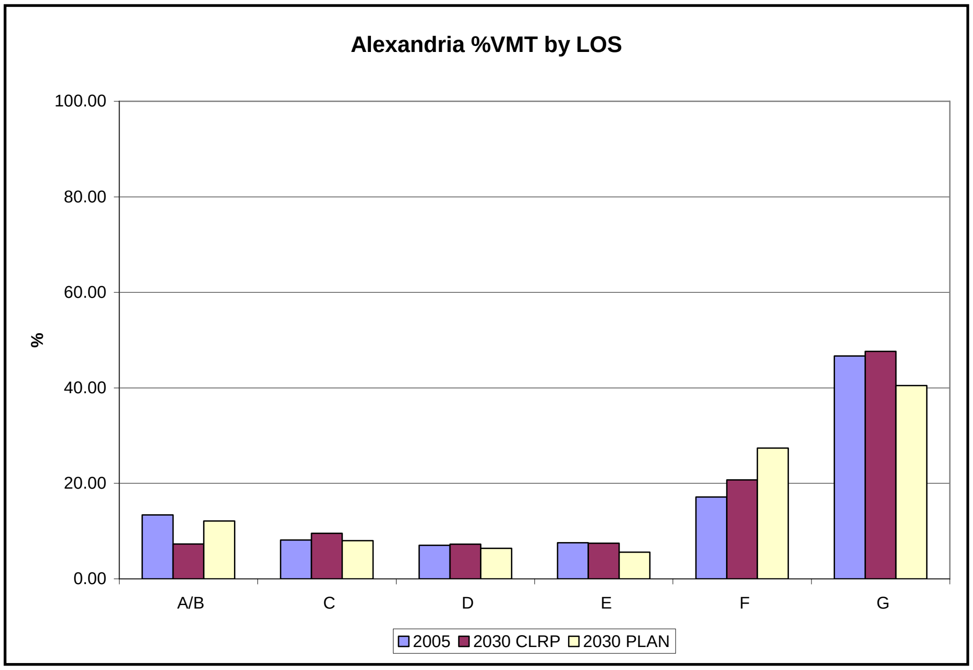


Figure 36 Alexandria % VMT by LOS



3.3.3 Personal Accessibility

The personal accessibility estimates via auto and transit in each Northern Virginia jurisdiction are shown for the 2005, 2030 CLRP and TransAction 2030 Plan scenarios in Figures 37 and 38. Personal accessibility was calculated as the average number of jobs within 45 minutes of households in each jurisdiction. Among these three scenarios, the TransAction 2030 Plan condition always shows the highest personal accessibility by auto and transit in all jurisdictions.

The results show a 20% improvement in personal accessibility via auto from 2005 to 2030 CLRP in the outer jurisdictions of Loudoun and Prince William Counties, while the three remaining jurisdictions have approximately a 5% increase. Improvements in accessibility between 2005 and 2030 can be due to a combination of job growth and transportation system improvements. However, improved accessibility between 2030 scenarios is due solely to transportation system improvements since the number of jobs is constant for all 2030 scenarios. The TransAction 2030 Plan will further improve personal accessibility by approximately 5% to 33% above the 2030 CLRP. The improvement is greatest with personal accessibility via transit, given the fact that a significant amount of transit projects will be constructed in the 2030 CLRP and TransAction 2030 Plan scenarios. Arlington and Alexandria will almost double from 2005 to the TransAction 2030 Plan; Fairfax, Loudoun, and Prince William Counties will have 173, 1,062, and 939 percent increases, respectively.

The personal accessibility estimates of disadvantaged households via auto and transit in each jurisdiction are shown in Figures 39 and 40. For the purposes of this analysis, disadvantaged households were defined as households in the lowest income quartile according to MWCOG land use forecasts. The results show a similar pattern to the previous charts.

Figure 37 Average Number of Jobs within 45 Minutes of Households Via Auto

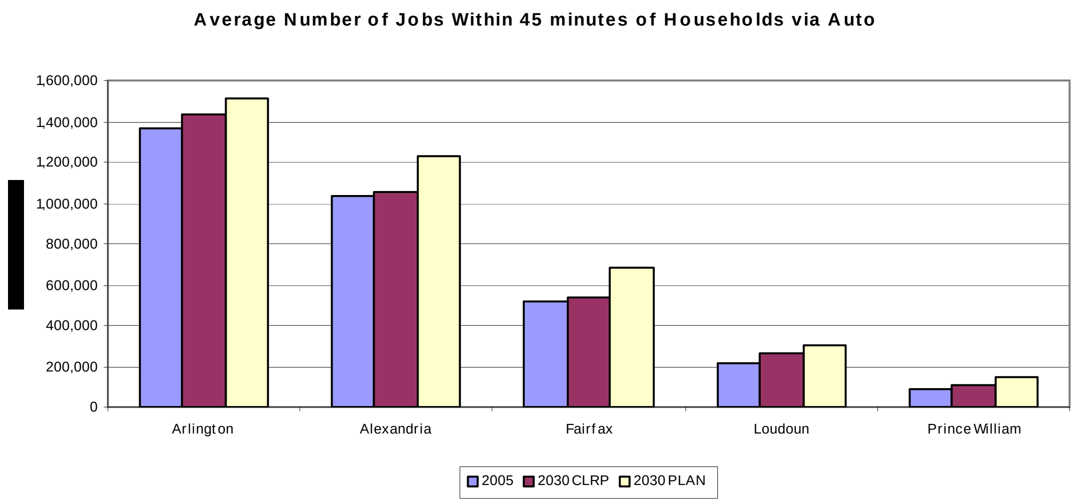


Figure 38 Average Number of Jobs within 45 Minutes of Households Via Transit

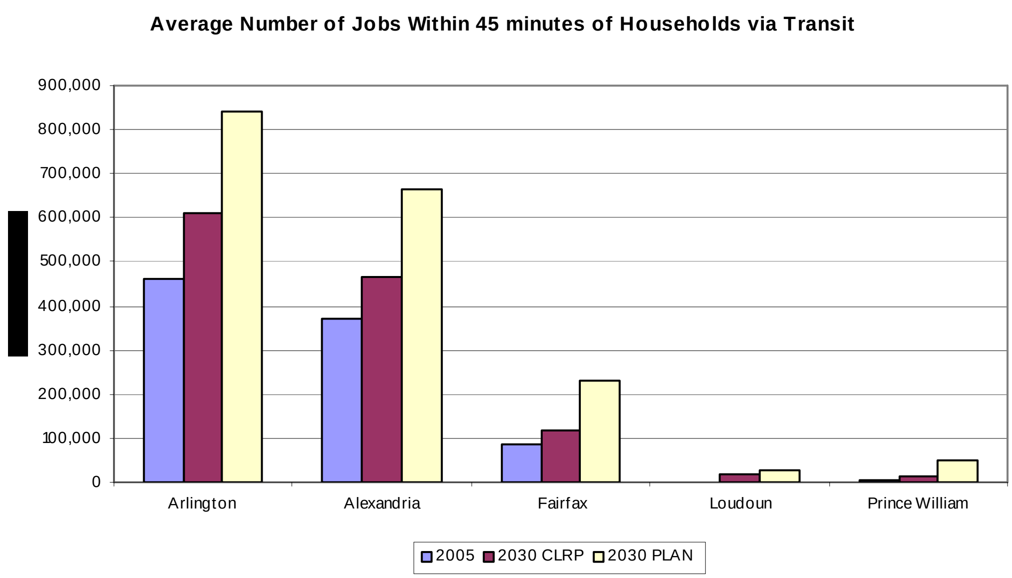


Figure 39 Average Number of Jobs within 45 Minutes of Disadvantaged Households via Auto

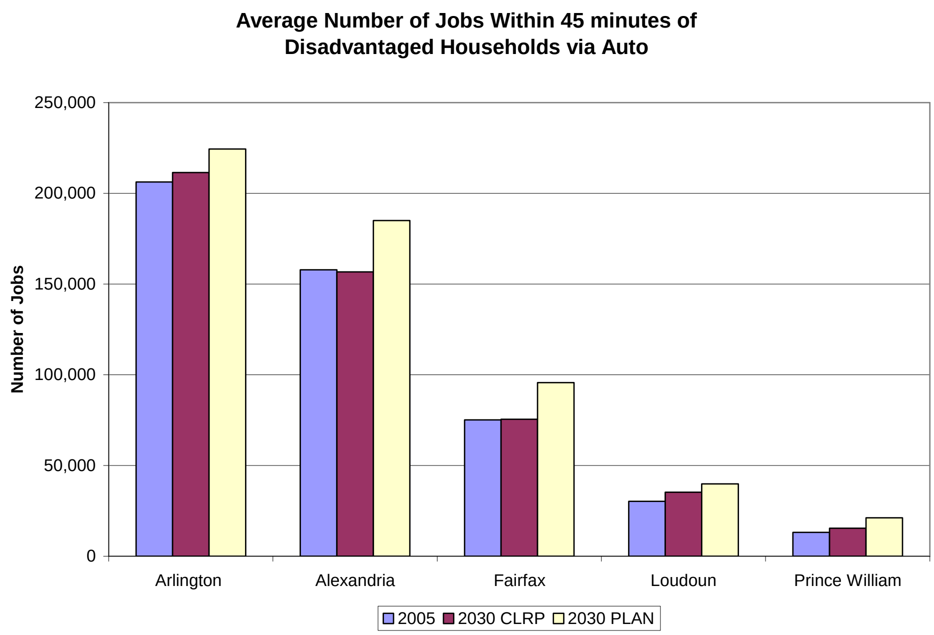
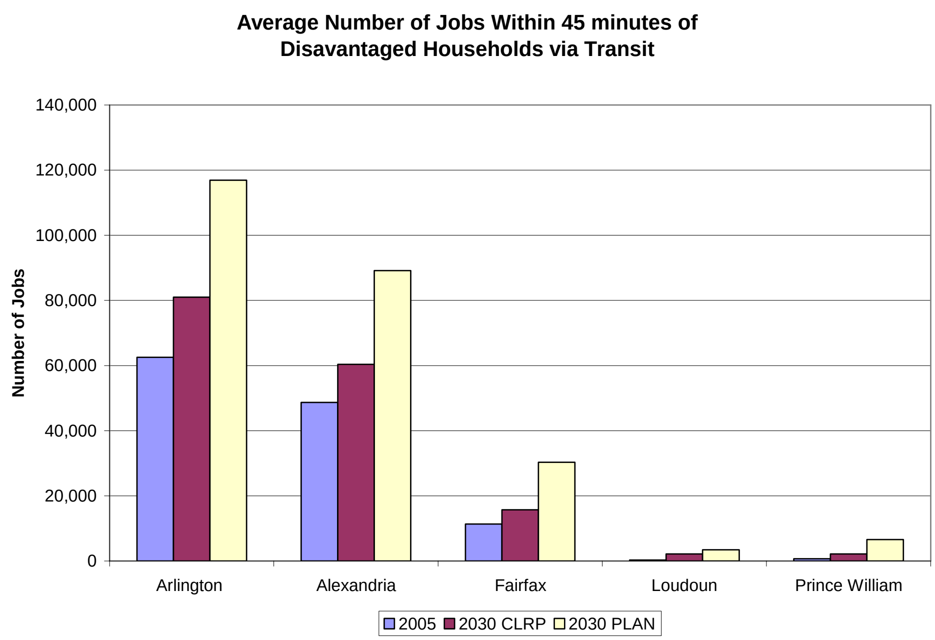


Figure 40 Average Number of Jobs within 45 Minutes of Disadvantaged Household via Transit



3.3.4 Transportation-Land Use Linkage

Activity Center Level of Service

A complete set of maps for all activity centers for both 2030 scenarios is provided in the Technical Appendix, along with tables giving the LOS results for all activity center pairs. The remainder of this section summarizes the results of the two scenarios.

2030 CLRP

Compared to 2005, the difference in door-to-door transit and auto travel times between the 210 combinations of activity center pairs improved by at least one LOS grade for 76 of the combinations, stayed the same for 130 combinations, and got worse by at least one LOS grade for only 4 combinations. Travel times particularly improved for trips to and from Manasses, Leesburg, and Tysons Corner, and for trips to Crystal City, Ballston, and Dulles Town Center.

Service frequency between activity center pairs improved by at least one LOS grade for 45 combinations, stayed the same for 164 combinations, and got worse by one LOS grade for only 1 combination. Service to and from Manassas, Leesburg, and Tysons Corner, and to Crystal City, Ballston, and Dulles Town Center showed the greatest improvements in frequency.

Hours of service between activity center pairs improved by at least one LOS grade for 16 activity center pairs and stayed the same for the other 194 pairs. Service to and from Reston West showed the greatest improvement.

TransAction 2030 Plan

Compared to 2005, the difference in door-to-door transit and auto travels times improved by at least one LOS grade for 105 combinations, stayed the same for 102 combinations, and got worse by at least one LOS grade for only 3 combinations. Travel times particularly improved for trips to and from Manasses, Leesburg, Crystal City, and Tysons Corner, and for trips to Reston West, Fairfax, Woodbridge, and Dulles Town Center.

Service frequency improved by at least one LOS grade for 82 activity center pairs and stayed the same for the other 128 pairs. Service to and from Dulles Town Center, Manassas, and Woodbridge, and from leesburg and Reston West showed the greatest improvements in frequency.

Hours of service improved by at least one LOS grade for 52 activity center pairs and stayed the same for the other 158 pairs. Trips to and from Woodbridge, Manassas, and Reston West were responsible for most of the improvement.

In summary, the activity centers showing the greatest improvements in transit level of service were the ones served by rail transit. Activity centers newly connected by Metrorail extensions consistently showed improvements in relative transit-auto travel times, and also showed improvements in frequency and hours of service. Improved VRE frequencies and the development of two light rail lines also helped improve activity center LOS values. Finally, improved bus service to Leesburg improved its LOS values, although they remained low compared to the rest of the region.

Transit Service Coverage Level of Service

Figures 41, 42 and 43 show the transit service coverage LOS results for 2005, 2030 CLRP and TransAction 2030 Plan conditions.

2030 CLRP

The 2030 CLRP scenario provides a slight net increase in bus route miles, compared to 2005 (1,518 miles in 2030 versus 1,511 miles in 2005). Routes are added in the Ashburn area between Leesburg and Dulles Town Center, but the scenario also includes service cuts south of Leesburg, west of Manassas, and around Herndon and Tysons Corner. This scenario also provides a new Metrorail extension in the Dulles Corridor. The VRE commuter rail system would be the same as 2005, but with more frequent service.

Figure 42 shows regional service coverage under the 2030 CLRP scenario. As before, areas served by transit are shown in green and yellow, transit-supportive areas are shown in green and red, and service coverage LOS is calculated by dividing the green area by the combined green and red area. Under this scenario, 51% of the region's transit-supportive areas would be served by transit (LOS E), compared to 68% (LOS D) in 2005. The main reason for the drop in LOS is the substantial increase in transit-supportive areas—particularly in eastern Loudoun County, southeastern Fairfax County, and around Haymarket, Dale City, and Dumfries in Prince William County—resulting from new development during the 25-year period. Although some bus service increases would occur in eastern Loudoun County under this scenario, in general, developed area would increase at a much faster rate than the area served directly by transit. Inside the Beltway, service coverage remains at the high levels seen in 2005.

Although only 51% of the transit-supportive area would be served, 71% of the region's jobs and 63% of the households within transit-supportive areas would be served. The reason for this difference is that the newly developed areas would often be near the minimum density required to support hourly transit service. The more densely developed portions of the region that can support more frequent bus service, such as Arlington County and Tysons Corner, would generally be well-served.

