

**BOARD OF SUPERVISORS
BUSINESS MEETING
INFORMATION ITEM**

SUBJECT: Western Dulles Access Traffic Study

ELECTION DISTRICT: Dulles, Blue Ridge

STAFF CONTACTS: Joe Kroboth, Transportation and Capital Infrastructure
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Lou Mosurak, Transportation and Capital Infrastructure
Bob Brown, Transportation and Capital Infrastructure

PURPOSE: This item presents the findings and recommendations of the Western Dulles Access Traffic Study to the Board of Supervisors (Board). The study provides an independent evaluation of the Virginia Department of Transportation's (VDOT) Dulles Air Cargo, Passenger and Metro Access Highway Study.

BACKGROUND: In 2013 VDOT initiated an Environmental Assessment (EA) for the Dulles Air Cargo, Passenger and Metro Access Highway (DACPMAH), a new limited-access roadway providing direct access from the west to the Washington Dulles International Airport. The DACPMAH study was envisioned as a means to improve connectivity to the airport from trunk roads in the Western Dulles Area. Multiple access points to the envisaged cargo area were considered off of Loudoun County Parkway between US 50 and Ox Road. The study included an evaluation of the following five alternatives:

Alternative 1: No Build

The No Build Alternative included all planned and programed transportation improvements in the study area that have been approved and adopted for implementation by 2040, as identified in the 2012 National Capital Region's Financially Constrained Long-Range Plan (CLRP). The following is a list of the planned roadway improvements included in the CLRP:

- Construction of the Loudoun County Parkway (VA Route 606 / VA Route 607) to four lanes from Old Ox Road (VA Route 606) / Arcola Road (VA Route 842) to Ryan Road (VA Route 772);
- Widening of US Route 50 from four to six lanes from Gum Spring Road (VA Route 659) to Sully Road (VA Route 28);
- Completion of the new Bi-County Parkway (VA Route 411), a four-lane limited access facility from Prince William Parkway (VA Route 234) in Prince William County at



Interstate 66 in Fairfax County to US Route 50, west of Dulles Airport along the Northstar Boulevard alignment in Loudoun County;

- Widening of Gum Spring Road (VA Route 659) from two lanes to a four-lane divided facility from Braddock Road (VA Route 620) to US Route 50;
- Reconstruction and widening of Old Ox Road (VA Route 606) from two to four lanes from Moran Road (VA Route 634) to Evergreen Mills Road (VA Route 621);
- Construction of an interchange at US Route 50 and Old Ox Road (VA Route 606) / Loudoun County Parkway; and
- Construction of Tall Cedars Parkway (VA Route 2200) to a four-lane divided facility from Gum Spring Road (VA Route 659) to Pinebrook Road (VA Route 827).

Alternative 2

Alternative 2 is a new roadway originating at US Route 50, approximately 2.2 miles west of its existing intersection with the Loudoun County Parkway (Route 606 / VA Route 607), in the location where the Bi-County Parkway (VA Route 411) interchange is planned. Alternative 2 would connect to the proposed interchange allowing for all movements to and from US Route 50 and the proposed Bi-County Parkway (VA Route 411). From US Route 50, the Alternative 2 would follow a new alignment located within the same corridor as Loudoun County's proposed Northstar Boulevard, extending approximately one-mile northeast before turning due east approximately 0.25 mile south of Evergreen Mills Road (VA Route 621). The alignment would continue east for approximately 1.7 miles, with an overpass at Belmont Ridge Road (VA Route 659) and Evergreen Mills Road (VA Route 621) until intersecting with existing Old Ox Road (VA Route 606) / Loudoun County Parkway. This connection would consist