Figure 41   2005 Transit Service LOS

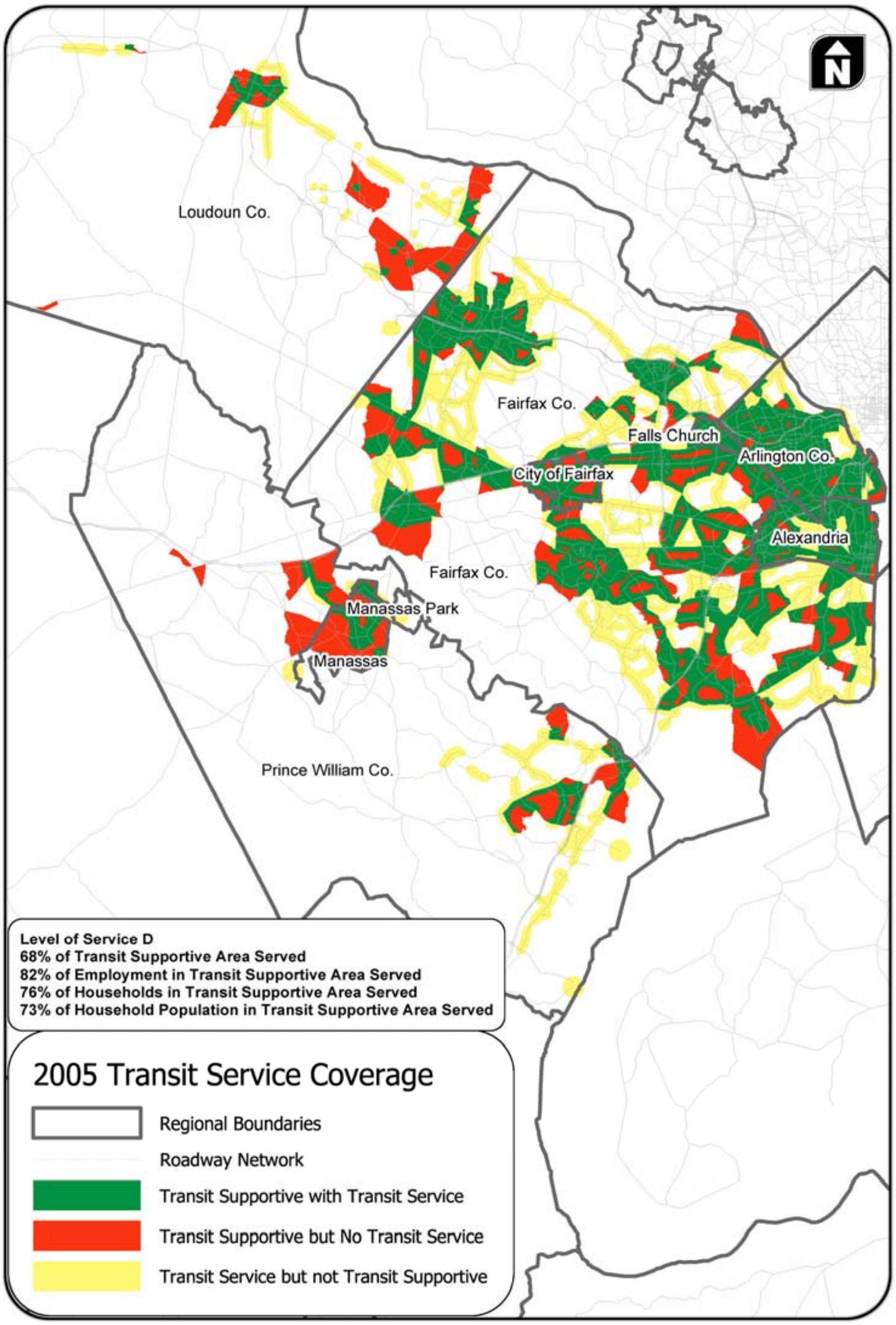


Figure 42 2030 CLRP Transit Service Coverage LOS

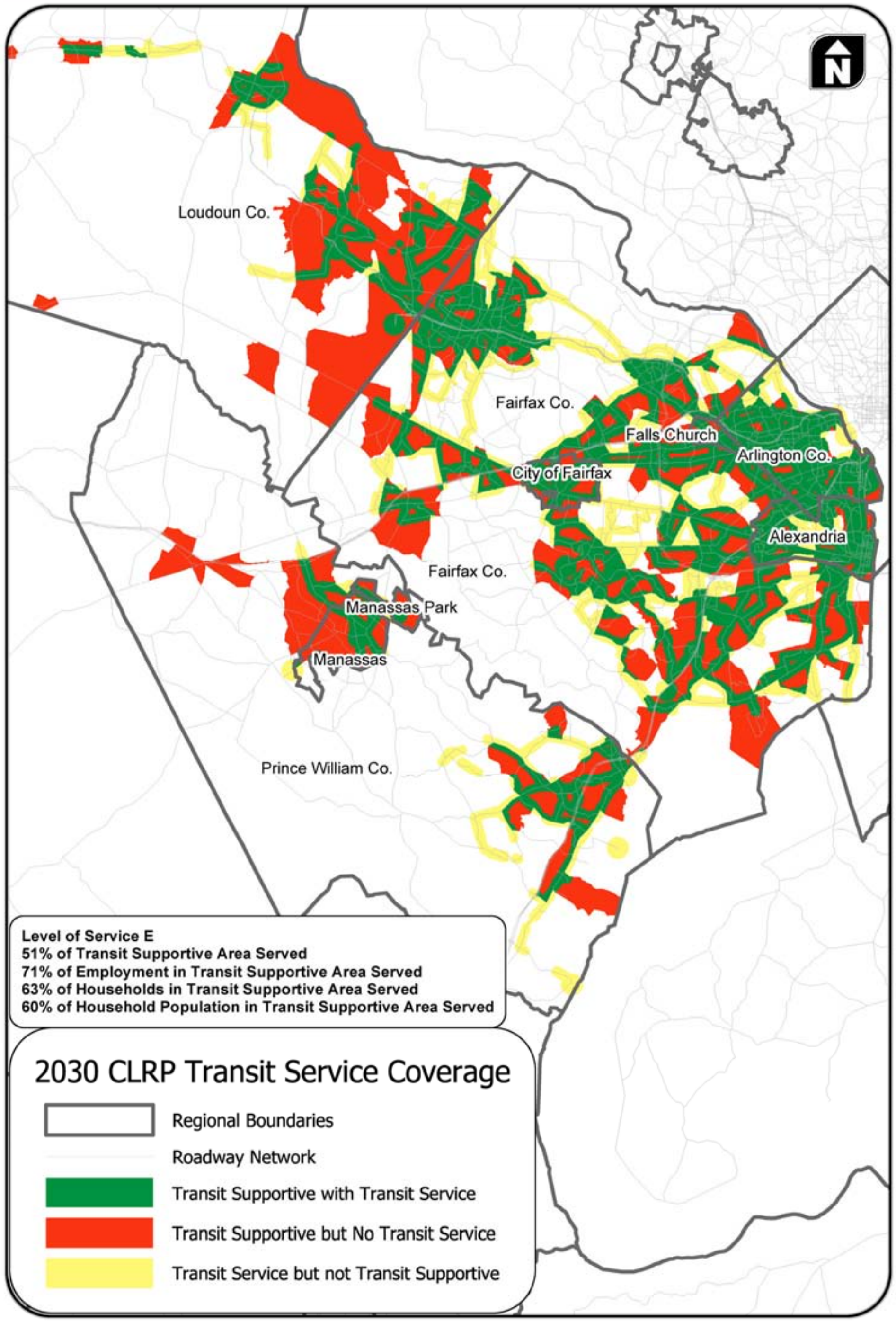
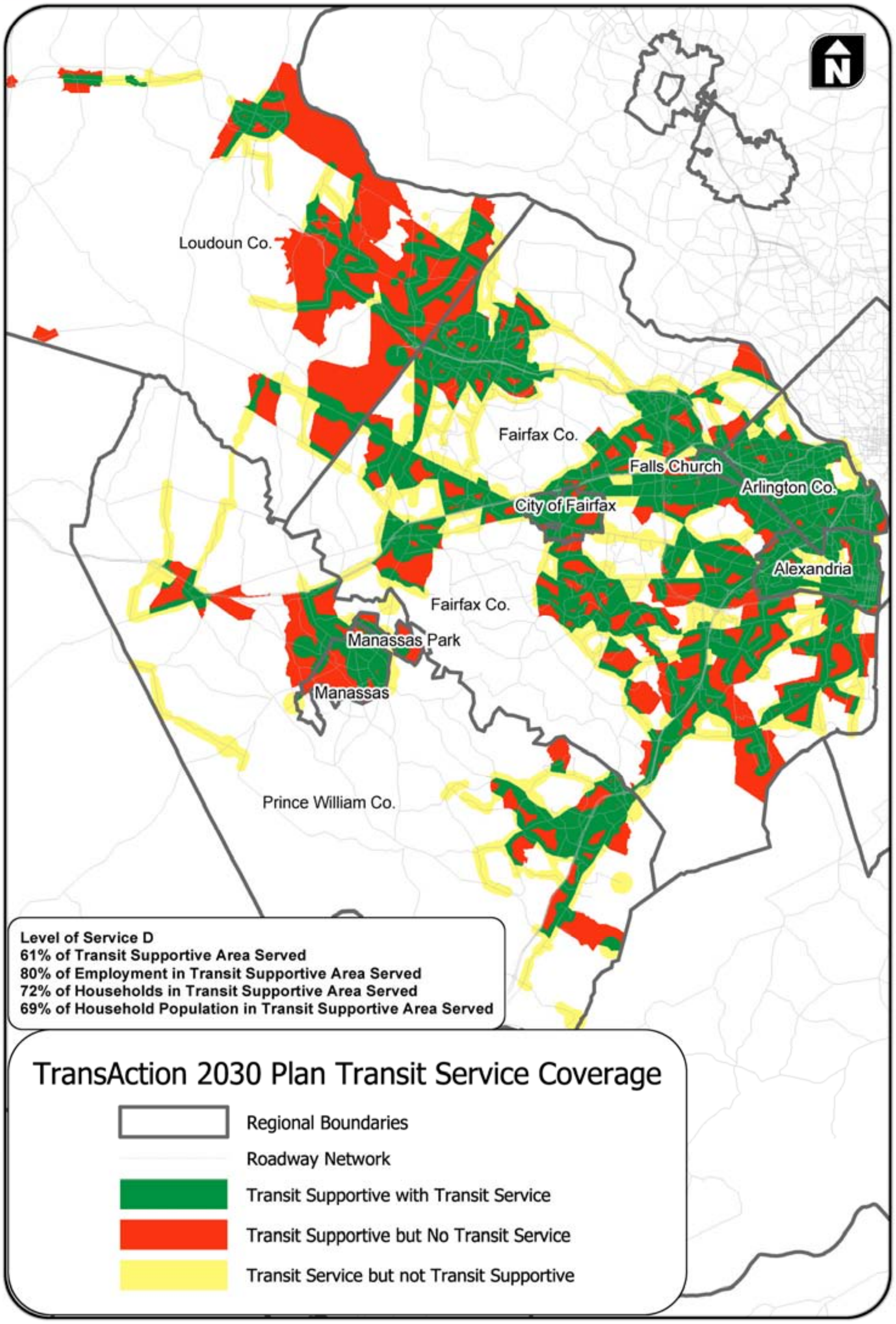


Figure 43   TransAction 2030 Plan Transit Service Coverage LOS



TransAction 2030 Plan

The TransAction 2030 Plan scenario further increases bus service, resulting in 1,586 route miles in 2030, compared to 1,511 miles in 2005. Locations with added bus service include Chantilly, Lorton, Ashburn, south of Leesburg, Annandale, North Springfield, Herndon, and western Prince William County.

Metrorail expansions consist of a Blue Line extension to Woodbridge, an Orange Line extension to US 29, plus a new line paralleling the Beltway from the Dunn Loring/Merrifield station north into Maryland, passing through Tysons Corner. An infill station would be added to the existing Blue and Yellow Lines at Potomac Yard.
The VRE Manassas Line would be extended to Nokesville, and a new line would be developed between Manassas and Haymarket. An infill station would be added to the Fredericksburg Line at Cherry Hill.

Figure 43 shows regional service coverage for the TransAction 2030 Plan scenario. Under the TransAction 2030 Plan scenario, 61% of the region's transit-supportive areas would be served by transit (LOS D), compared to 68% (LOS D) in 2005 and 51% (LOS E) in the CLRP scenario.

The significant improvement in LOS over the CLRP scenario is a result of the additional service described above in the Prince William and Fairfax County areas where density in 2030 is expected to reach transit supportive levels. Specifically, the light rail service connecting Herndon and Manassas, the VRE Extension to Haymarket, and new Express Bus service in the US 50 corridor added coverage in areas not served in other scenarios. The closely spaced light rail and Express Bus stations are both buffered at ½ mile distance in the same manner as the Metrorail and VRE stations.

The 61% of the transit-supportive area served is significantly greater than the CLRP scenario but still short of the 2005 conditions. Similarly, 80 % of the region's jobs and 72% of the households within transit-supportive areas would be served but these fall short of the existing proportions. As with the CLRP scenario the newly developed areas at the periphery of the region have both minimal service but also are near the minimum densities necessary to support transit service. The more densely developed areas within and adjacent to the Beltway are more effectively served by bus and rail.

Trips by Mode and Purpose Between Activity Centers

The comparison of total activity center person trips by purpose and mode under the 2005, 2030 CLRP and TransAction 2030 Plan networks, which are based on MWCOG's mode choice model outputs, are shown in Figures 44 and 45. Centers are comprised of more than one zone and vary in size. Therefore, the trip summaries shown in Figures 44 and 45 should be interpreted in terms of relative differences between scenarios, as opposed to the absolute volume. In terms of projected number of total person trips between activity centers, similar results are obtained for the two 2030 scenarios, which represent a 50% increase from 2005.

In Figure 44, total person trips are disaggregated into different trip purposes. In general, there is no significant difference between the two future scenarios in terms of projected person trips by trip purpose. Home-based other (HBO) travel has the greatest increase, which is a 58% increase under both the 2030 CLRP and TransAction 2030 Plan scenarios. Non-home based (NHB) travel also gains 56% under the 2030 CLRP and 51% under the TransAction 2030 Plan. Comparatively, the increases in home-based work (HBW) travel and home-based shopping (HBS) travel are not as great as the previous two purposes. Those increases in non-work related trips are a product of improved multimodal accessibility to the activity centers.

In Figure 45, the total trips are grouped by three modes: Low Occupant Vehicle (LOV), HOV, and transit (Bus and Rail). In all three scenarios, LOV trips account for approximately 98 percent of the total trips. Under the 2030 CLRP network, projected transit trips are 1049, almost double 2005, while under the TransAction 2030 Plan network, there is a dramatic 296% increase in transit trips over 2005.

Figure 44 Total Activity Center Trips by Purpose

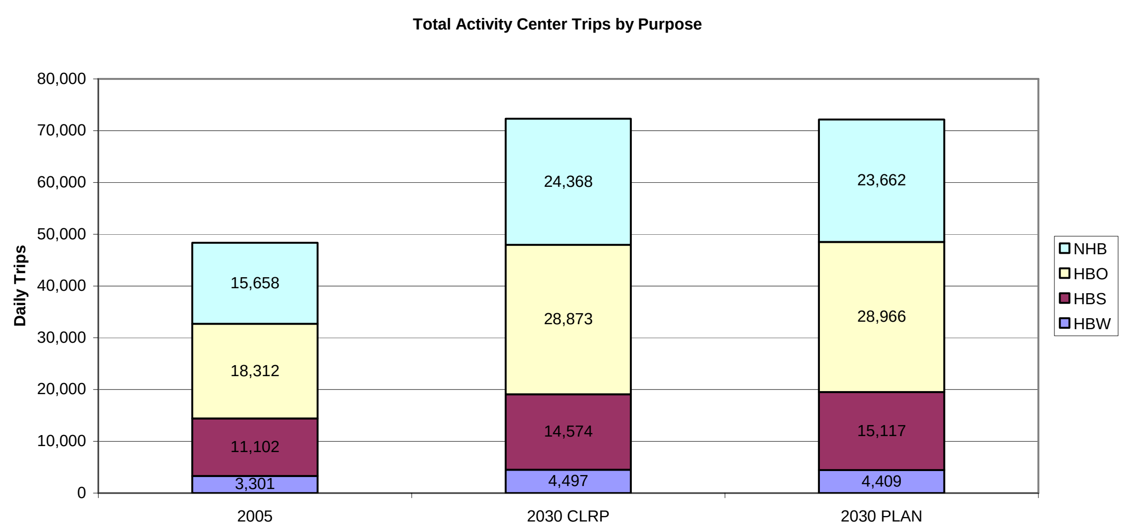
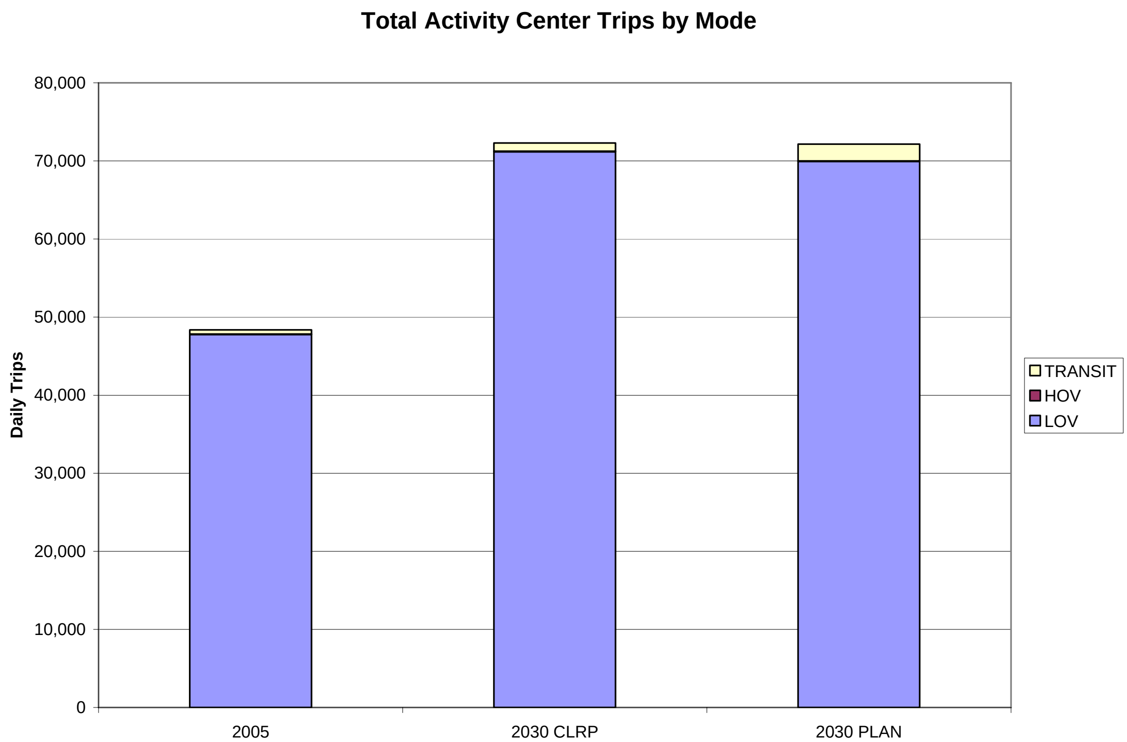


Figure 45 Total Activity Center Trips by Mode



VMT Per Capita by Jurisdiction

VMT per capita is determined by dividing the total jurisdictional VMT by population in each Northern Virginia jurisdiction. Figure 46 shows a comparison of VMT per capita in each jurisdiction for the 2005, 2030 CLRP and TransAction 2030 Plan scenarios. Arlington County and Alexandria show a decrease for future year scenarios from current data by approximately 10 percent and 5 percent, respectively. The remaining three counties show an increase from 2005 to the TransAction 2030 Plan. VMT per capita in Prince William and Loudoun Counties increases under the TransAction 2030 Plan scenario due to increased auto travel on new or expanded highway facilities. Figure 47 summarizes VMT per capita for Northern Virginia.

Figure 46 24 Hour VMT per Capita by Jurisdiction

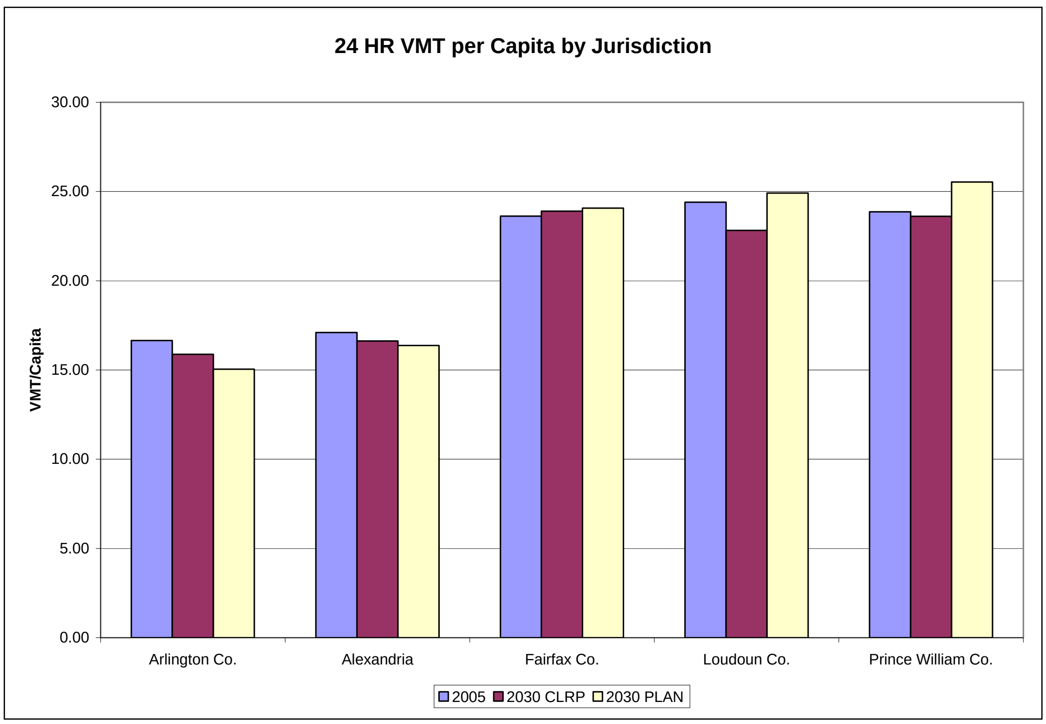
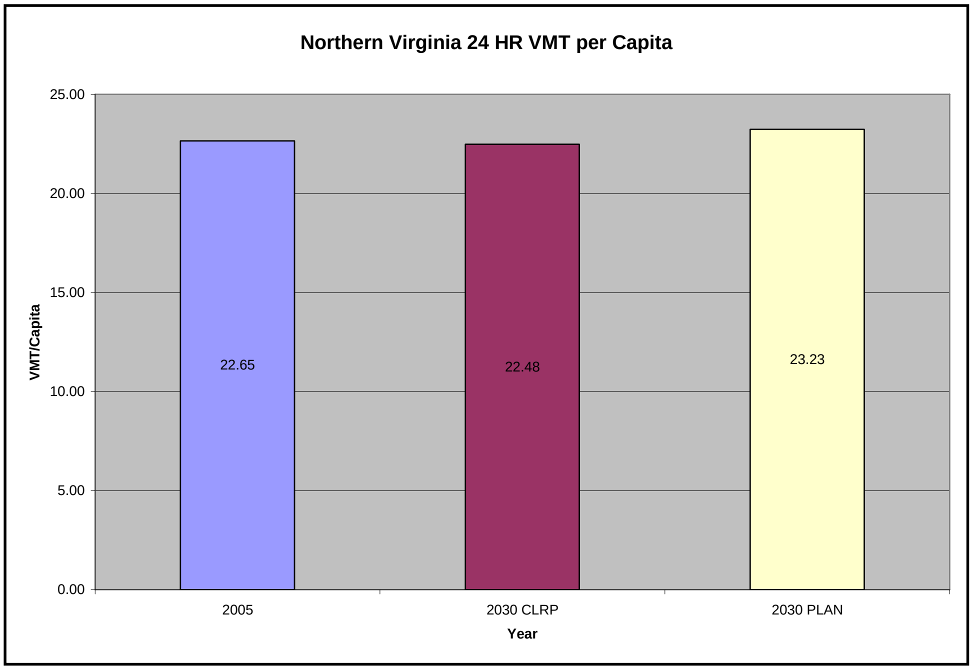


Figure 47 Northern Virginia 24 Hour VMT per Capita



Percent Transit and HOV Trips by Activity Center

Table 6 shows the percent of transit and HOV trips for each activity center for the three scenarios. Note that percentages have been rounded to the nearest whole percent. Among these activity centers, only downtown Washington and Rosslyn indicate a high percentage of transit trips, greater than 20 percent, due to easy access to the transit system. The majority of activity centers show an increase in the transit and HOV mode share from 2005 to 2030 conditions, in which the TransAction 2030 Plan has a higher percentage. For example, Merrifield – Dunn Loring has 1%, 2%, and 9% share of HOV and transit trips in the year 2005, 2030 CLRP, and TransAction 2030 Plan, respectively.

Table 6 Percent of Transit and HOV Trips by Activity Center

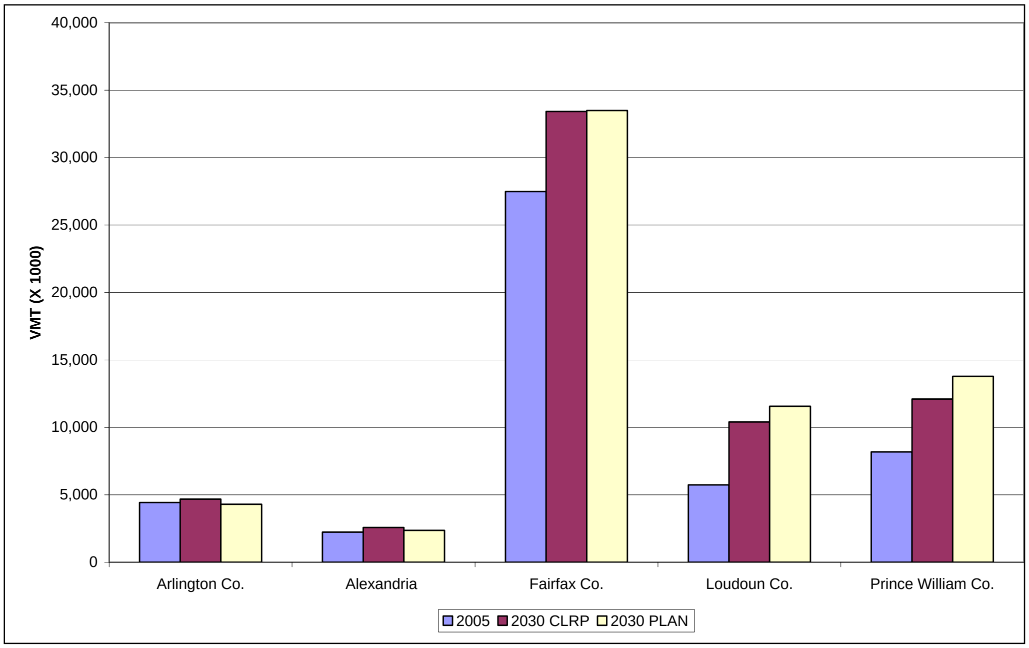
Activity Centers	2005	2030 CLRP	2030 Plan
Downtown Washington	26%	24%	34%
Ballston	8%	11%	23%
Rosslyn	13%	15%	23%
Downtown Alexandria	6%	8%	15%
Landmark Mall	2%	4%	9%
Tysons Corner	1%	1%	4%
Reston West	1%	1%	4%
City of Fairfax – GMU	1%	2%	4%
Merrifield – Dunn Loring	1%	2%	9%
Springfield	5%	4%	6%
Woodbridge	1%	1%	1%
Downtown Manassas	1%	1%	1%
Downtown Leesburg	1%	1%	1%
Dulles Town Center	1%	1%	1%

3.3.5 Environment

VMT by Roadway Facility Type by Jurisdiction

The 2005, 2030 CLRP and TransAction 2030 Plan roadway network 24-hour VMT is shown for each Northern Virginia jurisdiction in Figure 48. The VMT remains approximately the same in Arlington and Alexandria for the three scenarios despite population growth in both of these jurisdiction. The remaining three Counties all show different levels of increase from 2005 to 2030 scenarios. In Loudoun County, for example, the total VMT will increase 82 percent from 2005 to 2030 CLRP and almost double as compared to 2005 under the TransAction 2030 Plan scenario.

Figure 48 24 Hour VMT by Northern Virginia Jurisdiction



The roadways in the study area were grouped into five roadway facilities types: freeway, major arterial, minor arterial, collector, and expressway. Freeways and expressways are considered high speed facilities with limited and controlled access points. Comparatively, with signals and interruptions from side streets, arterials and collectors have more stop-and-go operating conditions, which generally results in and increased emissions as compared to freeways and expressways. An exception to this is ozone emissions, which are higher at low and high speeds, and lower at medium speed. A detailed summary of VMT by roadway facility type for each jurisdiction is shown in Figures 49 through 53.

A comparison of VMT for the 2030 CLRP and TransAction 2030 Plan networks was performed, as shown in Figure 54. Fairfax, Loudoun, and Prince William Counties show an increase of VMT on freeways and expressways by 7% to 42% with a decrease on arterials and collectors by approximately 10%. Arlington County and Alexandria show decreases in VMT for both highways and arterials from 2030 CLRP to TransAction 2030 Plan. These results indicate that emissions in Arlington and Alexandria will decrease under the TransAction 2030 network since VMT decreases on both arterials and freeways. The results for the remaining jurisdictions are less definitive at this level of analysis. Although VMT on arterials and collectors decreases under the TransAction 2030 network, VMT increases dramatically on freeways, especially in Loudoun and Prince William Counties. Air quality modeling would be required to quantify the emissions effects of the TransAction 2030 network in these areas.

Figure 49 VMT by Facility Type in Arlington County

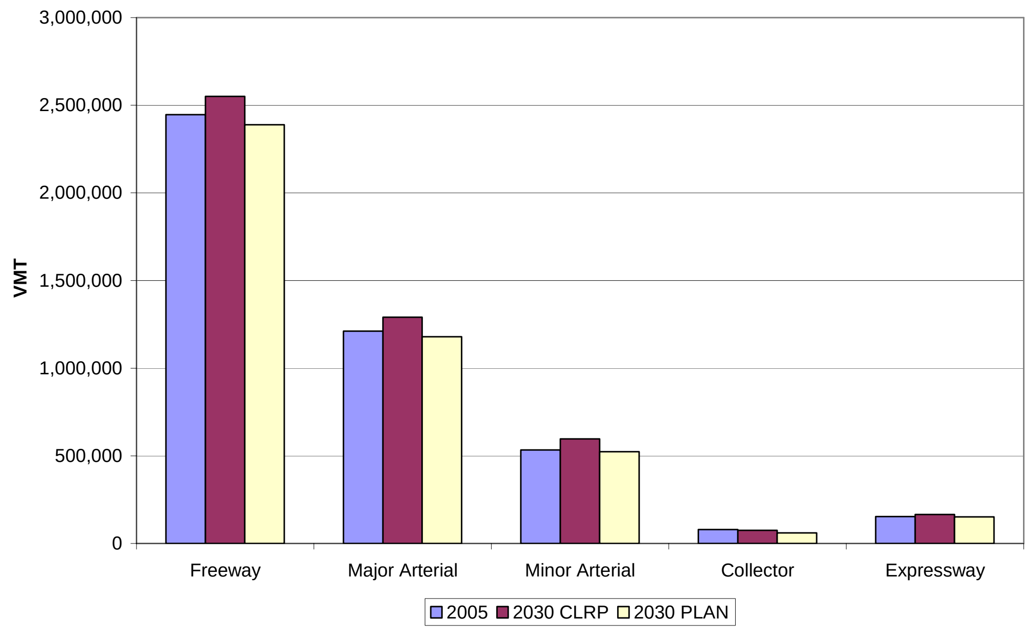


Figure 50 VMT by Facility Type in Alexandria

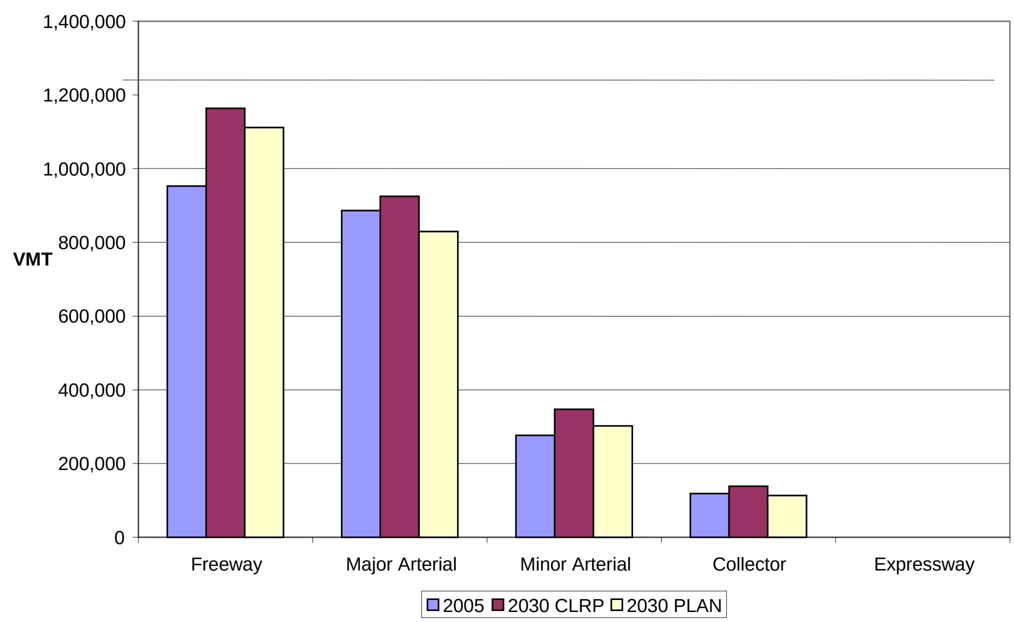


Figure 51 VMT by Facility Type in Fairfax County

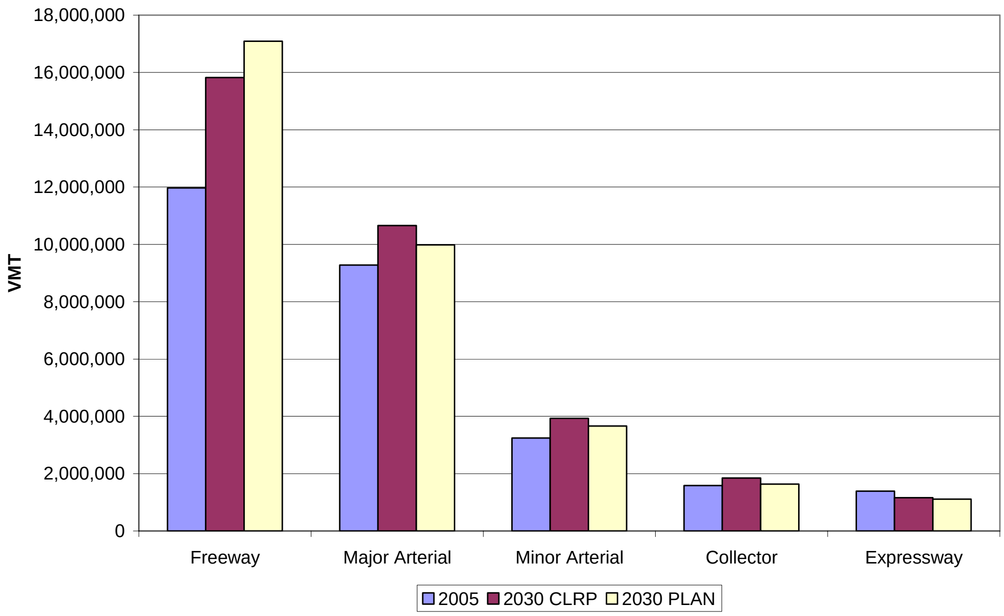


Figure 52 VMT by Facility Type in Prince William County

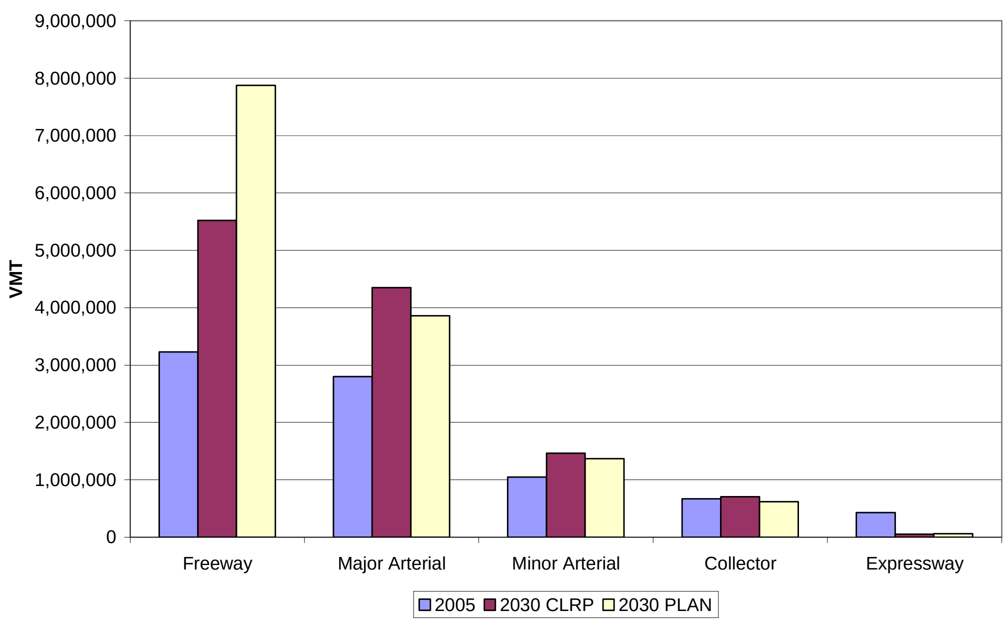


Figure 53 VMT by Facility Type in Loudoun County

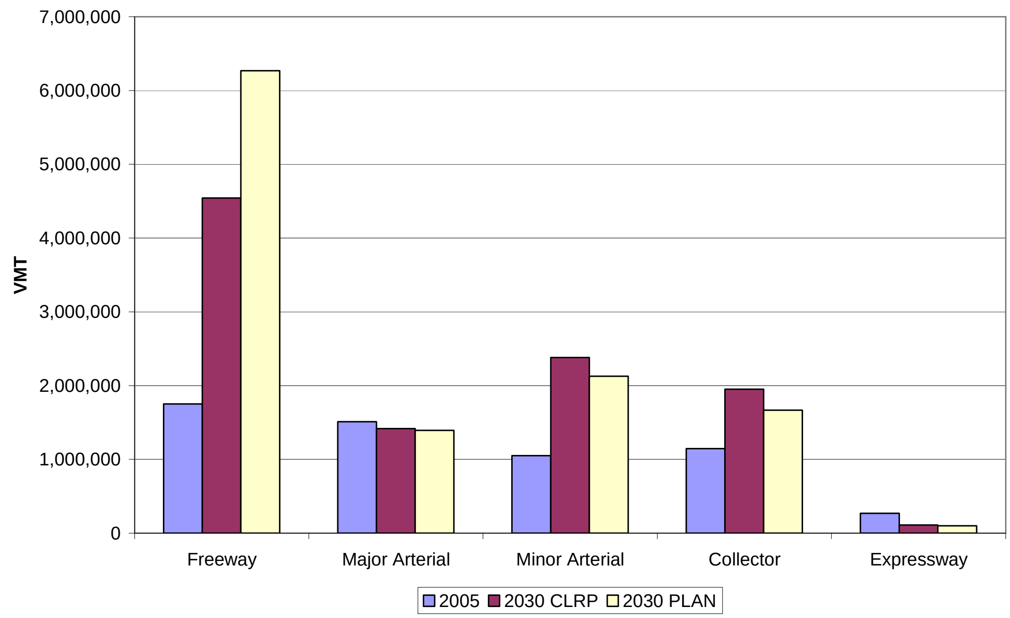
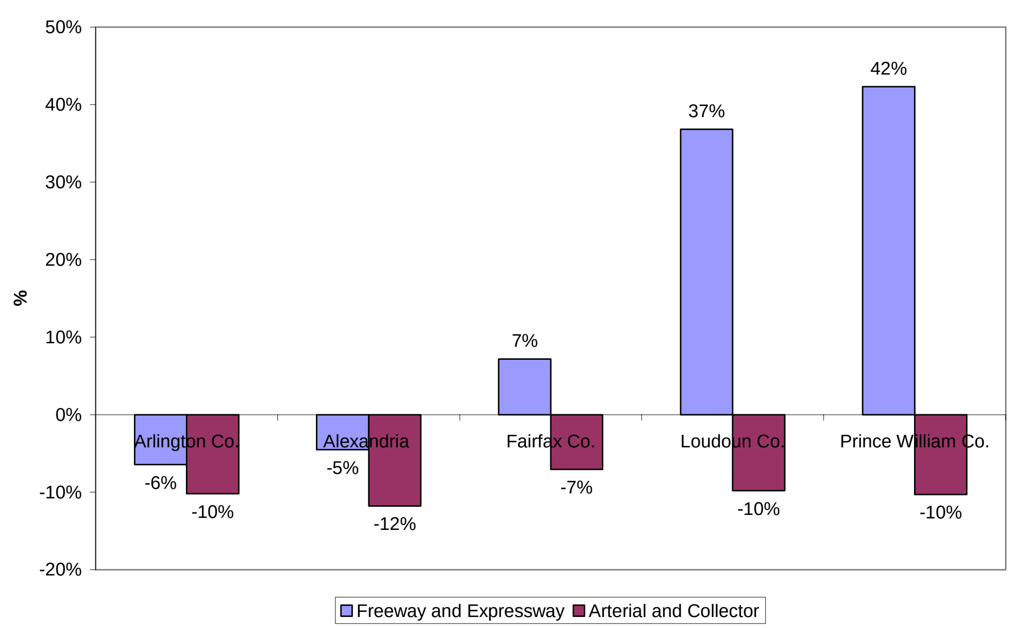


Figure 54 VMT Change from 2030 CLRP to TransAction 2030 Plan



4

Prioritization of TransAction 2030 Plan Projects

4.1 Prioritization Methodology

One of the major goals of the TransAction 2030 Plan was to present a list of projects that will receive priority funding. This is especially important given the estimated funding shortfall of over $15 billion. To arrive at a set of priorities, NVTA, their technical committee and a committee studying Alternative Transportation and Land Use Strategies (ATLUS) provided input from which a series of project-based evaluation criteria were developed. These criteria helped determine whether specific projects are compatible with the goals of the 2020 Plan, adopted by the Transportation Coordinating Council in December 1999.

Each TransAction 2030 Plan project was rated against each of the criteria using a three-level rating system. A full moon represented a high rating, a half moon represented a medium rating and an empty moon represented a low rating. A total of nineteen criteria were identified and keyed to the 1999 TCC Resolutions. These criteria are described below as they relate to each TCC Resolution.

TCC Resolution

"The Northern Virginia 2020 Plan provides a balance of future investment in highway and transit projects and enhances mobility throughout the region, and retaining this balance should be a goal as the 2020 Plan is implemented."

Activity Center Connections

Projects that improve connections between multiple activity centers.

●	Improves connectivity between three or more activity centers
◒	Improves connectivity between two activity centers
○	Improves connectivity to one activity center only

Multimodal Choices

Projects that create multimodal choices for travelers. Modes include travel by car, train, bus, bicycle or on foot.

●	Adds new mode or extension of existing mode to corridor
◒	Major service improvement to existing mode in corridor
○	Minor service improvement to existing mode in corridor

Major service improvements could include:

- Roadway widening
- Multiple grade separations along one roadway
- Widening of High Occupancy Vehicle (HOV lanes)
- Transit service improvements such as increased frequency and other capacity improvements to an existing line
- Addition of park-and-ride lots
- Enhancements to existing Intelligent Transportation Systems (ITS)
- Construction of bicycle or pedestrian trails

Minor service improvements could include:

- Expansion of park-and-ride lot
- Intersection/interchange reconstruction
- Grade separation of existing intersections
- Access and parking improvements

Person Throughput

Projects that provide for increased person-capacity within a corridor, with the goal of moving the most people, rather than vehicles.

●	Project significantly increases corridor person throughput
◒	Project has minor effect on corridor person throughput
○	No effect on corridor person throughput

Intermodal Connections (i.e., between existing modes)

Projects that provide enhanced connections among modes (auto, bus, rail, bicycle, walking).

●	Adds new intermodal connection
◒	Improves existing intermodal connection
○	No effect on intermodal connection

Management and Operations – Technology

Projects that improve the management and operation of existing facilities through technology applications.

●	Project improves technological management and operations of an existing transportation facility
◒	Project improves technological management and operations of an expansion of an existing transportation facility
○	No improvement to management and operations of a facility

TCC Resolution

"The transportation improvements called for by the Plan's Year 2010 timeframe shall be designated as TCC Regional Priority projects. The annual legislative programs, Six-Year Plan Pre-Allocation Hearing testimony, and federal advocacy efforts of the TCC shall further prioritize these projects to facilitate their timely construction."

Urgency

Projects that address existing significant Level of Service (LOS) deficiencies for all modes of transportation.

●	Project addresses existing LOS F or G condition
◒	Project addresses existing LOS E condition
○	Project addresses existing LOS A, B, C or D condition

Need for Rehabilitation

Projects that address major maintenance for aging infrastructure, whether roads, bridges, or transit facilities.

●	Facility is seriously dilapidated (e.g. weight restrictions put into effect)
◒	Facility is in need of more than routine maintenance
○	Facility does not need rehabilitation (maintenance inferred)

TCC Resolution

"… individual projects will be evaluated based on whether they promote protection of sensitive environmental, cultural, historical and neighborhood locations."

Right-of-Way (ROW)

Project ROW impacts on sensitive areas.

●	No additional ROW needed
◒	Minimal ROW required and project does not impact sensitive area
○	Additional ROW required and project does impact sensitive area

TCC Resolution

"… individual projects will be evaluated based on whether they reduce, rather than increase, vehicle miles traveled (VMT) and VMT per capita."

Mode Share

Projects' effects on mode share.

●	Project will generally encourage an increase in non- SOV travel through the addition or expansion of an HOV or transit facility
◒	Project will generally encourage an increase in non-SOV travel through addition or expansion of bicycle or pedestrian trails, park-and-ride lots and/or operational improvements to existing transit services
○	Project will result in no discernable reduction in non-SOV travel

Reduce VMT

Projects' effects on vehicle miles traveled (VMT).

●	Project directly reduces VMT (i.e., transit project, park-and-ride lot, new HOV lane(s), new pedestrian and bicycle trail)
◒	Project indirectly or through expansion reduces VMT (i.e., expansion of HOV, transit improvement or expansion)
○	Project does not reduce VMT

TCC Resolution

"… individual projects will be evaluated based on whether they provide for multiple use development patterns that reduce automobile dependency, with a mix of jobs, housing, and services in a walkable environment."

TCC Resolution

"… individual projects will be evaluated based on whether they encourage development to be located where it can be served by existing infrastructure."

TCC Resolution

"… individual projects will be evaluated based on whether they provide incentives for concentrations of residential and commercial development along transportation/transit corridors within and near the regional core and regional activity centers, such as zoning, financial incentives, transfer of development rights, priority infrastructure financing, and other measures."

TCC Resolution

"… individual projects will be evaluated based on whether they take advantage of supportive zoning regulations and other tools that will help promote concentration of development within walking distances of transit facilities, and generally promote a pedestrian orientation in new development."

Compatibility with Local Comprehensive Plans

Projects are included in transportation element of jurisdiction comprehensive plans.

	Project is in adopted transportation plan for jurisdiction or agency strategic plan
	Project is being considered for adoption into transportation plan or agency strategic plan
	Project is not being considered for adoption into transportation plan or agency strategic plan

Land-Use Supports Transportation Investment

Projects within each corridor to be scored based on relative number of jobs and households within ¼ mile of investment based on jurisdictions comprehensive plans

	High number of jobs and households within ¼ mile of investment
	Moderate number of jobs and households within ¼ mile of investment
	Low number of jobs and households within ¼ mile of investment

Improved Non-Motorized Travel Options (Bicycle and Pedestrian) to and within Activity Centers

Project supports multiple use development patterns in a walkable environment.

●	Project adds or extends non-motorized facility to and within activity center
◒	Project improves existing non-motorized facility to and within activity center
○	Project does not improve or provide a non-motorized facility to and within activity center

Improved Transportation System Operations to and within Activity Centers

Project encourages development to be located where it can be served by existing infrastructure.

●	Project improves operation of existing transportation system to and within activity center
◒	Project improves operation of an expanded transportation system to and within activity center
○	No improvement to operations of existing transportation system to and within activity center

Reduce Roadway Congestion

Project reduces roadway congestion.

●	Project will significantly improve traffic flow
◒	Project will moderately improve traffic flow
○	Project will have minimal to no effect on traffic flow

Safety

Project improves the safety of the transportation system.

●	Project designed to specifically improve system safety and/or address an existing safety deficiency
◒	Project will generally result in a safety improvement
○	Project will have no discernable or negative effect on safety

Cost Sharing

Project improves the private or other outside funding.

●	Project leverages private or other outside funding (e.g., tax districts, ROW donations, proffers, and/or Federal and State funds beyond/above normal allocations)
◒	Project leverages modest private or other outside funding
○	Project has no leveraged private or other outside funding

Freight Movement

Projects that improve the capacity, reliability of freight - while also improving other impacted systems such as highways or passenger rail

●	Project increases the reliability and capacity of freight and passenger rail, and improves overall highway system
◒	Project improves reliability and capacity of freight rail and passenger rail but has little or no impact on the overall system
○	Project improves freight rail capacity and reliability but has no or negative impact on passenger rail efficiencies or overall system efficiencies

Cost

Project cost for each 2030 Plan project.

4.2 Prioritized Project Lists by Corridor

This section of the TransAction 2030 Plan presents the prioritized project lists for each corridor, as well as other projects outside the major corridors. The origin of these projects was described in Section 3.1. For each corridor, projects are listed in priority order by mode. At the direction of the NVTA, projects were not prioritized across modes or corridors. These tables show the ratings of each project against the project-based performance criteria that were outlined in Section 4.1 of this Plan document. The final column in each table shows each project's priority within its mode. Note that in some cases projects are given the same priority level, such as 2nd, because it was possible that multiple projects had the same rating against the performance criteria. In cases of ties in priority ranking, projects were not further differentiated and have an equal priority.

The tables in the following subsections present the prioritized project lists by corridor. Please note that trail projects that are located on existing facilities and higher volume roadways have been ranked higher than those projects that are not located on these types of facilities. It was assumed, as per VDOT's policy for integrating bicycle and pedestrian accommodations into highway construction projects, that trail projects will be constructed as part of highway improvement projects.

4.2.1 Corridor 1: Dulles/VA 7 Corridor

Facility	Improvement	Limits	Number of Lanes		Activity Center Connection	Multimodal Choices	Person Throughput	Intermodal Connections	Management and Operations Technology	Urgency	Need for Rehabilitation	Right-of-Way (ROW)	Mode Share	Reduce VMT	Compatibility with Local Comprehensive Plans	Land-Use Supports Transportation Investment
			From	To												
Highway																
VA 606 @ VA 267 (Dulles Greenway)	widen bridge	within Dulles Greenway right-of-way	4	5	○	○	◐	○	○	◐	○	●	○	○	●	○
VA 772 @ VA 267 (Dulles Greenway)	widen bridge	within Dulles Greenway right-of-way	4	5	○	○	◐	○	○	◐	○	●	○	○	●	○
Reconstruction																
East Elden Street	reconstruct	Monroe St. to Herndon Pkwy. east	4	4	○	○	◐	◐	○	○	◐	●	○	○	●	◐
Elden St. (downtown Elden St.)	reconstruct	Center St. to Monroe St.	2	2	○	○	◐	◐	○	○	◐	●	○	○	●	◐
South Elden St.	reconstruct	Herndon Pkwy. to Sterling Rd.	4	4	○	○	◐	◐	○	○	◐	●	○	○	●	◐
Transit																
Light rail (VA 7 corridor)	construct	Tysans Corner to Baileys Crossroads/Skyline	–	–		●	●	●	○	●	○	◐	●	●	◐	●
Trail																
VA 7	construct	Leesburg to Alexandria			●	●	◐	●	○	◐	○	◐	◐	●	●	●
Dulles Toll Road	construct	Sully Road to Rte. 123	–	–		●	◐	●	○	◐	○	◐	◐	●	●	●
VA 690 (21st St.)	construct	Main Street to W&OD Trail			○	●	◐	●	○	◐	○	◐	◐	●	●	◐
VA 703 (Haycock Road)	construct	Broad Street to I-65			○	●	◐	●	○	◐	○	◐	◐	●	●	◐

Legend
- ● High Rating
- ◐ Medium Rating
- ○ Low Rating

4.2.1 Corridor 1: Dulles/VA 7 Corridor (continued)

Facility	Improvement	Limits	Number of Lanes From	Number of Lanes To	Improved Non-motorized Travel Options (Bicycle and Pedestrian) to and within Activity Centers	Improved Transportation Systems Operations to and within Activity Centers	Reduce Roadway Congestion	Safety	Cost Sharing	Freight Movement	Priority within Improvement Category
Highway											
VA 606 @ VA 267 (Dulles Greenway)	widen bridge	within Dulles Greenway right-of-way	4	6	○	○	◑	◑	○	○	1st
VA 772 @ VA 267 (Dulles Greenway)	widen bridge	within Dulles Greenway right-of-way	4	6	○	○	◑	◑	○	○	2nd
Reconstruction											
East Elden Street	reconstruct	Monroe Street to Herndon Parkway East	4	4	◑	●	○	●	○	○	1st
Elden Street (downtown Elden Street)	reconstruct	Center Street to Monroe Street	2	2	◑	●	○	●	○	○	1st
South Elden Street	reconstruct	Herndon Parkway to Sterling Road	4	4	◑	●	○	●	○	○	1st
Transit											
Light rail (VA 7 corridor)	construct	Tysons Corner to Baileys Crossroads/Skyline	–	–	○	○	●	◑	○	○	1st
Trail											
VA 7	construct	Leesburg to Alexandria			●	◑	○	●	○	○	1st
Dulles Toll Road	construct	Sully Road to Rte. 123	–	–	●	◑	○	●	○	○	2nd
VA 690 (21st St.)	construct	Main Street to W&OD Trail			●	◑	○	●	○	○	3rd
VA 703 (Haycock Road)	construct	Broad Street to I-66			●	○	○	●	○	○	5th

Legend

- ● High Rating
- ◑ Medium Rating
- ○ Low Rating

4.2.2 Corridor 2: Tri-County/Loudoun County Parkway and VA 234/VA659 Corridor

⁻acility	mprovemen	.imits	Number of Lanes ⁻ron	To	Activity Center Connection	1ultimod Choices	Person ıroughp	ıtermod ınnectio	Managemen and Operations Technology	Urgency	Need for ehabilitati	Right-of Way (ROW)	Mode Share	educ VMT	Compatibility with Local Comprehensive Plans	Land-Use Supports Transportation Investment
Highway																
VA 234 @ (Manassas Bypass)	widen/upgrade	I-66 to VA 234 south of Manassas	4	6	◑	◑	●	○	○	●	○	●	○	○	●	◑
Godwin Drive	widen	Sudley Road to VA 28	4	6	○	◑	●	○	○	●	○	●	○	○	●	◑
VA 234 interchange	construct	@VA 234 Bypass and Liberia Avenue VA 3000	–	–	○	○	●	○	○	◑	○	◑	○	○	◑	◑
Rail*																
Loudoun Parkway	construct	John Mosby Highway to Ryan Road			○	●	◑	●	○	◑	○	◑	◑	●	●	◑
Prince William Parkway	construct	Nokesville Road to Dumfries Road			○	●	◑	●	○	◑	○	◑	◑	●	●	◑
Tri-County Parkway	construct	Braddock Road to Sudley Road			○	●	◑	●	○	◑	○	◑	◑	●	●	◑
Godwin Drive	construct	Nokesville Road to Sudley Road			○	●	◑	●	○	◑	○	◑	◑	●	●	◑
Claiborne Parkway	construct	Rte. 7 to Ryan Rd.			○	●	◑	●	○	◑	○	◑	◑	●	●	◑
VA 659 (Belmont Ridge Road)	construct	Harry Byrd Highway to Evergreen Mill Rd.			○	●	◑	●	○	◑	○	◑	◑	●	●	◑

Legend
- ● High Rating
- ◑ Medium Rating
- ○ Low Rating

4.2.2 Corridor 2: Tri-County/Loudoun County Parkway & VA 234/VA659 Corridor (continued)

Facility	Improvement	Limits	Number of Lanes From	Number of Lanes To	Improved Non-motorized Travel Options (Bicycle and Pedestrian) to and within Activity Centers	Improved Transportation Systems Operations to and within Activity Centers	Reduce Roadway Congestion	Safety	Cost Sharing	Freight Movement	Priority within Improvement Category
Highway											
VA 234 (Manassas Bypass)	widen/upgrade	I-66 to VA 234 south of Manassas	4	6	○	◒	●	●	◒	○	1st
Godwin Drive	widen	Sudley Road to VA 28	4	6	○	◒	●	●	○	○	2nd
VA 234 interchange	construct	@ VA 234 Bypass and Liberia Avenue VA 3000	–	–	○	◒	●	●	○	○	3rd
Trail*											
Loudoun County Parkway	construct	John Mosby Highway to Ryan Road			●	◒	○	●	○	○	1st
Prince William Parkway	construct	Nokesville Road to Dumfries Road			●	◒	○	●	○	○	1st
Tri-County Parkway	construct	Braddock Road to Sudley Road			●	◒	○	●	○	○	3rd
Goodwin Drive	construct	Nokesville Road to Sudley road			●	◒	○	●	○	○	4th
Claiborne Parkway	construct	Rte. 7 to Ryan Road			●	◒	○	●	○	○	5th
VA 659 (Belmont Ridge Road)	construct	Harry Byrd Highway to Evergreen Mill Road			●	◒	○	●	○	○	6th

Legend

- ● High Rating
- ◒ Medium Rating
- ○ Low Rating

4.2.3 Corridor 3: VA 28 Corridor

acility	proveme	Limits	Number of Lanes		Activity Center Connection	ultimod Choices	Person roughp	termod onnectio	Management and Operations Technology	Urgency	Need for habilitati	Right-of Way (ROW)	Mode Share	educ VMT	Compatibility with Local Comprehensive Plans	Land-Use Supports Transportation Investment
			ron	To												
Highway																
Liberia Avenue	widen	VA 28 to NS	4	6	◐	◐	●	○	○	◐	○	●	○	○	●	◐
VA 28 interchange	Construct	@ Frying Pan Road	-	-	○	◐	●	○	○	◐	○	●	○	○	●	◐
VA 28 interchange	construct	@ New Braddock Road	-	-	○	○	●	○	○	◐	○	◐	○	○	●	◐
VA 28	widen	Dulles Toll Rd. to Rt. 606	6	8	○	○	●	○	○	●	○	◐	○	○	●	◐
VA 28	widen	I 66 to Fairfax Co. Line	6	8	○	○	●	○	○	●	○	◐	○	○	●	
Transit																
VRE Service	construct	Manassas to Fauquier County			○	●	●	●	○	●	○	●	●	●	◐	◐
Light rail (Rt. 28)	construct	Manassas to Dulles Airport			◐	●	●	●	○	●	○	◐	●	●	○	◐
Trail*																
VA 28 (Sully Road)	construct	Walney Road to Dulles Toll Road			◐	●	◐	●	○	◐	○	◐	◐	●	●	◐
Atlantic Boulevard	construct	Harry Byrd Highway to Church			◐	●	◐	●	○	◐	○	◐	◐	●	●	◐
VA 636 (Shaw Road)	construct	W&OD Trail to Dulles toll Road	-	-	◐	●	◐	●	○	◐	○	◐	◐	●	●	◐

Legend

- ● High Rating
- ◐ Medium Rating
- ○ Low Rating

4.2.3 Corridor 3: VA 28 Corridor (continued)

Facility	Improvement	Limits	Number of Lanes		Improved Non-motorized Travel Options (Bicycle and Pedestrian) to and within Activity Centers	Improved Transportation Systems Operations to and within Activity Centers	Reduce Roadway Congestion	Safety	Cost Sharing	Freight Movement	Priority within Improvement Category
			From	To							
Highway											
Liberia Avenue	widen	VA 28 to NS Railroad	4	6	○	◑	●	●	○	○	1st
VA 28 interchange	construct	@ Frying Pan Road	–	–	○	●	◑	●	○	○	2nd
VA 28 interchange	construct	@ New Braddock Road	–	–	○	●	◑	●	○	○	3rd
VA 28	construct	@ New Braddock Road	6	8	○	◑	●	◑	○	○	2nd
VA 28	widen	Dulles Toll Rd. to Rt. 606	6	8	○	◑	●	◑	○	○	2nd
Transit											
VRE Service	construct	Manassas to Fauquier County			○	◑	●	◑	○	●	1st
Light rail (Rt. 28)	construct	Manassas to Dulles Airport			○	◑	●	◑	○	○	2nd
Trail*											
VA 28 (Sully Road)	construct	Walney Road to Dulles Toll Road			●	◑	○	●	○	○	1st
Atlantic Boulevard	construct	Harry Byrd Highway to Church			●	◑	○	●	○	○	2nd
VA 636 (Shaw Road)	construct	W&OD Trail to Dulles Toll Road	–	–	●	◑	○	●	○	○	2nd

Legend
- ● High Rating
- ◑ Medium Rating
- ○ Low Rating

4.2.4 Corridor 4: Prince William Parkway (VA 3000) Corridor

·acility	ıproveme	Limits	Number of Lanes ·ron	To	Activity Center Connection	ultimod Choices	Person ıroughp	ıtermod onnectio	Management and Operations Technology	Urgency	Need for habilitati	Right-of Way (ROW)	Mode Share	educ VMT	Compatibility with Local Comprehensive Plans	Land-Use Supports Transportation Investment
·ighway																
Prince William Co. Parkway	widen (HOV)	HOV Lanes from Hoadley Road to I-95	4	6	○	●	●	●	○	○	○	◐	●	●	◐	◐
·ransit																
Priority Bus	implement	Woodbridge to Manassas			◐	●	●	●	●	●	○	●			●	◐

·acility	Improvement	Limits	Number of Lanes From	To	Improved Non-motorized Travel Options (Bicycle and Pedestrian) to and within Activity Centers	Improved Transportation Systems Operations to and within Activity Centers	Reduce Roadway Congestion	Safety	Cost Sharing	Freight Movement	Priority within Improvement Category
·ighway											
Prince William Co. Parkway	widen (HOV)	HOV Lanes from Hoadley Road to I-95	4	6	○	◐	●	◐	○	○	1st
·ransit											
Priority Bus	implement	Woodbridge to Manassas			○	◐	◐	◐	○	○	1st

Legend	
●	High Rating
◐	Medium Rating
○	Low Rating

4.2.5 Corridor 5: Fairfax County Parkway (VA 7100) Corridor

Facility	Improvement	Limits	Number of Lanes From	Number of Lanes To	Activity Center Connection	Multimodal Choices	Person Throughput	Intermodal Connections	Management and Operations Technology	Urgency	Need for Rehabilitation	Right-of-Way (ROW)	Mode Share	Reduce VMT	Compatibility with Local Comprehensive Plans	Land-Use Supports Transportation Investment
Trail*																
Hayfield Road	construct	Manchester Road to Telegraph Road			Low Rating	High Rating	Medium Rating	High Rating	Low Rating	Medium Rating	Low Rating	Medium Rating	Medium Rating	High Rating	High Rating	High Rating
Manchester Road	construct	Beulah Street to Hayfield Road	–	–	Low Rating	High Rating	Medium Rating	High Rating	Low Rating	Medium Rating	Low Rating	Medium Rating	Medium Rating	High Rating	High Rating	High Rating

Facility	Improvement	Limits	Number of Lanes From	Number of Lanes To	Improved Non-motorized Travel Options (Bicycle and Pedestrian) to and within Activity Centers	Improved Transportation Systems Operations to and within Activity Centers	Reduce Roadway Congestion	Safety	Cost Sharing	Freight Movement	Priority within Improvement Category
Trail*											
Hayfield Road	construct	Manchester Road to Telegraph Road			High Rating	Medium Rating	Low Rating	High Rating	Low Rating	Low Rating	1st
Manchester Road	construct	Beulah Street to Hayfield Road			High Rating	Medium Rating	Low Rating	High Rating	Low Rating	Low Rating	1st

Legend

- High Rating
- Medium Rating
- Low Rating

4.2.6 Corridor 6: I-66/US 29/US 50 Corridor

acility	Improvement	imits	Number of Lanes From	Number of Lanes To	Activity Center Connection	lultimod Choices	Person iroughp	ıtermod onnectio	Management an Operations Technology	Urgency	Need for ehabilitati	Right-of Way (ROW)	Mode Share	educ VMT	Compatibility with Loca Comprehensive Plans	Land-Use Supports Transportation Investment
ighway																
I-66	8 lanes + 2 HOV-reversible lanes	US 29 (Gainesville) to I-495	4/6/8	10	●	●	●	●	◐	●	●	●	●	◐	●	●
US 29	widen	I-495 to VA 7	4	6	○	◐	●		○	●	○	◐	○	○	●	◐
US 29	widen	Fauquier/PW Line to Virginia Oaks Drive	4	6	○	◐	●	◐	○	●	○	◐	○	○	●	◐
US 29 interchange	construct	US 15	–	–	○	○	●	○	○	●	○	◐	○	○	●	○
econstruction																
US 29 turn lanes	reconstruct	Quincy to Lexington	–	–	○	○	○	○	○	◐	●	●	○	○	●	◐
US 29/Lee Highway*	reconstruct	N. Quincy to N. Kenmore	4	4	○	○	○	○	○	◐	●	●	○	○	●	◐
US 50 – median barrier	reconstruct	N. Jackson to Fillmore Street	6	6	○	○	○	○	○	◐	●	●	○	○	●	◐
US 29 intersections (City of Fairfax)	reconstruct	Enhance priority movement at 6 intersections			○	○	○	○	○	◐	●	●	○	○	●	◐
I-66 interchange	reconstruct	@ US 29 in Centerville (possible new ramp)			○	○	◐	○	○	◐	●	●	○	○	●	◐
US 50	reconstruct intersection	I-66 to WCL Fairfax	–	–	○	○	○	○	○	○		●	○	○	●	◐
I-66 interchange	reconstruct	@ Rt. 28 (interim complete) @ Stringfellow Road @ Rt. 50 (interim complete) @ VA 123 @ Nutley Street			○	○	○	○	○	○		●	○	○	●	●

* Project completed.

Legend ● High Rating ◐ Medium Rating ○ Low Rating

4.2.6 Corridor 6: I-66/US 29/US 50 Corridor (continued)

acility	Improvement	imits	Number of Lanes		Activity Center Connection	ultimod Choices	Person roughp	ntermod nnectio	Management and Operations Technology	Urgency	Need for habilitati	Right-of Way (ROW)	Mode Share	educ VMT	Compatibility with Local Comprehensive Plans	Land-Use Supports Transportation Investment
			ror	To												
ransit																
Metrorail (I-66 corridor)	construct	Vienna to Centreville			●	●	●	●	○	●	○	●	●	●	◐	●
VRE Service Extension	construct	Manassas to Haymarket			○	●	●	●	○	◐	○	●	●	●	●	◐
Express bus service	implement	I-66 Corridor			●	●	●	●	○	●	○	●	●	●	◐	●
Priority bus (US 50)	Implement	VA 659 relocated (Loudoun) to Glebe Rd.			●	●	●	●	●	○	○	●	◐	◐	◐	●
VRE Parking Improvements	Add 2,450 parking spaces	Manassas Line			○	◐	◐	◐	○	●	○	◐	◐	●	●	◐
rail																
US 50 (Arlington Blvd.)	construct	Wilson Blvd. to Four Mile Run Trail	–	–	◐	●	◐	●	○	◐	○	◐	◐	●	●	●
US 29 (Lee Hwy.)	fill in two segments	Dixie Hill Rd. to Prosperity Blvd.			◐	●	◐	●	○	◐	○	◐	◐	●	●	◐
US 50	construct	Prosperity Blvd. to Rte. 7			◐	●	◐	●	○	◐	○	◐	◐	●	●	◐

Legend

- ● High Rating
- ◐ Medium Rating
- ○ Low Rating

4.2.6 Corridor 6: I-66/US 29/US 50 Corridor (continued)

Facility	Improvement	Limits	Number of Lanes From	Number of Lanes To	Improved Non-motorized Travel Options (Bicycle and Pedestrian) to and within Activity Centers	Improved Transportation Systems Operations to and within Activity Centers	Reduce Roadway Congestion	Safety	Cost Sharing	Freight Movement	Priority within Improvement Category
Highway											
I-66	8 lanes + 2 HOV-reversible lanes	US 29 (Gainesville) to I-495			○	◐	●	●	◐	○	1st
US 29	widen	I-495 to VA 7			○	◐	●	◐	○	○	2nd
US 29	widen	Fauquier/PW Line to Virginia Oaks Drive			○	○	●	◐	○	○	2nd
US 29 interchange	construct	US 15			○	○	●	●	○	○	4th
Reconstruction											
US 29 turn lanes	reconstruct	Quincy to Lexington			○	●	○	●	○	○	1st
US 29/Lee Highway	reconstruct	N. Quincy to N. Kenmore			○	●	○	●	○	○	1st
US 50 – median barrier	reconstruct	N. Jackson to Fillmore Street			○	●	○	●	○	○	1st
US 29 intersections (City of Fairfax)	reconstruct	Enhance priority movement at 6 intersections			○	●	○	●	○	○	1st
I-66 interchange	reconstruct	@ US 29 in Centerville (possible new ramp)			○	○	◐	●	○	○	1st
US 50	reconstruct intersection	I-66 to WCL Fairfax			○	●	◐	●	○	○	6th
I-66 interchange	reconstruct	@ Rt. 28 (interim complete) @ Stringfellow Road @ US 50 (interim complete) @ VA 123 @ Nutley Street			○	●	○	●	○	○	6th

Legend	
●	High Rating
◐	Medium Rating
○	Low Rating

4.2.6 Corridor 6: I-66/US 29/US 50 Corridor (continued)

Facility	Improvement	Limits	Number of Lanes		Improved Non-motorized Travel Options (Bicycle and Pedestrian) to and within Activity Centers	Improved Transportation Systems Operations to and within Activity Centers	Reduce Roadway Congestion	Safety	Cost Sharing	Freight Movement	Priority within Improvement Category
			From	To							
Transit											
Metrorail (I-66 Corridor)	construct	Vienna to Centreville			○	◐	●	◐	○	○	1st
VRE Service Extension	construct	Manassas to Haymarket			○	◐	●	◐	◐	●	1st
Express Bus Service	implement	I-66 Corridor			○	◐	◐	◐	○	○	3rd
Priority Bus (US 50)	Implement	VA 659 relocated (Loudoun) to Glebe Rd.			○	◐	◐	◐	○	○	4th
VRE Parking Improvements	add 2,450 parking spaces	Manassas Line			○	●	◐	◐	○	○	5th
Trail*											
US 50 (Arlington Blvd.)	construct	Wilson Blvd. to Four Mile Run Trail	–	–	●	◐	○	●	○	○	1st
US 29 (Lee Hwy.)	fill in two segments	Dixie Hill Rd. to Prosperity Blvd.			●	◐	○	●	○	○	2nd
US 50 (Arlington Blvd.)	construct	Prosperity Blvd. to Rte. 7			●	◐	○	●	○	○	3rd

Legend
- ● High Rating
- ◐ Medium Rating
- ○ Low Rating

4.2.7 Corridor 7: I-495 (Beltway) Corridor

acility	Improvement	Limits	Number of Lanes ro	To	Activity Center Connection	lultimod Choices	Person iroughp	ıtermod ınnectio	Management and Operations Technology	Urgency	Need for habilitati	Right-of Way (ROW)	Mode Share	educ VMT	Compatibility with Local Comprehensive Plans	Land-Use Supports Transportation Investment
ighway																
I-495	8 lanes + 4 HOV lanes	Woodrow Wilson Bridge to American Legion Bridge	8	12	●	●	●	●	○	●	○	◐	●	●	●	●
econstruction																
I-495 Interchange	reconstruct	@ George Washington Memorial Pkwy. @ Georgetown Pike @ Dulles Toll Road @ US 50			○	○	○	○	○	●	◐	●	○	○	●	●
ransit																
Metrorail Circumferential	construct	Dunn Loring to Bethesda (Red Line)	–	–	●	●	●	●	○	●	○	◐	●	●	●	●
Corridor-wide Express Bus	implement	I-495/I-95-Woodrow Wilson Bridge to American Legion Bridge			●	●	●	●	○	●	○	●	●	●	◐	●
rail*																
Beltway Trail (Fairfax Co.)	construct	Dolley Madison Blvd. to Live Oak Drive			◐	●	◐	●	○	◐	○	◐	◐	●	●	●
VA 617 (Backlick Rd.)	construct	Lee Highway to Capital Beltway			◐	●	◐	●	○	◐	○	◐	◐	●	●	●
Backlick Run Trail	construct	Backlick Rd. to past Clermont Ave.			◐	●	◐	●	○	◐	○	◐	◐	●	●	●
Alexandria – Local	construct	Eisenhower/Holland/ Prince/Reinekers	–	–	◐	●	◐	●	○	◐	○	◐	◐	●	●	●
Potomac Heritage Trail/ Mt. Vernon Trail	construct	Northern end of Beltway Trail to Chain Bridge			◐	●	◐	●	○	◐	○	◐	◐	●	●	○

Legend

- ● High Rating
- ◐ Medium Rating
- ○ Low Rating

4.2.7 Corridor 7: I-495 (Beltway) Corridor (continued)

Facility	Improvement	Limits	Number of Lanes From	Number of Lanes To	Improved Non-motorized Travel Options (Bicycle and Pedestrian) to and within Activity Centers	Improved Transportation Systems Operations to and within Activity Centers	Reduce Roadway Congestion	Safety	Cost Sharing	Freight Movement	Priority within Improvement Category
Highway											
I-495	8 lanes + 4 HOV lanes	Woodrow Wilson Bridge to American Legion Bridge			○	◐	●	◐	●	○	1st
Reconstruction											
I-495 Interchange	reconstruct	@ George Washington Memorial Pkwy. @ Georgetown Pike @ Dulles Toll Road @ US 50			○	●	○	●	○	○	1st
Transit											
Metrorail Circumferential	construct	Dunn-Loring to Bethesda (Red Line)			○	◐	●	◐	○	○	1st
Corridor-wide Express Bus	implement	I-495/I-95-Woodrow Wilson Bridge to American Legion Bridge			○	◐	◐	◐	○	○	2nd
Trail*											
Beltway Trail (Fairfax Co.)	construct	Dolley Madison Blvd. to Live Oak Drive			●	◐		●	○	○	1st
VA 617 (Backlick Rd.)	construct	Lee Highway to Capital Beltway			●	◐		●	○	○	2nd
Backlick Run Trail	construct	Backlick Rd. to past Clermont Ave.			●	◐		●	○	○	2nd
Alexandria – Local	construct	Eisenhower/Holland/Prince/ Reinekers			●	◐		●	○	○	4th
Potomac Heritage Trail/ Mt. Vernon Trail	construct	Northern end of Beltway Trail to Chain Bridge			●	◐		●	○	○	5th

Legend
- ● High Rating
- ◐ Medium Rating
- ○ Low Rating

4.2.8 Corridor 8: I-95/I-395/US 1 Corridor

'acility	Improvement	Limits	Number o Lanes: ror	Number o Lanes: To	Activity Center Connection	lultimod Choices	Person iroughp	ntermodi onnectio	Management anc Operations Technology	Urgency	Need for ehabilitati	Right-of Way (ROW)	Mode Share	educ VMT	Compatibility with Local Comprehensive Plans	Land-Use Supports Transportation Investment
ighway																
US 1 interchange	construct	Rippon Boulevard & Date Boulevard			○	○	●	◐	○	●	○	◐	○	○	●	●
US 1 interchange	construct	@ Fairfax County Parkway @ Huntington Ave,/Fort Hunt Rd.			○	○	●	◐	○	●	○	◐	○	○	●	●
VA 236 (Little Rvr Trnpk) interchange	construct	@ Beauregard Street			○	○	●	◐	○	●	○	◐	○	○	●	●
I-95 (SOV)	construct	Entrance to SOV Lanes at Franconia Springfield Pkway			○	○	●	●	○	◐	○	●	○	○	●	●
'ransit																
CC-PY Transitway	construct	Crystal City to Potomac Yard			◐	●	●	●	○	●	○	◐	●	●	◐	●
Metrorail	extension	Springfield to Potomac Mills			◐	●	●	●	○	●	○	◐	●	●	○	◐
VRE Parking Improvements	Add 3,150 parking spaces	Fredericksburg Line			○	◐	◐	◐	○	●	○	◐	◐	●	●	◐
'rail*																
US 1	construct	Stafford County to I-95/495			●	●	◐	●	○	◐	○	◐	◐	●	●	●
Arlington – Local	construct	Local streets along I-95 and US 1 corridor			◐	●	◐	●	○	◐	○	◐	◐	●	●	●
Alexandria – Local	construct	Local street along I-95 and US 1 corridor			◐	●	◐	●	○	◐	○	◐	◐	●	●	●
Fairfax County – Local	construct	Local streets along I-95 and US 1 corridor			◐	●	◐	●	○	◐	○	◐	◐	●	●	●
Trail along Metrorail	construct	Cameron Street to Crystal City			◐	●	◐	●	○	◐	○	◐	◐	●	●	●
VA 611 (Telegraph Road)	construct	S. Kings Highway to N. Kings Highway			◐	●	◐	●	○	◐	○	◐	◐	●	●	●
Capital Beltway Ramp	construct	I-95 to Route 1 (Richmond Hwy)			◐	●	◐	●	○	◐	○	◐	◐	●	●	◐
Potomac Heritage Trail	construct	Wharton Dr to Jefferson Davis Hwy			○	●	◐	●	○	◐	○	◐	◐	●	●	◐
Potomac Parkway	construct	Old Stage Coach Rd to New Cherry Hill Rd Trail			○	●	◐	●	○	◐	○	◐	◐	●	●	◐

Legend: ● High Rating ◐ Medium Rating ○ Low Rating

4.2.8 Corridor 8: I-95/I-395/US 1 Corridor (continued)

Facility	Improvement	Limits	Number of Lanes From	Number of Lanes To	Improved Non-motorized Travel Options (Bicycle and Pedestrian) to and within Activity Centers	Improved Transportation Systems Operations to and within Activity Centers	Reduce Roadway Congestion	Safety	Cost Sharing	Freight Movement	Priority within Improvement Category
Highway											
US 1 interchange	construct	Rippon Boulevard & Date Boulevard			○	●	●	●	◐	○	1st
US 1 interchange	construct	@ Fairfax County Parkway @ Huntington Avenue/ Fort Hunt Rd.			○	●	●	●	○	○	2nd
VA 236 (Little River Tpke.) Interchange	construct	@ Beauregard Street			○	●	●	●	○	○	2nd
I-95 (SOV)	construct	Entrance to SOV Lanes at Franconia Springfield Parkway			○	◐	◐	◐	○	○	4th
Transit											
CC-PY Transitway	construct	Crystal City to Potomac Yard			○	◐	●	◐	○	○	1st
Metrorail	extension	Springrield to Potomac Mills			○	◐	●	◐	○	○	2nd
VRE Parking Improvements	add 3,150 parking spaces	Fredericksburg Line			○	●	◐	◐	○	○	3rd
Trail*											
US 1	construct	Stafford County to I-95/495			●	◐	○	●	○	○	1st
Arlington – Local	construct	Local streets along I-95 and US 1 Corridor			●	◐	○	●	○	○	2nd
Alexandria – Local	construct	Local street along I-95 and US 1 Corridor			●	◐	○	●	○	○	2nd
Fairfax County – Local	construct	Local streets along I-95 and US 1 Corridor			●	◐	○	●	○	○	2nd
Trail along Metrorail	construct	Cameron Street to Crystal City			●	◐	○	●	○	○	5th
VA 611 (Telegraph Road)	construct	S. Kings Highway to N. Kings Highway			●	◐	○	●	○	○	6th
Capital Beltway Ramp	construct	I-95 to Route 1 (Richmond Hwy)			●	◐	○	●	○	○	7th
Potomac Heritage Trail	construct	Wharton Dr to Jefferson Davis Hwy			●	◐	○	●	○	○	8th
Potomac Parkway	construct	Old Stage Coach Rd to New Cherry Hill Rd Trail			●	◐	○	●	○	○	8th

Legend: ● High Rating ◐ Medium Rating ○ Low Rating

4.2.9 Other Major Improvements (Outside Major Corridors)

acility	mprovement	Limits	Number of Lanes ror	To	Activity Center Connection	ultimod Choices	Person roughp	ntermod nnectio	Management and Operations Technology	Urgency	Need for habilitati	Right-of Way (ROW)	Mode Share	educ VMT	Compatibility with Local Comprehensive Plans	Land-Use Supports Transportation Investment
ighway																
VA 123 interchange	construct	@ International Drive			○	○	●	○	○	●	○	◐	○	○	●	●
VA 123 interchange	construct	@ Braddock Road			○	○	●	○	○	●	○	◐	○	○	●	◐
Western Transportation Corridor	construct	I-95 in VA to I-270 in MD	–	4	○	●	●	○	○	●	○	○	○	○	◐	
US 50	widen	Middleburg to US 15	2	4	○	◐	●	○	○	●	○	◐	○	○	◐	
Eastern Potomac River Crossing	construct	I-95 (Prince William/Stafford Co.) to US 301 in Maryland	–	6	○	●	●	○	○	●	○	○	○	○	○	○
econstruction																
US 15 turn lanes/ roundabout	reconstruct	At US 50	–	–	○	○	○	○	○	○	◐	●	○	○	◐	◐
ransit																
Light rail (Columbia Pike corridor)	construct	Baileys Crossroads/Skyline to Pentagon			◐	●	●	●	○	◐	○	◐	●	●	◐	●
Priority bus (VA 236)	implement	City of Fairfax to Alexandria			●	●	●	◐	●	○	○	●	◐	◐	◐	●
rail*																
South County East-West Trail	construct	Manasses Clifton Trail to I-95 (Edsall Rd.)			●	●	◐	●	○	◐	○	◐	◐	●	◐	●
James Madison Hwy.	construct	I-66 to New Road			◐	●	◐	●	○	◐	○	◐	◐	●	◐	●
John Marshall Hwy.	construct	I-66 to Lee Hwy.			◐	●	◐	●	○	◐	○	◐	◐	●	◐	●
US 50 (Lee Jackson Hwy.)	fill in two segments	Pleasant Valley Dr. to Sulley Rd.			○	●	◐	●	○	◐	○	◐	◐	●	◐	●
VA 620 (Braddock Rd.)	construct	Guinea Rd. to Little River Turnpike			○	●	◐	●	○	◐	○	◐	◐	●	◐	●
VA 236 (Little River Tpke.)	construct	Wakefield Chapel Dr. to Van Dorn St.			○	●	◐	●	○	◐	○	◐	◐	●	◐	●
VA 123 (Ox Rd.)	construct	Clifton Rd. to Gordon Blvd.			○	●	◐	●	○	◐	○	◐	◐	●	◐	●
VA 784 (Dale Blvd.)	construct	Delaney Rd. to US 1			○	●	◐	●	○	◐	○	◐	◐	●	◐	●
VA 639 (Rolling Rd.)	construct	South County East-West Trail to I-95			○	●	◐	●	○	◐	○	◐	◐	●	◐	●
Gordon Blvd.	construct	US 1 to Commerce St.			○	●	◐	●	○	◐	○	◐	◐	●	◐	●
Holmes Run Trail	construct	Columbia Pike to Larston Dr.			○	●	◐	●	○	◐	○	◐	◐	●	◐	●
Minnieville Rd.	construct	Dumfries Rd. to Spriggs Rd.			○	●	◐	●	○	◐	○	◐	◐	●	◐	●

Legend ● High Rating ◐ Medium Rating ○ Low Rating

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4.2.9 Other Major Improvements (Outside Major Corridors)

acility	nproveme	Limits	Number of Lanes From	Number of Lanes To	Activity Center Connection	Multimod Choices	Person hroughp	ntermod nnectio	Management and Operations Technology	Urgency	Need for ehabilitati	Right-of-Way (ROW)	Mode Share	educ VMT	Compatibility with Local Comprehensive Plans	Land-Use Supports Transportation Investment
rail*																
Arlington Co.	construct	Miscellaneous			○	●	◐	●	○	◐	○	◐	◐	●	◐	●
Fairfax Co.	construct	Miscellaneous			○	●	◐	●	○	◐	○	◐	◐	●	◐	●
Loudoun Co.	construct	Miscellaneous			○	●	◐	●	○	◐	○	◐	◐	●	◐	●
Prince William County	construct	Miscellaneous			○	●	◐	●	○	◐	○	◐	◐	●	◐	●
VA 234 Bypass North (VA 705)	construct	Nokesville Rd. to Evergreen Mill Rd.			○	●	◐	●	○	◐	○	◐	◐	●	◐	◐
VA 15 (James Monroe Hwy.)	construct	Braddock Rd. to MD State Line			○	●	◐	●	○	◐	○	◐	◐	●	◐	◐
Charles Town Pike (VA 9)	construct	Harpers Ferry Rd. to Harry Byrd Hwy.			○	●	◐	●	○	◐	○	◐	◐	●	◐	◐
Lorton Rd. (Interstate Bike 1)	construct	US 1 to Ox Rd.			○	●	◐	●	○	◐	○	◐	◐	●	◐	◐
Route 734	construct	US 50 to Harry Byrd Hwy.			○	●	◐	●	○	◐	○	◐	◐	●	◐	◐
VA 287 (Berlin Tpke.)	construct	W&OD Trail to Brunswike Bridge			○	●	◐	●	○	◐	○	◐	◐	●	◐	◐
Manassas Clifton Trail	construct	Rt. 28 to South County East-West Trail			○	●	◐	●	○	◐	○	◐	◐	●	◐	◐
Old Ox Rd.	construct	Loudoun County Pkwy. to Herndon Pkwy.			○	●	◐	●	○	◐	○	◐	◐	●	◐	◐
VA 671 (Harpers Ferry Rd.)	construct	Harpers Ferry Bridge WV to Charles Town Pike			○	●	◐	●	○	◐	○	◐	◐	●	◐	◐
Fairview Ave.	construct	Center St. to Prince William Parkway			○	●	◐	●	○	◐	○	◐	◐	●	◐	◐
Aden Rd. (Interstate Bike 1)	construct	Fleetwood Dr. to Dumfries Rd.			○	●	◐	●	○	◐	○	◐	◐	●	◐	◐
Algonkian Pkwy. / Holly Knoll Rd.	construct	Harry Byrd Hwy. to Atlantic Blvd.			○	●	◐	●	○	◐	○	◐	◐	●	◐	◐
Old Bridge Rd.	construct	Prince William Pkwy to Poplar Lane			○	●	◐	●	○	◐	○	◐	◐	●	◐	◐
Spriggs Rd.	construct	Hoadly Rd. to Dumfries Rd.			○	●	◐	●	○	◐	○	◐	◐	●	◐	◐
Mt. Vernon Trail Ext.	construct	Potomac Heritage Trail to George Washington Memorial Pkwy.			○	●	◐	●	○	◐	○	◐	◐	●	◐	○
US 50	construct	Fauquier County line to Pleasant Valley Dr.			○	●	◐	●	○	◐	○	◐	◐	●	◐	○

Legend			
	● High Rating	◐ Medium Rating	○ Low Rating

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4.2.9 Other Major Improvements (Outside Major Corridors)

Facility	Improvement	Limits	Number of Lanes From	Number of Lanes To	Improved Non-motorized Travel Options (Bicycle and Pedestrian) to and within Activity Centers	Improved Transportation Systems Operations to and within Activity Centers	Reduce Roadway Congestion	Safety	Cost Sharing	Freight Movement	Priority within Improvement Category
Highway											
VA 123 interchange	construct	@ International Drive			○	●	◐	●	○	○	1st
VA 123 interchange	construct	@ Braddock Road			○	●	◐	●	○	○	2nd
Western Transportation Corridor	construct	I-95 in VA to I-270 in MD		4	○	◐	●	◐	○	○	3rd
US 50	widen	Middleburg to US 15	2	4	○		●	◐	○	○	4th
Eastern Potomac River Crossing	construct	I-95 (Prince William/Stafford Co.) to US 301 in Maryland	–	6	○	◐	●	◐	○	○	4th
Reconstruction											
US 15 turn lanes/roundabout	reconstruct	at US 50			○	◐	●	◐	○	○	1st
Transit											
Light rail (Columbia Pike corridor)	construct	Baileys Crossroads/Skyline to Pentagon			○	◐	●	◐	○	○	1st
Priority bus (VA 236)	implement	City of Fairfax to Alexandria			○	◐	●	◐	○	○	1st
Trail*											
South County East-West Trail	construct	Manassas Clifton Trail to I-95 (Edsall Rd.)			●	◐	○	●	○	○	1st
James Madison Hwy.	construct	I-66 to New Rd.			●	◐	○	●	○	○	2nd
John Marshall Hwy.	construct	I-66 to Lee Hwy.			●	◐	○	●	○	○	2nd
VA 50 (Lee Jackson Hwy.)	fill in two segments	Pleasant Valley Dr. to Sulley Rd.			●	○	○	●	○	○	4th
VA 620 (Braddock Rd.)	construct	Guinea Rd. to Little River Turnpike			●	○	○	●	○	○	4th
VA 236 (Little River Tpke.)	construct	Wakefield Chapel Dr. to Van Dorn St.			●	◐	○	●	○	○	4th
VA 123 (Ox Rd.)	construct	Clifton Rd. to Gordon Blvd.			●	○	○	●	○	○	7th
VA 784 (Dale Blvd.)	construct	Delaney Rd. to US 1			●	○	○	●	○	○	7th
VA 638 (Rolling Rd.)	construct	South County East-West Trail to I-95			●	○	○	●	○	○	7th
Gordon Blvd.	construct	US 1 to Commerce St.			●	○	○	●	○	○	7th

Legend
- ● High Rating
- ◐ Medium Rating
- ○ Low Rating

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4.2.9 Other Major Improvements (Outside Major Corridors)

Facility	Improvement	Limits	Number of Lanes From	Number of Lanes To	Improved Non-motorized Travel Options (Bicycle and Pedestrian) to and within Activity Centers	Improved Transportation Systems Operations to and within Activity Centers	Reduce Roadway Congestion	Safety	Cost Sharing	Freight Movement	Priority within Improvement Category
Trail*											
Holmes Run Trail	Construct	Columbia Pike to Larston Dr			●	○	○	●	○	○	7th
Minnieville Rd	Construct	Dumfries Rd to Old Bridge Rd			●	○	○	●	○	○	7th
Arliington County	construct	Miscellaneous			●	○	○	●	○	○	13th
Fairfax County	construct	Miscellaneous			●	○	○	●	○	○	13th
Loudoun County	construct	Miscellaneous			●	○	○	●	○	○	13th
Prince William County	construct	Miscellaneous			●	○	○	●	○	○	13th
VA 234 Bypass North (VA 705)	Construct	Braddock Rd to Lee Hwy			●	○	○	●	○	○	17th
VA 15 (James Monroe Hwy.)	Construct	Braddock Rd to James Monroe Hwy			●	○	○	●	○	○	17th
Charles Town Pike (VA 9)	Construct	Harpers Ferry Rd to Harry Bryd Hwy			●	○	○	●	○	○	19th
Lorton Rd. (US Bike 1)	Construct	US1 to Ox Rd			●	○	○	●	○	○	19th
Route 734	Construct	US50 to Harry Bryd Hwy			●	○	○	●	○	○	21st
VA 287 (Berlin Tpk.)	Construct	W&OD Trail to Brunswike Bridge			●	○	○	●	○	○	22nd
Manassas Clifton Trail	Construct	Park Center Ct to South County East-West Trail			●	○	○	●	○	○	22nd
Old Ox Rd	Construct	Old Ox Rd to Herndon Pky			●	○	○	●	○	○	22nd
VA 671 (Harpers Ferry Rd)	Construct	Harpers Ferry Bridge WV to Charles Town Pike			●	○	○	●	○	○	22nd
Fairview Ave.	Construct	Center St to Oakview Dr			●	○	○	●	○	○	26th
Aden Rd. (Bike Rt. 1)	Construct	Fleetwood Dr to Dumfries Rd			●	○	○	●	○	○	26th
Algonkian Pkwy	Construct	Harry Byrd Hwy to Unnamed 5			●	○	○	●	○	○	26th
Old Bridge Rd	Construct	Prince William Pky to Poplar Lane			●	○	○	●	○	○	26th
Spriggs Rd	Construct	Hoadly Rd to Dumfries Rd			●	○	○	●	○	○	26th
Mt. Vernon Trail Ext.	Construct	Potomac Heritage Trail to George Washington Memorial Pky			●	○	○	●	○	○	31st
US 50	Construct	Fauquier County Line to Pleasant Valley Dr			●	○	○	●	○	○	32nd

4.3 Intelligent Transportation Systems (ITS)

Northern Virginia is a region that innovates, develops, and uses technology to improve everyone's quality of life. Transportation stakeholders in the region have used this technology to improve the effectiveness of transportation services in Northern Virginia.

Within a transportation framework, Intelligent Transportation Systems (ITS) is the program area that uses technology to improve transportation. "Intelligent Transportation Systems" means electronics, communications, or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system. An ITS project means any project that in whole or in part funds the acquisition of technologies or systems of technologies that provide or significantly contribute to the provision of one or more ITS user services as defined in the National ITS Architecture. Major ITS project means any ITS project that implements part of a regional ITS initiative that is multi-jurisdictional, multi-modal, or otherwise affects regional integration of ITS systems.

Intelligent Transportation Systems are one component of an overall transportation strategy for the region. ITS by itself does not create new capacity or reduce congestion; instead, ITS helps to manage capacity, optimize the use of the transportation network, and support transportation and emergency response services.

All stakeholders in the Northern Virginia region have made use of ITS and continue to expand and program additional ITS projects.

Over the years, ITS has evolved. ITS was first identified as a program under the 1991 ISTEA legislation, with funds provided for certain earmarked prjects, along with discretionary funds provided to the states for use in specific activities such as development of ITS Early Deployment Plans. ITS funding was expanded in 1996 TEA-21 legislation, with an emphasis on demonstrations and "Operational Tests" of ITS technologies, and more discretion allowed for states to determine uses of the funds. Under original federal legislation, ITS had separate dedicated funding streams to deploy and demonstrate the effectiveness of technology solutions. Deployment of technology projects led to a number of lessons learned and modifications to how transportation agencies plan, manage, maintain, and operate technical systems.

Under the most recent federal legislation, ITS projects are mainstreamed – meaning that these technology projects no longer have a separate dedicated funding stream and must compete with all other transportation projects for funding. (Federal earmarks and funding for research and development still exist for state and local transportation stakeholders.)

In addition to mainstreaming ITS project funding, transportation agencies are increasing their use of systems engineering approaches to transportation projects. These systems engineering practices help provide better project management and deployment for technology based projects. Technology changes quickly. In the amount of time that it takes to develop, plan, fund, and deploy a single project, the technology originally specified for that project may no longer be commercially available. Systems engineering approaches that specify functional requirements rather than specific technology have better success by being able to use the best technology available at the time of project deployment.

In support of the Systems Engineering Process, FHWA and FTA jointly issued Rule 940, which requires that metropolitan areas conform with a structured planning process in order to be eligible for Federal ITS funds. In conjunction with Rule 940, the National ITS Architecture was develop to give structure, requirements, and functions for inclusion in ITS project planning. The National ITS Architecture provides recommended guidance on ITS deployment. States and localities have been tailoring the National ITS Architecture into Regional ITS Architectures to reflect local needs and local conditions. The Regional ITS Architectures are a tool to help define how projects and services fit together. The architecture is also a roadmap for deployment against which progress may be measured.

The Northern Virginia Region has two regional ITS Architectures that are mutually compatible. The first is the Northern Virginia Regional ITS Architecture developed by the Virginia Department of Transportation (VDOT). The second is the Metropolitan Washington Region ITS Architecture developed by the Metropolitan Washington Council of Governments.

The Northern Virginia Regional ITS Architecture is a VDOT centric architecture. This architecture views the region from VDOT's perspective and is used primarily by VDOT for project planning. Other transportation stakeholders can use this Regional Architecture to assure that VDOT and the stakeholders are in agreement on how the stakeholders related to each other.

The Metropolitan Washington Region ITS Architecture takes a high-level, regional perspective anddescribes how all regional entities relate to each other. This architecture includes Northern Virginia, the District of Columbia, the Federal Government, and Maryland. By comparison, the VDOT NOVA ITS Architecture focuses on those interconnects and data flows that specifically involve VDOT, and describes those at a more detailed level than the Washington Region Architecture. Both Architectures are compatible, and the VDOT NOVA Architecture provides a more detailed picture of portions of the Washington Region Architecture.

In order to receive Federal Funding, a project must demonstrate that it is consistent and conformant with the National ITS Architecture and that it follows the System Engineering Process. Projects can demonstrate consistency and conformance by being reflected in VDOT NOVA Architecture. If stakeholders involved interact with VDOT, or by being reflected in the Washington Region Architecture, if stakeholders involved include the stakeholders for that Architecture.

ITS at a national level has changed to meet evolving needs. The US Department of Transportation's ITS Program now includes fewer, larger, high-risk, high-payoff initiatives. The nine major initiatives are:

- Integrated Vehicle-based Safety Systems
- Cooperative Intersection Collision Avoidance Systems
- Next Generation 911
- Integrated Corridor Management Systems
- Mobility Services (including social service transit coordination)
- CLARUS (weather information data sharing)
- Emergency Transportation Operations
- Universal Electronic Freight Manifests
- Vehicle Infrastructure Integration

State and local transportation stakeholders are deploying ITS projects while monitoring the progress of these national initiatives. When the US DOT has succeeded in completing a specific milestone or component of one of these initiatives, state and local stakeholders will consider if that milestone or component addresses local transportation needs and incorporate that component into ITS project plans.

VDOT is the largest transportation stakeholder in the region and performs extensive planning and deployment of ITS. Other stakeholders have taken advantage of VDOT planning and developed their own specific ITS plans to meet their needs, leveraging off VDOT's work, and coordinating with other stakeholders. VDOT and the region have developed a transportation vision supported by specific goals and objectives.

Vision

Integrated deployment of ITS to optimize transportation services, supporting a secure multimodal transportation system that improves quality of life and customer satisfaction by ensuring a safer and less congested transportation network.

This concept envisions specific activities organized around a few key areas of activity:

- Managing traffic
- Managing incidents
- Providing real-time information to users
- Managing infrastructure
- Encouraging and improving transit and multimodal use
- Unified toll operations

Goals and objectives are derived from the vision to provide clear direction for project planning. For each goal, system objectives further clarify the intent of the vision.

Table 7 ITS Goals and Objectives

Objectives	Strategies
Goal 1: Enhance Public Safety	
1.A Minimize Incidents	■ Reduce crashes on freeways and surface streets: VDOT NOVA will implement safety improvement projects that promote a higher quality of life for the residents and visitors of Virginia.
	■ Integrate with “sources” of incident information, such as CAD systems, to speed incident detection and response (CAD Integration).
	■ Minimize and manage impacts to safety and mobility in construction and maintenance work zones.
1.B Respond Efficiently to Incidents	■ Maintain a robust Safety Service Patrol (SSP) Program.
	■ Improve and expand detection capability through new technologies, partnerships, and improvements to existing systems.
	■ Coordinate and cooperate across jurisdictional and agency lines using technology and best practices.
1.C Improve Transportation Security	■ Protect critical infrastructure in the NOVA region such as bridges and choke points.
	■ Efficiently communicate and cooperate with local and regional jurisdictions regarding critical incidents and evacuation routing, especially those incidents regarding the National Capitol Region.
	■ Efficiently share accurate and timely travel condition, roadway closure, routing, and other information with the public during emergency transportation operations.
	■ Effectively manage evacuating traffic travel through the NOVA roadway network during emergency transportation operations using contra flow, suspension of tolls, transit, etc.
Goal 2: Enhance Public Safety	
2.A Operate the Transportation System Effectively and Efficiently	■ Improve communication and coordination of agency activities: VDOT NOVA will share information on and coordinate with planned and ongoing activities within the Agency and with other agencies.
	■ Maximize the use of the transportation system capacity to move traffic. Detailed traffic and roadway conditions data are vital for VDOT NOVA to assess the performance of the roadway network and allow them to be more proactive in managing the roadways for the public.
	■ Improve and maintain traffic flow on surface streets: Develop a balanced signal system operation approach that is time, evident and conditions-sensitive.

Table 7 ITS Goals and Objectives (continued)

Objectives		Strategies
2.A	Operate the Transportation System Effectively and Efficiently (Cont'd.)	■ Proactively monitor and assess the condition of the freeway, primary, and secondary road system in real-time regarding: safety, congestion, travel information, incident detection/response, traffic volume, speed, and capacity.
		■ Follow the NOVA operations business process model to effectively integrate traditional traffic engineering and emerging ITS solutions to produce "quick implement" projects that deliver immediate or near-term results.
		■ Improve the process for outcome-based project planning and implementation: Measurement of project development will help VDOT NOVA gauge the deployment of its programs and track the successful operation of systems. This information can be used to replicate NOVA successes elsewhere in Virginia.
		■ Timely mobilize/demobilize and improve overall efficiency of snow operations. ■ Effectively identify hot spots and develop tactical and operational adjustments to improve service delivery and efficiency.
2.B	Enhance District Operations and Maximize the Effectiveness and Efficiency of Personnel, Equipment and Resources	■ Improve intra-agency cooperation by implementing the NOVA Operations Business Process Model: The complex operations of the VDOT NOVA District require close coordination among the offices within NOVA. Information sharing is crucial for maintaining the coordinated operation of disparate work groups.
		■ Improve inter-agency cooperation: VDOT NOVA is a public organization with a significant influence on the operation of local and other state agencies. VDOT NOVA will support the forums through which they and other agencies share information.
		■ Improve efficiency in tracking of resources: The enormous inventory that VDOT NOVA works with must be effectively managed so that resources can be shared when needed, requisitions can be filed based on need, and the maintenance of all NOVA resources can be tracked.
		■ Utilize performance-oriented standards for system and field device operations wherever feasible; e.g., VMS are operable at least X% of the time. ■ Ensure that ITS projects are implemented on time and on budget.
2.C	Expand ITS Infrastructure to Enable Corridor Management	■ Implement coordinated, corridor-level traffic management on key freeway segments and adjacent arterial streets.
		■ Ensure that a robust inspection and maintenance program is in place that is results-based and focused on condition assessment and operability of a variety of ITS systems and devices, including telecommunications. Special emphasis will be placed on system compatibility, life cycle, and achieving tangible results.

Table 7 ITS Goals and Objectives (continued)

Objectives	Strategies
2.C Expand ITS Infrastructure to Enable Corridor Management (Cont'd.)	■ Expand the geographic coverage of ITS infrastructure on the NOVA arterial and freeway transportation system, including but not limited to ITS and traffic signal systems, freeway lighting system, CCTV system, variable message boards, incident detection system, condition monitoring system, vehicle classification system, ramp-metering system, gate control system, lane control system and others.
Goal 3: Make the Transportation System User Friendly	
3.A Enhance and Simplify VDOT NOVA Interactions with Travelers	■ Improve customer service: VDOT NOVA will ensure that its customers receive the services they request promptly and to their satisfaction. VDOT NOVA will strive to decrease the amount of time it takes to respond to citizens inquires.
	■ Simplify payment for transportation services: VDOT NOVA will support a common payment system for transportation services, so that it is easier for customers who use various modes of transportation.
3.B Support Traveler Information Services	■ Improve roadway network information dissemination: Provide information to travelers via appropriate media with the right message to the right audience. In many instances, private enterprise will be more capable of packaging information that the public will desire. NOVA shall leverage cooperation opportunities with the private sector to ensure that customers get the best quality and timely traffic information.
	■ Effectively provide data and facilitate multi-modal real-time traffic information for the public so that all travelers may select the most effective mode, route and travel time choices.
	■ Support comprehensive traveler information services by coordinating with other agencies in disseminating parking, tourism, and transit information. ■ In cooperation with other agencies, increase the speed with which incidents are identified and communicated to travelers so that travelers can modify their travel plans as appropriate.
Goal 4: Enable Cross-Cutting Activities to Support Goals 1-3	
Enhance Mobility Using Technology	■ Reduce travel time and improve schedule reliability for buses and HOV carpool and vanpool users: VDOT NOVA supports the use of multi-occupancy vehicles and will maximize operations of HOV and general purpose lane facilities.
	■ Reduce demand on the roadway network, primarily during peak hours: VDOT NOVA will work toward promoting other modes of travel and spreading demand so that the use of single occupancy vehicles is reduced, and peak congestion is reduced. ■ Improve pedestrian and special needs accessibility along major arterials by retrofitting pedestrian facilities in rapidly urbanizing areas.

Table 7 ITS Goals and Objectives (continued)

Objectives		Strategies
4.B	Create a 21st Century Foundation for Operations	■ *Integrated ITS Deployment* – Facilitate integrated and systems-engineering based-ITS and Transportation management in the NOVA and Washington Metropolitan Region so as to minimize “after thoughts” ITS investments.
		■ *Knowledge building* – Bridge the ITS Program Teams’ knowledge and skill gap in order to improve performance and deliver the program effectively, to leverage investment from the academic and private sectors in order to improve ITS program performance.
		■ *Project Identification* – Develop, maintain, and assess an ITS and traffic engineering project pool to identify candidate projects that contribute to safe and efficient traffic flow. Determine work plan and funding requirements/ sources including earmarks, CMAQ, SPR, soSYP, and iSYP. ■ *Mainstreaming of ITS* – Relying less upon Federal ITS earmark funding, ensure that ITS projects are considered as part of regular planning processes and incorporated appropriately into traditional construction and maintenance projects.
4.C	Conduct a Strategic Research and Development Program	■ Continue to track USDOT ITS program direction, including the nine ITS initiatives, and reflect in the NOVA ITS program as appropriate (e.g., consider field operational test funding opportunities).
		■ Coordinate with local research universities and research institutions to develop new, beneficial technologies and technology applications. ■ Strategize research priorities and initiatives based on VDOT NOVA local needs as well as VDOT statewide and industry direction.

Technologies for Intelligent Transportation Systems evolve and change very quickly. Every year, new systems and components are available that provide new and different capabilities in monitoring, managing, and operating the transportation network. In order to take advantage of technologies as they mature, transportation stakeholders should take a slightly different approach towards ITS strategic planning. Rather than trying to identify technology projects over a 20 year time frame, the stakeholders should divide the planning horizon into three separate but related timeframes.

The first time frame defines specific projects for implementation within the next five years. The second time frame defines functional requirements that should be addressed in years six through ten. The third time frame identifies transportation goals to be met in years eleven through twenty. Under this approach, projects can be defined using the latest technology. Projects can be developed without forcing the project to use technology that will be outdated by the time it is implemented, and strategic planning can be performed to achieve the goals for the future.

Table 8 illustrates the desired ITS projects drawn from stakeholders in the region, and includes enhancements and expansion of field device coverage, central software and telecommunications backbone, and many others.

Table 8 Planned ITS Projects in the Region

ITS Projects	Project Cost
Interstate ITS	
Replace, Upgrade and Expand Coverage of ITS Field Devices	$7,150,000
Enhance Existing Central Software/Implement New Central Software	$2,200,000
Enhance, Upgrade and Expand Telecommunication Backbone	$1,000,000
Primary Roadway ITS	
Enhance Operational Capability on Primary System (Software & Devices)	$4,400,000
Enhance, Upgrade and Expance Telecommunications Backbone	$1,540,000

* Dollars are annual averages over a six year planning period and are rounded off.
Source: Virginia Department of Transportation.

4.4 Public Involvement and Telephone Survey Inputs

One of the major goals for the TransAction 2030 Plan was to develop a list of projects that will receive priority funding. The technical aspects of the study were accompanied by an extensive effort to seek out the preferences of the public as to which should receive attention, how improvements should be funded, and commuter's habits. NVTA, which is responsible for preparing a regional transportation plan for Northern Virginia, directed an innovative, informative, and comprehensive approach in pursuing public input.

As the Northern Virginia study area includes the counties of Arlington, Fairfax, Loudoun, and Prince William and the cities of Alexandria, Fairfax, Falls Church, Manassas, and Manassas Park, the outreach effort covered a vast geographical area consisting of diverse populations. The demographics, culture, and lifestyles of residents were considered in designing and implementing the comprehensive public outreach plan. The NVTA chose a program that would seek out the opinions of typical and actual users of the existing roads, rails, and trails in their home surroundings.

Team members reached out to baby-boomers, young adults, senior citizens, and other underrepresented populations throughout the spring and summer of 2005 at community festivals and events sponsored by their own jurisdictions. During other periods of the study, team members were busy sampling the public's opinion through an independent and scientific telephone survey, comment forms inserted into an educational newsletter, and an informal, online public survey and corridor ballot exercise available on the project website, www.transaction2030.

Fact sheets about the eight regional travel corridors, a telephone hotline, and an informative online PowerPoint presentation provided further mechanisms to reach out into the community and advocate that residents “take action” by becoming involved with planning and prioritizing future transportation investments. Relevant materials were translated into Spanish—the most predominant non-English speaking minority. Citizens’ comments, ballots, and views have been integrated into a *Public Involvement Final Report*, as well as a *Comment Summary Report*, and a *Public Opinion Survey Final Report* accessible from the project website. An open house and public hearing was held on December 6, 2005 to afford citizens one last opportunity to view the results of the technical analysis and provide their input. The following is a summary of the key activities completed.

Regional Telephone Survey

In an effort to reach out and communicate with a broad cross-section of Northern Virginians, an independent and scientific telephone survey was conducted between April 26 and May 10, 2005. QSA Research & Strategy, a professional polling and research firm conducted the survey. The survey was administered within the counties of Arlington, Fairfax, Loudoun and Prince William, and the cities of Alexandria, Falls Church, Fairfax, Manassas, and Manassas Park, with 1,263 respondents.

The objective of the telephone survey was to assess citizens’ commuting patterns, means of travel and transportation corridors most often used, priorities for improvements within those corridors and in deciding where to live, and how much respondents would be willing to pay (on average each day) to have their highest priority project built. The survey results showed that half of the respondents chose public transportation as their top priority improvement, while one-quarter chose road improvements. Below are the key findings of the telephone survey.

- Key findings included:
- 85% of the respondents were willing to pay to expand public transportation and reduce crowding on Metro and VRE
- 7 in 10 stated that they were willing to pay to use HOT lanes
- 70% of the respondents would vote for state bonds backed by state income taxes to pay for all types of transportation improvements in Northern Virginia
- 60% of those who travel the Route 7/Dulles Corridor chose extending Metrorail to Dulles Airport and Ashburn in Loudoun County as their top priority

- 46% of those traveling the Prince William County Parkway Corridor chose widening the Parkway as their top priority
- 43% of those traveling the I-495 Corridor chose extending Metrorail from Dunn Loring to Maryland while 42% chose widening the Beltway
- 39% of those traveling the I-66 Corridor selected widening I-66 outside the Beltway while 31% selected extending Metrorail to Centreville
- 38% of those interested in the proposed Tri-County Parkway chose Route 234 North Bypass, while 27% selected Tri-County Parkway from Route 234 to Route 50
- 37% of those traveling the Fairfax County Parkway Corridor selected widening the Parkway as their top priority
- 34% of those traveling the Route 28 Corridor selected Widening Route 28 from Manassas Park to Route 29, while 31% selected light rail from Manassas to Dulles
- 29% of those traveling the I-95 Corridor chose extending Metrorail to Potomac Mills while 21% chose widening Route 1 to Stafford

Community Events

Between May and August 2005, project members sought out community members at their spring and summer community festivals. On the citizens' turf, the team educated the public about TransAction 2030 and canvassed people on their opinions of proposed transportation improvements in the eight major corridors within Northern Virginia. Team members were out in force in the communities listening, learning, and receiving community input.

A TransAction 2030 booth was set up and staffed at each community event. The booth had the following materials available to the public:

- Project newsletter
- Fact sheets for each corridor detailing TransAction 2030 Plan and 2030 CLRP projects in each corridor
- Fact sheets describing the travel demand modeling, multimodal corridor evaluation and project prioritization methodologies
- Large-scale map showing key projects in each corridor, and key projects outside the corridors

- Ballot sheets for each corridor for citizens to vote on projects
- Project contact information
- Children activity sheets

Community Events – Balloting

At the community events, as well as online, citizens were invited to prioritize projects in the eight corridors. Eight separate ballot sheets were available, one for each of the major corridors in Northern Virginia. Several projects were listed for each corridor with the option of voting for the 1st, 2nd and 3rd choice – in the order of their most important priority for funding. Of the 2,324 visitors to the TransAction 2030 project booths, 71% or 1,645 persons, took the time to complete one or more corridor ballots. Table 9 highlights the number of visitors and ballot sheets completed at each of the community events. Of all the jurisdictions, the highest participation came from the citizens of Arlington County with 512 visitors and 562 completed ballots. *Note: Each person could complete up to eight ballots, one for each corridor.*

Table 9 TransAction 2030 Community Events

Community Event	Date	Visitors to Booth	Ballots Completed
City of Falls Church Memorial Day Festival	May 31, 2005	147	52
Celebrate Fairfax	June 10 – 12, 2005	373	267
24th Annual Alexandria Red Cross Waterfront Festival	June 18-19, 2005	405	234
City of Fairfax 4th of July Celebration	July 4, 2005	200	101
Prince William County Fair	August 13 – 20, 2005	403	229
Arlington County Fair	August 19 – 21, 2005	512	562
Leesburg/Loudoun County's August Court Days	August 20 – 21, 2005	284	200
Total		2,324	1,645

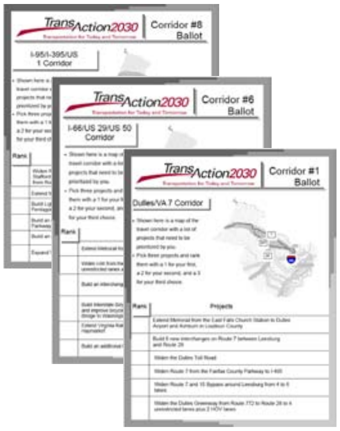

Table 10 is a summary of the 1,645 ballots completed during the community events. Corridors in the table are listed in descending order according to the total number of votes for that corridor. The projects within the corridors are listed in descending order as well, according to the total number of votes for each project. For example, the I-66/ US 29/US 50 Corridor was first with a total of 1374 votes. The proposed project to extend Metrorail from Vienna to Centreville is listed first with a total of 392 votes, 203 for the first, 115 for the second, and 74 for the third choice.

Key findings included:

- 496 participants completed the I-66/US 29/US 50 Corridor Ballot
- 372 participants completed the Dulles/VA 7 Corridor Ballot
- 312 participants completed the I-95/I-395/US 1 Corridor Ballot
- 392 participants identified extending Metrorail from Vienna to Centreville as one of their top three priorities
- 319 participants identified extending Metrorail from the East Falls Church Station to Dulles Airport and Ashburn in Loudoun County as one of their top three priorities
- 308 participants identified widening I-66 from the Beltway to Gainesville, add 2 unrestricted lanes and 2 reversible HOV lanes as one of their top three priorities
- 233 participants identified extending Metrorail from Springfield to Potomac Mills as one of their top three priorities

Project Website

The TransAction 2030 project website was designed to provide project information to citizens 24 hours a day, seven days a week and to provide an opportunity for those citizens who were unable to visit the information booth at the community events to participate in the ballot activity. The website included a project overview, downloadable PowerPoint presentation, educational information, a calendar of community events, online survey and corridor ballots, comment form, and project schedule. The project website was publicized through three press releases, a newsletter, distribution of project business cards at community events, and multiple email broadcasts.

Table 10 Ballot Sheets Summary Report of all Community Events

For any of the following eight corridors, pick three projects and rank them with a 1 for your first choice, a 2 for your second, and a 3 for your third.

Project	Choices 1st	2nd	3rd	Total
I-66/US 29/US 50 Corridor (496 Participants)				
Extend Metrorail from Vienna to Centreville	203	115	74	392
Widen I-66 from the Beltway to Gainesville, add 2 unrestricted lanes and 2 reversible HOV lanes	124	111	73	308
Build an interchange on I-66/Route 29 (Gainesville)	41	59	104	204
Build Interstate Bicycle Route 50 through Northern Virginia and improve bicycle connections across the Theodore Roosevelt Bridgeto Washington, D.C.	66	75	54	195
Extend Virginia Railway Express (VRE) from Manassas to Haymarket	22	77	95	194
Build an additional Metrorail entrance to Rosslyn Station	29	23	29	81
				1374
Dulles/VA 7 Corridor (372 Participants)				
Extend Metrorail from the East Falls Church Station to Dulles Airport and Ashburn in Loudoun County	264	28	27	319
Build 6 new interchanges on Route 7 between Leesburg and Rte 28	22	77	61	160
Widen Route 7 from the Fairfax County Parkway to I-495	26	70	48	144
Widen the Dulles Toll Road	18	61	50	129
Widen Route 7 and 15 Bypass around Leesburg from 4 to 6 lanes	35	43	38	116
Widen the Dulles Greenway from Route 772 to Route 28 to 4 unrestricted lanes plus 2 HOV lanes	6	14	35	55
				923
I-95/I-395/US 1 Corridor (312 Participants)				
Extend Metrorail from Springfield to Potomac Mills	131	56	46	233
Build High Capacity Transit along Route 1 from Alexandria to the Pentagon	61	75	39	175
Increase frequency of Virginia Railway Express (VRE) service	14	60	63	137
Widen Route 1 to 6 unrestricted lanes from the Stafford County line to I-495 and increase transit service from Route 235 to I-495	49	32	49	130
Build an additional HOV/HOT lane on I-395	36	43	42	121
Build an entrance to SOV lanes at Franconia-Springfield Parkway	14	26	35	75
				871
I-495 Corridor (174 Participants)				
Extend Metrorail from the Dunn Loring Station to Maryland through Tysons Corner	75	72	18	165
Start a corridor-wide express bus service	29	51	68	148
Widen the Beltway to 8 unrestricted lanes plus four HOV or HOT lanes from I-395 to the Dulles Toll Road	66	30	42	138
				451

Table 10 Ballot Sheets Summary Report of all Community Events (Continued)

For any of the following eight corridors, pick three projects and rank them with a 1 for your first choice, a 2 for your second, and a 3 for your third.

Project	Choices 1st	2nd	3rd	Total
VA 28 (including Dulles Airport) Corridor (89 Participants)				
Build a light rail line from Manassas to Dulles Airport	32	16	24	72
Widen Route 28 from Manassas Park to Route 29 to 6 lanes	30	20	21	71
Widen Route 28 from the Dulles Toll Road to Route 606	15	31	13	59
Extend the Route 28 bike and pedestrian trail from Route 29 to the Fauquier County Line	10	12	14	36
				238
Fairfax County Parkway Corridor (81 Participants)				
Widen the Fairfax County Parkway to 6 lanes from Sunrise Valley Drive to Route 123	32	18	10	60
Build 2 new HOV lanes on the Franconia-Springfield Parkway from the Fairfax County Parkway to Frontier Drive	10	20	26	56
Start a new priority bus service that travels in a special lane and is not delayed by traffic congestion	23	15	12	50
Build 3 new interchanges on Monument Drive, Rolling Road and Pohick Road	14	16	14	44
				210
Tri-County/Loudoun County Pkwy & VA 234/VA 659 Corridor (76 Participants)				
Build a new 4 to 6 lane Tri-County Pkwy from Route 234 to Route 50	29	20	11	60
Build a new 4-lane Loudoun County Pkwy from Route 50 to the Dulles Greenway	15	12	20	47
Build a new 4-lane Loudoun County Pkwy from Route 7 to Gloucester Pkwy	6	10	13	29
Build a new 4-lane North Bypass on Route 234 from I-66 to Route 659	23	24	11	29
				165
Prince William County Parkway (VA 3000) Corridor (44 Participants)				
Start a new priority bus service from Woodbridge to Manassas	16	10	16	42
Widen Prince William County Pkwy to 6 lanes from Liberia Ave to Minnieville Road	19	6	12	37
Build HOV lanes on Prince William Pkwy from Hoadly Road to I-95	8	22	7	37
				116

An online presentation was posted on the project website to educate and entice community members to participate in planning Northern Virginia's transportation future for the next 25 years. The presentation was offered in two formats: Adobe pdf text file and Macromedia Flash. The flash version provided animation and sound and ran approximately ten minutes in length. The presentations described the vision mapped out by Northern Virginia's elected officials, challenges ahead, the existing 2020 Plan, and the intent of the 2030 Plan update. It also urged citizens to complete the online survey.

Corridor Ballots – Online

In addition to the community events, corridor ballots were available on the project website through September 28, 2005, which enabled citizens to participate in the prioritization activity at their leisure. A project business card advertising the TransAction 2030 website was distributed to community members who were unable to visit the information booth, particularly parents balancing balloons and toddlers' strollers. They were pleased to be able to catch up on project happenings and cast their ballots online in the convenience of their homes or offices. A total of 987 ballots were completed online. *Note: A cookie detector was programmed into the online ballots in an attempt to prevent a visitor from stuffing the ballots. If the system detected a returning cookie, viewers received a message stating that they had already voted and the system blocked them from voting again.*

Key findings include:

- 357 participants completed the Dulles/VA 7 Corridor Ballot
- 144 participants completed the I-66/US 29/US 50 Corridor Ballot
- 112 participants completed the I-495 Corridor Ballot
- 109 participants completed the I-95/I-395/US 1 Corridor Ballot
- 225 participants identified widening the Dulles Toll Road as one of their top three priorities
- 198 participants identified extending Metrorail from the East Falls Church Station to Dulles Airport and Ashburn in Loudoun County as one of their top three priorities
- 95 participants identified extending Metrorail from Vienna to Centreville as one of their top three priorities
- 93 participants identified widening I-66 from the Beltway to Gainesville, add 2 unrestricted lanes and 2 reversible HOV lanes as one of their top three priorities
- 93 participants identified extending Metrorail from the Dunn Loring Station to Maryland through Tysons Corner as one of their top three priorities
- 90 participants identified starting a corridor-wide express bus service as one of their top three priorities.

Public Survey - Online

Between May 25, 2005 and September 28, 2005, 278 citizens participated in the TransAction 2030 Online Public Survey. The online survey provided an opportunity for the public to participate in a similar activity as the public telephone opinion polling conducted between April 26 and May 10, 2005. The online questions were a subset of the polling questions, with the inclusion of two values questions focusing on personal and social benefits.

The key highlights included:

- 48% of the respondents selected having more choices of different ways to make a trip as being more important to them personally than saving time (41%) or saving money (11%)
- 41% would build or expand public transportation as a means of improving transportation in Northern Virginia
- 37% of the respondents identified the use of a gas tax as an acceptable means for funding transportation projects in the region over tolls (29%), sales tax (17%), raise transit fares (10%) or income tax (7%).

Newsletter

In an effort to reach a large segment of the Northern Virginia population, a project newsletter was prepared and distributed to approximately 3,235 community representatives. The newsletter was published prior to the community events to inform the public about TransAction 2030 and publicize public participation opportunities and avenues (i.e., project website, INFO line, community events, and public meeting). The newsletter was also distributed to local/regional libraries for display purposes, and was available at the community events.


TransAction2030
Transporte para Hoy y Mañana
En esta publicación:

An electronic version of the newsletter was posted on the website for easy downloading by citizens. A translated version in Spanish was also posted to the project website and made available at the community events.

The newsletter included a comment form designed to solicit feedback from citizens on which corridors they travel, their frequency, purpose and duration of travel, preferred mode of travel, preferred transportation improvement for Northern Virginia, and acceptable options for funding improvements. A total of 121 comment forms were completed.

Trends Among Comment Venues

Citizens provided their thoughts and opinions about TransAction 2030 through numerous public involvement venues and at different times throughout the project. The venues included the regional telephone survey, online public survey, corridor ballots (provided at spring/summer community events and online), and comment forms (inserted into the project newsletters).

The community event and online ballot exercises provided citizens with an opportunity to prioritize transportation improvements. The regional telephone survey identified respondents' commuting patterns, means of travel and transportation corridors most used, priorities for corridor improvements, and how much they would be willing to pay to get their highest priority project built.

The online public survey provided citizens with an opportunity similar to the regional telephone survey, although smaller in scope and not scientifically conducted. Comment forms, included in the project newsletters, solicited input from citizens on which corridors they traveled and why, preferred method of travel, frequency, and acceptable options for funding.

Priority Projects within Corridors

- **Dulles/VA7** – Community event participants and regional telephone survey respondents selected Extending Metrorail from East Falls Church into Loudoun County as their clear top priority.
- **I-66/US 29/US 50** – Community event participants selected Extending Metrorail from Vienna to Centreville and Widening I-66 from the Beltway to Gainesville, adding 2 unrestricted lanes and 2 reversible HOV lanes as their first and second priorities. Telephone survey respondents agreed with the choices but reversed the priority order.
- **I-95/I-395/US 1 Corridor** – Community event and telephone survey respondents agreed that the first priority in the I-95/I-395/US 1 Corridor is Extending Metrorail from Springfield to Potomac Mills. While community event participants indicated Building High Capacity Transit along Route 1 from Alexandria to the Pentagon as their second priority, telephone survey respondents indicated this as their third priority. Widening Route 1 to Six Unrestricted Lanes from the Stafford County line to I-495 and adding two HOV lanes was telephone survey respondents' second priority, although the percentage of respondents was very close.
- **I-495 (Beltway) Corridor** – Extending Metrorail from the Dunn Loring station to Maryland through Tysons Corner was a priority for both community event and telephone survey participants. However, telephone survey respondents were almost

equal in their support for Widening the Beltway to eight unrestricted lanes plus four HOV or HOT lanes from I-395 to the Dulles Toll Road. Community event participants supported Starting a corridor-wide express bus service as their second choice.

- **Other Corridors** – Route 28 telephone respondents selected Widening Route 28 from Manassas Park to Route 29 and Building a light rail line from Manassas to Dulles Airport, followed by Widening Route 28 from the Dulles Toll Road to Route 606 as their top priorities. Community event participants agreed with the three projects, but reversed their first and second choices.
- **Fairfax County Parkway** – After Widening the Parkway from Sunrise Valley Drive to Route 123, Fairfax County Parkway users/telephone respondents indicated Building new interchanges on Monument Drive, Rolling Road, and Pohick Road and Starting a New Priority Bus System as equally important.

When offered as an option, in the telephone survey, Metrorail was favored as a transportation solution. Of the four corridors offering extension of Metrorail as a project option (Dulles/VA7, I-66/US29/US50, I-95/I-395/US1, and I-495 corridors) the public chose Metrorail as a top priority in three of four corridors. Only among I-66 corridor users, in the telephone survey, is road widening outside the Beltway selected over extending Metrorail.

Online public survey participants also selected Metrorail or VRE as their most preferred form of transportation to use. Additionally, building and expanding public transportation was the first choice when questioned how to improve transportation in Northern Virginia. Comment form respondents indicated *Metro* as their most appealing form of transportation, followed by *Driving* as second.

In circumferential corridors, respondents favored road improvements. Users of the Fairfax County Parkway indicated in the telephone survey that their highest priority is *Widening the Fairfax County Parkway to six lanes from Sunrise Valley Drive to Route 123*. Community event participants also agree with this choice as their highest priority.

In Prince William County, telephone respondents' top priority is *Widening the Prince William County Parkway to Six Lanes from Liberia Avenue to Minnieville Road*. Community event participants confirmed this selection as their second highest priority and *Starting a New Priority Bus Service from Woodbridge to Manassas* as a first priority.
For the Tri-County Parkway Corridor (which includes the Loudoun County Parkway, Route 234 or Route 659 in Loudoun and Prince William Counties), the top priority for telephone respondents is *Building a New Four-Lane North Bypass on Route 234 from I-66 to Route 659. Building a New Four to Six Lane Tri-County Parkway from Route 234 to Route 50* was their second highest priority and community event participants' first priority.

Frustration with Trip-Making

Sixty-two percent of the respondents to the online public survey indicate they are *somewhat or very frustrated* in thinking about the types of trips they make most frequently. Respondents to the regional telephone survey agree as results indicate that two-thirds of the residents are *frustrated* with the trips they take and of those, almost nine in ten cited frustrations with *traffic* as the reason.

Funding Alternatives

Although there was general agreement among venues with regard to project priorities within corridors, Metrorail, road improvements in circumferential corridors, and frustration with travel, the public suggests several different revenue generating options. Respondents to the online public survey chose a gas tax as their option to fund transportation projects in the region, while comment form respondents were almost evenly spread between tolls and a gas tax. Residents included in the regional telephone survey indicated the sales tax is more acceptable than a gas tax among revenue generating options. Additionally, seven in ten residents would vote for state bonds paid for by state income taxes to pay for all types of transportation improvements in Northern Virginia.

INFO Line (1-888-710-2030)

A toll free INFO line was initiated early in the study and continued to be an easy and accessible venue for community members throughout the duration of the project. Citizens were asked to leave comments, have questions answered, and receive a project status during normal business hours. On weekends and after business hours, a recorded message announced upcoming events, the availability of the project website, and recorded messages from callers.

Open House and Public Hearing

On December 6, 2005, the NVTA conducted an open house and public hearing to share the results of the yearlong study and to receive additional input from the pubic. This event was held at George C. Marshall High School in Falls Church, VA. This location was chosen due to its easy access to Metrorail. The open house was held between 5:00 and 7:00 p.m., at which time citizens could view displays, informational materials, and a project video for background information. Citizens could also speak one-on-one with project staff and staff from participating agencies.

A formal presentation on the technical findings was conducted at 6:00 p.m. and 7:00 p.m. followed by a question and answer session. Citizens who wanted to make an oral comment as part of the official record could do so at the public hearing held at 7:30 p.m. Court reporters were available to record the public comments and questions. In addition, sign language and Spanish interpreters were available to assist the public as needed.

Approximately 49 citizens attended the meeting and 12 citizens provided formal comments during the public hearing. A copy of the presentation was posted to the project website. Citizens were encouraged to submit public comments via email or in writing. Ninety-eight comments were received between December 6 and 30, 2005.

Summary Brochure

A twelve-page summary brochure was produced to assist the public in understanding the results of the technical analyses and the corresponding relationship among area population, employment, housing, and transportation. The brochure included information and graphics on current and future highway and transit system performance, an explanation of the multi-modal system analysis used in updating the 2030 Plan, and a brief summary of the multi-modal improvements. In addition, information was presented on the cost estimates and funding necessary to implement these improvements. Citizens could also view a large pull out map of the Northern Virginia region with the list of proposed projects by major transportation corridors. Ten thousand copies of the brochure were produced for distribution to the project mailing list, local libraries and community centers, elected officials, government agencies, and major activity centers.

5

Cost Estimates for TransAction 2030 Plan Projects

5.1 Cost Estimation Methodology

The capital and operating cost estimates for the TransAction 2030 projects were derived from a variety of sources including the Northern Virginia 2020 Transportation Plan, VDOT 2002 unit cost data and cost estimates provided by Northern Virginia transportation agencies and jurisdictions. All costs presented in this Plan were inflated to represent 2005 dollars based on Engineering News Record historical national average construction cost indices.

Highway capital cost estimates include contingencies and ROW. Maintenance costs are presented as yearly estimates. Highway operations costs are not included.

Transit project capital cost estimates include ROW. Operating and maintenance costs are presented as yearly estimates and assume conservatively low farebox recovery factors.

Trail capital costs were derived using VDOT-supplied unit costs for on-road ($25,000/mile) and off-road facilities ($250,000). ROW, maintenance and operations costs were not estimated.

All cost estimates were based on the best available data and information and were reviewed by the Interim Technical Committee and TransAction 2030 Subcommittee.

5.2 Corridor Cost Summaries

Table 11 presents a corridor capital cost summary. Following the tables are the detailed TransAction 2030 Plan cost estimates by corridor. These detailed tables also include the final priority ranking on each project within its mode and corridor.

Table 11 Corridor Capital Cost Summary

Corridor	Highway Capital Costs	Transit Capital Costs	Trail Capital Costs	Total Capital Costs
Dulles/VA 7	$11,896,000	$936,624,000	$7,412,000	$955,932,000
Tri-County Parkway/Loudoun County Parkway/VA 234/VA 659	287,174,000	0	7,647,000	294,821,000
VA 28	157,295,000	1,505,960,000	670,000	1,663,925,000
Prince William Parkway	62,300,000	2,454,000	736,000	65,490,000
Fairfax County Parkway	0	8,880,000	1,510,000	10,390,000
I-66/US 50/US 29	1,028,965,000	1,431,044,650	4,462,000	2,464,471,650
I-495 Beltway	2,152,800,000	1,953,485,116	2,707,000	4,108,992,116
I-95/I-395/US 1	312,600,000	1,812,500,000	10,843,000	2,135,943,000
Other	3,506,830,000	197,079,000	25,022,000	3,728,931,000
Total	**$7,519,860,000**	**$7,848,026,766**	**$61,00,900**	**$15,428,895,766**

Corridor 1: Dulles/VA 7 Corridor

Facility	Improvement	Limits	Number of Lanes From	Number of Lanes To	Priority within Improvement Category	Highway Capital Cost	Highway Maintenance Cost per Year (incremental)	Transit Capital Cost	Transit Operating & Maintenance Cost per Year	Trail Capital Cost
Highway										
VA 606 @ VA 267 (Dulles Greenway)	widen bridge	within Dulles Greenway right-of-way	4	6	1st	$2,300,000	$7,300			
VA 772 @ VA 267 (Dulles Greenway)	widen bridge	within Dulles Greenway right-of-way	4	6	2nd	$2,300,000	$7,300			
Reconstruction										
East Elden Street	reconstruct	Monroe St. to Herndon Pkwy. east	4	4	1st	$4,300,000	$0			
Elden Street (downtown Elden Street)	reconstruct	Center St. to Monroe St.	2	2	1st	$576,000	$0			
South Elden Street	reconstruct	Herndon Pkwy. to Sterling Rd.	4	4	1st	$2,420,000	$0			
Transit										
Light rail (VA 7 corridor)	construct	Tysons Corner to Baileys Crossroads/ Skyline	–	–	1st			$936,624,000	4,189,000	
Trail										
VA 7	construct	Leesburg to Alexandria			1st					$3,830,000
Dulles Toll Road	construct	Sully Road to Memorial Highway	–	–	2nd					$3,441,000
Four Mile Run Trail	construct	Shirlington Road to Glebe Road			3rd					$124,000
VA 690	construct	Main Street to W&OD Trail			3rd					$5,000
VA 703 (Haycock Road)	construct	Broad Street to I-66			5th					$12,000
					Cost Totals:	$11,896,000	$14,600	$936,624,000	$4,189,000	$7,412,000

Corridor 2: Tri-County/Loudoun County Parkway and VA 234/VA 659 Corridor

-acility	Improvement	.imits	Number of Lanes From	Number of Lanes To	Priority within Improvement Category	Highway Capital Cost	Highway Maintenance Cost per Year (incremental)	Transit Capital Cost	Transit Operating & Maintenance Cost per Year	Trail Capital Cost
ighway										
VA 234 (Manasses Bypass)	widen/upgrade	I-66 to VA 234, south of Manassas	4	6	1st	$201,174,000	$468,000			
Godwin Drive	widen	Sudley Road to VA 28	4	6	2nd	$20,000,000	$27,300			
VA 234 Interchange	construct	@ VA 234 Bypass and Liberia Avenue VA 3000	–	–	3rd	$66,000,000	$19,500			
rail*										
VA 234 (Dumfries Road)	construct	Dumfries Road to Jefferson Davis Highway			1st					$3,757,000
Loudoun County Parkway	construct	John Mosby Highway to Ryan Road			2nd					$955,000
Prince William Parkway	construct	Nokesville Road to Dumfries Road			2nd					$881,000
Tri-County Parkway	construct	Braddock Road to Sudley Road			4th					$1,273,000
Godwin Drive	construct	Nokesville Road to Sudley Road			5th					$556,000
Claiborne Parkway	construct	Loudoun County Parkway Trail to Ryan Road			6th					$14,000
VA 659 (Belmont Ridge Road)	construct	Harry Byrd Highway to Ryan Road			7th					$174,000
VA 772 (Ryan Road)	construct	Belmont Ridge Road to Ryan Road			7th					$37,000
					Cost Totals:	$287,174,000	$514,800			$7,647,000

Corridor 3: VA 28 Corridor

Facility	Improvement	Limits	Number of Lanes From	Number of Lanes To	Priority within Improvement Category	Highway Capital Cost	Highway Maintenance Cost per Year (incremental)	Transit Capital Cost	Transit Operating & Maintenance Cost per Year	Trail Capital Cost
Highway										
Liberia Avenue	widen	VA 28 to NS Railroad	4	6	1st	$10,100,000	$15,600			
VA 28 Interchange	construct	@ Frying Pan road	–	–	2nd	$66,000,000	$19,500			
VA 28 interchange	construct	@ New Braddock Road	–	–	2nd	$66,000,000	$19,500			
VA 28	widen	Dulles Toll Road to Route 606	6	8	2nd	$7,350,000	$11,700			
VA 28	widen	I-66 to Fairfax County Line	6	6	2nd	$7,845,000	$39,000			
Transit										
VRE Service Extension	construct	Manasses to Fauquier County Line (includes full extension)			1st			$65,000,000	$1,000,000	
Light Rail (Route 28)	construct	Manassas to Dulles Airport			2nd			$1,440,960,000	$6,440,000	
Trail*										
VA 28 (Sully Road)	construct	Walney Road to Dulles Toll Road			1st					$196,000
Atlantic Boulevard	construct	Harry Byrd Highway to Church Road			2nd					$84,000
VA 636 (Shaw Road)	construct	W&OD Trail to Dulles Toll Road	–	–	2nd					$390,000
					Cost Totals:	$157,295,000	$105,300	$1,505,960,000	$7,440,000	$670,000

Corridor 4: Prince William Parkway (VA 3000) Corridor

Facility	Improvement	Limits	Number of Lanes		Priority within Improvement Category	Highway Capital Cost	Highway Maintenance Cost per Year (incremental)	Transit Capital Cost	Transit Operating & Maintenance Cost per Year	Trail Capital Cost
			From	To						
Highway										
Prince William County Parkway	widen (HOV)	HOV Lanes from Hoadly Road to I-95	4	6	1st	$62,300,000	$220,800			
Transit										
Priority Bus	implement	Woodbridge to Manasses			1st			$2,454,000	$1,051,000	
Trail										
Liberia Avenue	construct (fill in gaps)	Old Bridge Road to Jefferson Davis Highway			1st					$17,000
Prince William Parkway	construct	Prince William Parkway to Signal Hill Road	–	–	2nd					$719,000
					Cost Totals:	$62,300,000	$220,800	$2,454,000	$1,051,000	$736,000

Corridor 5: Fairfax County Parkway (VA 7100) Corridor

Facility	Improvement	Limits	Number of Lanes		Priority within Improvement Category	Highway Capital Cost	Highway Maintenance Cost per Year (incremental)	Transit Capital Cost	Transit Operating & Maintenance Cost per Year	Trail Capital Cost
			From	To						
Transit										
VA 7100 Priority Bus		Corridor-wide			1st			$8,880,000	$4,150,000	
Trail										
VA 7100 (Fairfax County Parkway)	construct (fill in gaps)	Monument Drive to Lee Chapel Road	–	–	1st					$1,149,000
Franconia-Springfield Parkway	construct	Loisdale Road to Beulah Street			2nd					$38,000
Hayfield Road	construct	Manchester Road to Telegraph Road			3rd					$252,000
Manchester Road	construct	Beulah Street to Hayfield Road			3rd					$71,000
					Cost Totals:			$8,880,000	$4,150,000	$1,510,000

Corridor 6: I-66/US 29/US 50 Corridor

Facility	Improvement	Limits	Number of Lanes From	Number of Lanes To	Priority within Improvement Category	Highway Capital Cost	Highway Maintenance Cost per Year (incremental)	Transit Capital Cost	Transit Operating & Maintenance Cost per Year	Trail Capital Cost
Highway										
I-66	8 lanes + 2 HOV-reversible lanes	US 29 (Gainesville) to I-495	4/6/8	10	1st	$650,025,000	$745,200			
US 29	widen	I-495 to VA 7	4	6	2nd	$26,500,000	$117,000			
US 29	widen	Fauquier/PW Line to Virginia Oaks Drive	4	6	2nd	$27,900,000	$132,600			
US 29 Interchange	construct	US 15	–	–	4th	$66,000,000	$19,500			
Reconstruction										
US 29 turn lanes	reconstruct	Quincy to Lexington	–	–	1st	$2,190,000	$0			
US 29/Lee Highway	reconstruct	North Quincy to North Kenmore	4	4	1st	$2,180,000	$0			
US 50 – Median Barrier	reconstruct	North Jackson to Fillmore Street	6	6	1st	$2,500,000	$0			
US 29 Intersections (City of Fairfax	reconstruct	Enhance priority movement at 6 intersections			1st	$5,200,000	$0			
I-66 Interchange	reconstruct	@ US 29 in Centreville (possible new ramp)			1st	$101,600,000	$0			
US 50	reconstruct intersection	I-66 yo WCL Fairfax	–	–	6th	$870,000	$0			
I-66 Interchange	reconstruct	@ Route 28 (interim complete) @ Stringfellow Road @ US 50 (interim complete) @ VA 123 @ Nutley Street			6th	$144,000,000	$0			

Corridor 6: I-66/US 29/US 50 Corridor (continued)

Facility	Improvement	Limits	Number of Lanes		Priority within Improvement Category	Highway Capital Cost	Highway Maintenance Cost per Year (incremental)	Transit Capital Cost	Transit Operating & Maintenance Cost per Year	Trail Capital Cost
			From	To						
Transit										
Metrorail (I-66 Corridor)	construct	Vienna to Centreville			1st			$1,111,439,950	$11,195,416	
VRE Service Extension	construct	Manasses to Haymarket			1st			$280,600,000	$4,000,000	
Express Bus Service	implement	I-66 Corridor			3rd			$989,000	$215,000	
Priority Bus (US 50)	implement	VA 659 relocated (Loudoun) to Glebe Road			4th			$3,015,700	$2,115,900	
VRE Parking Improvements	add 2,450 parking spaces	Manassas Line			5th			$35,000,000	$140,000	
Trail										
US 50 (Arlington Blvd.)	construct	Wilson Blvd. to Nottingham St.	–	–	1st					$2,231,000
VA 237 (Fairfax Dr.)	construct	Glebe Rd. to Washington Blvd.			2nd					$27,000
Wilson Blvd.	construct	Wilson Blvd. to Key Bridge			2nd					$14,000
Clarendon Blvd.	construct	Wilson Blvd. to Washington Blvd.			2nd					$36,000
US 29 (Lee Highway)	fill in two segments	Dixie Hill Rd. to Vitch St.			2nd					$1,903,000
US 50 (Arlington Blvd.)	construct	Nutley St. to Arlington Blvd.			6th					$143,000
I-66	construct	Sully Rd. to near Paddington Lane			6th					$108,000
					Cost Totals:	$1,028,965,000	$1,014,300	$1,431,044,650	$17,666,316	$4,462,000

Corridor 7: I-495 (Beltway) Corridor

Facility	Improvement	Limits	Number of Lanes From	Number of Lanes To	Priority within Improvement Category	Highway Capital Cost	Highway Maintenance Cost per Year incremental	Transit Capital Cost	Transit Operating & Maintenance Cost per Year	Trail Capital Cost
Highway										
I-495	8 lanes + 4 HOV lanes	Woodrow Wilson Bridge to American Legion Bridge	8	12	1st	$2,037,600,000	$1,740,000			
Reconstruction										
I-495 Interchange	reconstruct	@ George Washington Memorial Parkway @ Georgetown Pike @ Dulles Toll Road @ US 50			1st	$115,200,000	$0			
Transit										
Metrorail Circumferential	construct	Dunn Loring to Bethesda (Red Line)	–	–	1st			$1,952,219,116	$15,673,582	
Corridor-wide Express Bus	implement	I-495/I-95-Woodrow Wilson Bridge to American Legion Bridge			2nd			$1,266,000	$201,0	
Trail										
Beltway Trail (Alexandria)	construct	Wilson Bridge to Route 1 (Richmond Hwy.)			1st					$193,000
Beltway Trail (Fairfax Co.)	construct	Dolley Madison Blvd. to Live Oak Dr.			1st					$766,000
VA 617 (Backlick Rd.)	construct	Lee Hwy. to Capital Beltway			3rd					$166,000
Backlick Run Trail	construct	Backlick Rd. to past Clermont Ave.			3rd					$1,157,000
Alexandria – Local	construct	Eisenhower/Holland/Prince/Reinekers	–	–	5th					$193,000
Potomac Heritage Trail	construct	Northern end of Beltway Trail to American Legion Bridge			6th					$232,000
					Cost Totals:	$2,152,800,000	$1,740,000	$1,953,485,116	$15,874,582	$2,707,000

Corridor 8: I-95/I-395/US 1 Corridor

Facility	Improvement	Limits	Number of Lanes From	Number of Lanes To	Priority within Improvement Category	Highway Capital Cost	Highway Maintenance Cost per Year incremental	Transit Capital Cost	Transit Operating & Maintenance Cost per Year	Trail Capital Cost
Highway										
US 1 Interchange	construct	Rippon Boulevard and Dale Boulevard			1st	$66,000,000	$19,000			
US 1 Interchange	construct	@ Fairfax County Parkway @ Huntington Avenue/Fort Hunt Road			2nd	$132,000,000	$39,000			
VA 236 (Little River Tpke.) Interchange	construct	@ Beauregard Street			2nd	$66,000,000	$19,500			
I-95 (SOV)	construct	Entrance to SOV Lanes at Franconia Springfield Pkwy.			4th	$48,600,000	$10,000			
Transit										
CC-PY Transitway	construct	Crystal City to Potomac Yard			1st			$277,500,000	$11,500,000	
Metrorail	extension	Springfield to Potomac Mills			2nd			$1,500,000,000	$13,984,000	
VRE Parking Improvements	add 3,150 parking spaces	Fredericksburg Line			3rd			$35,000,000	$180,(	
Trail										
US 1	construct	Stafford County to I-95/I-495			1st					$2,476,000
Arlington – Local	construct	Local streets along I-95 and US 1 Corridor			2nd					$339,000
Alexandria – Local	construct	Local streets along I-95 and US 1 Corridor			2nd					$90,000
Fairfax County – Local	construct	Local streets along I-95 and US 1 Corridor			2nd					$1,389,000
Trail along Metrorail	construct	Cameron Street to Crystal City			5th					$620,000
VA 611 (Telegraph Road)	construct	Richmond Highway to Kings Highway			6th					$2,271,000
Capital Beltway Ramp	construct	I-95 to Route 1 (Richmond Highway)			7th					$127,000
Potomac Heritage Trail	construct	Wharton Drive to Jefferson Davis Highway			8th					$3,041,000
Potomac Parkway	construct	Old Stage Coach Road to New Cherry Hill Road Trail			8th					$490,000
					Cost Totals:	$312,600,000	$88,000	$1,812,500,000	$25,664,000	$10,843,000

Other Major Improvements (Outside Major Corridors)

Facility	Improvement	Limits	Number of Lanes From	Number of Lanes To	Priority within Improvement Category	Highway Capital Cost	Highway Maintenance Cost per Year incremental	Transit Capital Cost	Transit Operating & Maintenance Cost per Year	Trail Capital Cost
Highway										
VA 123 Interchange	construct	@ International Drive			1st	$66,000,000	$19,500			
VA 123 Interchange	construct	@ Braddock Road			2nd	$66,000,000	$19,500			
Western Transportation Center	construct	I-95 in VA to I-270 in MD		4	4th	$1,974,400,000	$5,460,000			
US 50	widen	Middleburg to US 15	2	4	5th	$34,560,000	$312,000			
Eastern Potomac River Crossing	construct	I-95 (Prince William/Stafford Co.) to US 301 in MD	–	6	5th	$1,215,000,000	$2,484,000			
Reconstruction										
US 15 turn lanes/roundabout	reconstruct	At US 50			1st	$870,000				
Transit										
Light Rail (Columbia Pike Corridor)	construct	Baileys Crossroads/Skyline to Pentagon			1st	$150,000,000		$195,000,000	$4,800,00	
Priority Bus (VA 236)	implement	City of Fairfax to Alexandria			1st			$2,079,000	$1,459,00	
Trail										
South County East-West Trail	construct	Manassas Clifton Trail to I-395			1st					$4,439,000
James Madison Highway	construct	I-66 to New Road			2nd					$2,083,000
John Marshall Highway	construct	I-66 to Lee Highway			2nd					$536,000
VA 123 (Chain Bridge Road)	fill in 3 segments	South Fairfax City Trail to Old Dominion Dr.			4th					$162,000
US 50 (Lee Jackson Highway)	fill in 2 segments	Pleasant Valley Dr. to Jermantown Rd.			4th					$102,000
VA 620 (Braddock Road)	construct	Guinea Rd. to Little River Tunpike			4th					$329,000
VA 27 (Washington Blvd.)	construct	Arlington Blvd. to Columbia Pike			4th					$211,000
VA 236 (Little River Tpke.)	construct	Wakefield Dr. to Van Dorn St.			4th					$355,000
VA 123 (Ox Road)	construct	Clifton Road to Gordon Blvd.			9th					$1,779,000
VA 784 (Dale Blvd.)	construct	Delaney Road to US 1			9th					$1,304,000
VA 638 (Rolling Road)	construct	South County East-West Trail to I-95			9th					$800,000
Gordon Blvd.	construct	US 1 to Commerce Street			9th					$373,000
Holmes Run Trail	construct	Columbia Pike to Larston Drive			9th					$308,000
Minnieville Road	construct	Dumfries Road to Old Bridge Road			9th					$215,000
George Mason Drive	construct	Old Dominion Dr. to Four Mile Run Dr.			9th					$147,000

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Other Major Improvements (Outside Major Corridors) (continued)

Facility	Improvement	Limits	Number of Lanes		Priority within Improvement Category	Highway Capital Cost	Highway Maintenance Cost per Year incremental	Transit Capital Cost	Transit Operating & Maintenance Cost per Year	Trail Capital Cost
			From	To						
Arlington County	construct	Miscellaneous			16th					$149,000
Fairfax County	construct	Miscellaneous			16th					$729,000
Loudoun County	construct	Miscellaneous			16th					$727,000
Prince William County	construct	Miscellaneous			16th					$413,000
VA 234 Bypass North (VA 705)	construct	Braddock Road to Lee Highway			20th					$1,578,000
Linton Hall Road	construct	Lee Highway to Nokesville Road			20th					$1,463,000
VA 15 (James Monroe Highway)	construct	Braddock Road to James Monroe Hwy.			20th					$515,000
Charles Town Pike (VA 9)	construct	Harpers Ferry Road to Harry Byrd Hwy,			23rd					$247,000
Lorton Road (US Bike 1)	construct	US 1 to Ox Road			23rd					$262,000
Route 734	construct	US 50 to Harry Byrd Highway			25th					$366,000
Loudoun County Parkway	construct	Ryan Road to W&OD Trail			25th					$1,031,000
VA 287 (Berlin Turnpike)	construct	W&OD Trail to Brunswike Bridge			27th					$815,000
Manassas Clifton Trail	construct	Park Center Ct. to South County East-West Trail			27th					$498,000
Old Ox Road	construct	Old Ox Road to Herndon Parkway			27th					$189,000
VA 671 (Harpers Ferry Road)	construct	Harpers Ferry Bridge WV to Charles Town Pike			27th					$187,000
Fairview Avenue	construct	Center Street to Oakview Drive			31st					$355,000
New Cherry Hill Road	construct	Potomac Heritage Trail to Potomac Parkway Trail			31st					$339,000
Aden Road (Bike Route 1)	construct	Fleetwood Drive to Dumfries Road			31st					$157,000
Algonkian Parkway	construct	Harry Byrd Highway to Unnamed 5			31st					$138,000
Old Bridge Road	construct	Prince William Parkway to Poplar Lane			31st					$128,000
Spriggs Road	construct	Hoadly Road to Dumfries Road			31st					$117,000
Mt. Vernon Trail Ext.	construct	Potomac Heritage Trail to George Washington Memorial Parkway			37th					$1,199,000
US 50	construct	Fauquier County Line to Pleasant Valley Dr.			37th					$424,000
					Cost Totals:	3,506,830,000	$8,295,000	$197,079,000	$6,259,000	$25,169,000

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6

Study Conclusions and Next Steps

6.1 Study Conclusions

The TransAction 2030 Transportation Plan described in this document represents an update of the regional transportation plan that was produced in 1999. The Transportation Coordinating Council (TCC) of Northern Virginia adopted the Northern Virginia 2020 Transportation Plan on December 16, 1999. The 2020 Transportation Plan ultimately identified a wide range of multimodal and technology transportation system improvements in response to the following Plan goals:

1. Provide an Integrated, Multimodal Transportation System
2. Provide Responsive Transportation Service to Customers
3. Respect Historical and Environmental Factors
4. Recognize the Linkage between Transportation and Land Use
5. Incorporate the Benefits of Technology
6. Identify Funding and Legislative Initiatives Needed to Implement the Plan
7. Enhance NOVA Relationships

The vision, goals and strategies adopted by the Transportation Coordinating Council (TCC) in 1999 for the 2020 Transportation Plan were used as the basis for the TransAction 2030 Plan. Specifically, the TransAction 2030 study updated the previous 2020 Transportation Plan in the following respects:

- 2030 became the horizon year as opposed to 2020
- Metropolitan Washington Council of Government's (MWCOG) Round 6.4a regional land use forecasts were used; the 2020 Plan used Round 6.1

- MWCOG's 2004 Constrained Long Range Plan (CLRP) travel demand model was used to analyze future years; the 2020 Plan used the travel demand model current at that time
- 2020 Transportation Plan project lists were updated to reflect projects that had been completed or added to the region's CLRP
- No new transportation projects beyond those identified in the 2020 Transportation Plan were evaluated
- Cost estimates for TransAction 2030 projects were updated to 2005 dollars and revised based on currently-available studies and information
- A project prioritization procedure was developed and applied to help decision-makers prioritize TransAction 2030 projects
- Transit and highway system level of service (LOS) was explicitly determined; the 2020 Plan only presented highway LOS
- A state-of-the-art Multimodal Corridor LOS procedure was applied to evaluate the eight multimodal corridors in Northern Virginia
- A scientific telephone survey was conducted to provide data on the concerns and priorities of Northern Virginia's citizens

A comprehensive set of system-level performance criteria was developed to evaluate the benefits of adding the TransAction 2030 Plan projects. These criteria were related to the transportation planning objectives established for this study and utilized data that was available from this study. The objectives were used to measure the performance of the entire transportation system with all of the projects working together as a whole.

The impacts of implementation of the TransAction 2030 projects are summarized below in terms of the five system-level objectives established for this study.

Provide an Integrated Multimodal Transportation System

- The TransAction 2030 Plan network provides a 72% increase in intermodal transfer stations over the current 2005 network. The number of Metrorail stations will double as a result of the Metrorail extensions along I-95, I-66 and Dulles Access Road corridors, and the VA Route 7, VA Route 28, Crystal City-Potomac Yard Transitway, and the Columbia Pike LRT or BRT lines add up to 54 transfer stations.
- The TransAction 2030 Plan includes an additional 600 miles of on-road and off-road trails beyond the 2030 CLRP projects, resulting in a dramatic 100% increase in trail mileage.
- The number of park and ride lots that were projected to reach capacity dropped from 26 in 2030 CLRP and 19 in 2005 to 16. This was due to significantly increased transit

capacity that reduced demand for park and ride lots in the I-66 and I-95/395 corridors.

Improve Personal Mobility

- Highway mileage operating under one hour or more of stop-and-go conditions under the 2030 CLRP network drops by approximately two-thirds with the addition of all TransAction 2030 highway and transit projects.
- Screenline Volume/Capacity (V/C) under the TransAction 2030 Plan generally decreases relative to 2030 CLRP conditions. All of the screenlines have a V/C ratio of approximately 1.0 (LOS C), which indicates acceptable and stable travel speeds on the roadways. The lone exception to this pattern is the Potomac River screenline, which is projected to have a V/C ratio between 1.4 and 1.7 (LOS E or F), which is indicative of a screenline that is approaching its capacity.
- Metrorail operating conditions remain constant along the Dulles Corridor and Orange lines under the TransAction 2030 Plan network as compared to the 2030 CLRP network. As a result of significant projected transit ridership growth, both the CLRP and TransAction Plan networks show worsening crowding conditions on the segments in downtown D.C., as compared to 2005. Assessment is needed to understand capacity constraints and further identify improvements in support of ridership growth. Without additional improvements to Metrorail capacity, the Blue Line extension in the TransAction Plan will affect level of service on the existing Blue Line segments.
- LOS results for VRE under the TransAction 2030 Plan network are very similar to the 2030 CLRP results, with the exception that the Manassas Line goes from LOS C under the 2030 CLRP network to LOS D between the Rolling Road and Alexandria stations under the TransAction 2030 network. This is due to increased ridership on the Manassas Line caused by the extensions to Nokesville and Haymarket. Increased turn-back and express trains should be examined.
- The TransAction 2030 Plan outperforms the 2030 CLRP since a smaller proportion of vehicle miles of travel (VMT) falls into LOS G, which indicates stop and go conditions for one hour or more.

Improve Personal Accessibility

- The TransAction 2030 Plan will improve personal accessibility by approximately 5% to 33% above the 2030 CLRP. The improvement is greatest with personal accessibility via transit, given the fact that a significant amount of transit projects will be constructed under the TransAction 2030 Plan scenario. Accessibility was measured as the average number of jobs within 45 minutes of households via auto and transit.

- Personal accessibility estimates of disadvantaged households via auto and transit in each jurisdiction show a similar pattern.

Improve Transportation – Land Use Linkage

- The TransAction 2030 Plan will significantly increase HOV and transit usage between many of the activity centers.
- The TransAction 2030 Plan will result in decreased VMT per capita in Arlington and Alexandria and increased VMT per capita in Loudoun, Fairfax and Prince William Counties.
- Door-to-door transit and auto travel times between activity centers improves by at least one LOS grade for over 50% of the activity center-to-activity center combinations.
- Service frequency and hours of service between activity centers improved by at least one LOS grade for over 25% of the activity center-to-activity center combinations.
- Under the TransAction 2030 Plan scenario, 61% of the region's transit-supportive areas would be served by transit (LOS D), compared to 68% (LOS D) in 2005 and 51% (LOS E) in the CLRP scenario.

Protect the Environment

- The TransAction 2030 Plan will result in decreased vehicle emissions in Arlington and Alexandria due to decreased vehicle miles of travel on all roadway types.
- Emissions effects are less definitive for the other jurisdictions and would need to be quantified by air quality modeling.

6.2 Next Steps

Adoption of the TransAction 2030 Plan represents the first step in making TransAction 2030's vision a reality. More work is needed to secure funding for the highest priority improvements recommended in the Plan. Next steps include the following:

- Share TransAction 2030 findings with the General Assembly
- Use TransAction 2030 Plan as input to upcoming Metropolitan Washington Constrained Long Range Plan (CLRP) updates
- Conduct additional Northern Virginia discussion on funding
- Incorporate TransAction 2030 Plan into Virginia's long range statewide transportation plan
- Update jurisdictions' comprehensive plans

- Continue to identify and evaluate new projects
- Perform more detailed analyses for projects as they are brought forward for preliminary planning and environmental studies

Glossary

Context Sensitive Roadway Design : Highway design process that seeks to integrate highway design into communities with objectives of safety, mobility, enhancement of the natural environment, and preservation of community values.

Cutlines: Imaginary lines across multiple transportation facilities in a corridor. They are used as a way to summarize person and/or vehicle travel along a corridor that contains parallel facilities and are usually a subset of screenlines. For example, the Potomac River screenline is divided into a number of cutlines for each radial corridor that crosses the River.

HOT Lanes: Dedicated lanes that can be used by low occupant vehicles that pay a toll. High occupant vehicles typically can use the lanes for no charge. Dynamic pricing for low occupant vehicles is used throughout the day to regulate the volume of vehicles on the facility to maintain free-flow operating conditions.

Screenlines: Imaginary lines that delineate major physical barriers or jurisdictional boundaries. They are used as a way to summarize person and/or vehicle travel along a across these types of barriers/boundaries. For example, the Potomac River is a screenline established to measure person and vehicle travel between Virginia and Maryland/District of Columbia.

System-Level Performance Criteria: A set of performance criteria that were used to quantify the effects of the various year and network alternatives. These criteria were targeted at measures of the entire transportation system as a whole, as opposed to individual facilities.

Transit-Supportive Area: An area capable of supporting at least hourly transit service during the day. These areas have at least 3 households per gross acre and/or 4 jobs per gross acre.

Vehicle Miles of Travel (VMT): A measure of the amount of vehicle travel on roadways. It is calculated by multiplying the number of vehicles by the number of miles of each trip.

Volume-to-Capacity (V/C) Ratio: One of several measures used to describe the level of congestion on a roadway segment. For example, if the traffic volume exceeds a roadway segment's capacity, the V/C ratio will be greater than 1.

Acronyms

Abbreviation	Definition
ATLUS	Alternative Transportation and Land Use Strategies Committee
BRT	Bus Rapid Transit
CLRP	Constrained Long Range Plan
CMAQ	Congestion Mitigation Air Quality
CTB	Commonwealth Transportation Board
D.C.	District of Columbia
FDOT	Florida Department of Transportation
GMU	George Mason University
HBO	Home-based Other Trip
HBS	Home-based Shopping Trip
HBW	Home-based Work Trip
HCM	Highway Capacity Manual
HOT	High Occupancy Toll
HOV	High Occupant Vehicle
ITS	Intelligent Transportation Systems
LOS	Level of Service
LOV	Low Occupant Vehicle
MPO	Metropolitan Planning Organization
LRT	Light Rail Transit
MWCOG	Metropolitan Washington Council of Governments
NHB	Non-home Based Trip
NVTA	Northern Virginia Transportation Authority
NVTC	Northern Virginia Transportation Commission
ROW	Right-of Way
SOV	Single Occupant Vehicle

TCC	Transportation Coordinating Council
TCQSM	Transit Capacity and Quality of Service Manual
TIP	Transportation Improvement Plan
TPB	Transportation Planning Board
USDOT	United States Department of Transportation
V/C	Ratio of Volume to Capacity
VDOT	Virginia Department of Transportation
VMT	Vehicle Miles of Travel
VRE	Virginia Railway Express
W&OD	Washington and Old Dominion
WMATA	Washington Metropolitan Area Transportation Authority

Acknowledgements

This study was performed for the Northern Virginia Transportation Authority (NVTA). The Virginia General Assembly created the Northern Virginia Transportation Authority on July 1, 2002 and charged it with development of a long-range transportation plan for the Northern Virginia region. NVTA recommends to the Commonwealth Transportation Board (CTB) which transportation projects should receive funding.

The Authority is comprised of 16 members; nine are mayors or chairs, or their designees, of the nice cities and counties that are members of the Authority; two are members of the House of Delegates; one is a State Senator; and two are citizens appointed by the Governor. In addition, the Director of Virginia's Department of Rail and Public Transportation and the Commonwealth Transportation Commissioner, or designee, serve as non-voting members.

Northern Virginia Transportation Authority Memberships:

David F. Snyder, NVTA Chairman; City of Falls Church
Christopher E. Zimmerman, NVTA Vice Chairman; Arlington County
William D. Euille, City of Alexandria
Robert F. Lederer, City of Fairfax
Gerald E. Connolly, Fairfax County
Harry J. "Hal" Parrish, II, City of Manassas
Bryan Polk, City of Manassas Park
Sean T. Connaughton, Prince William County
William C. Mims, Virginia Senate
Vincent F. Callahan, Jr., Virginia House of Delegates
Margaret E. G. Vanderhye, Governor's Appointee
(Vacant), Governor's Appointee, CTB Member
Karen Rae, Director, DRPT
Dennis Morrison, Administrator, Northern Virginia District Office, VDOT

The Northern Virginia Transportation Commission (NVTC) was chosen to administer the contract for the NVTA. A Subcommittee of the NVTA Interim Technical Committee was formed to monitor and guide the study process. This Subcommittee was comprised of staff representing Northern Virginia jurisdictions and regional transportation agencies operating in Northern Virginia.

The Project Managers for this study were Ricardo Canizales, with Prince William County Department of Public Works, and Jana Lynott, with the NVTC.

The consultant team was led by Christopher Gay, AICP of Vanasse Hangen Brustlin, Inc. (VHB). Subconsultants included Kittelson & Associates (transit and multimodal corridor level of service), Travesky & Associates, Inc. (public involvement), Burgess & Niple, Inc. (cost estimating) and Tricord, Inc. (ITS).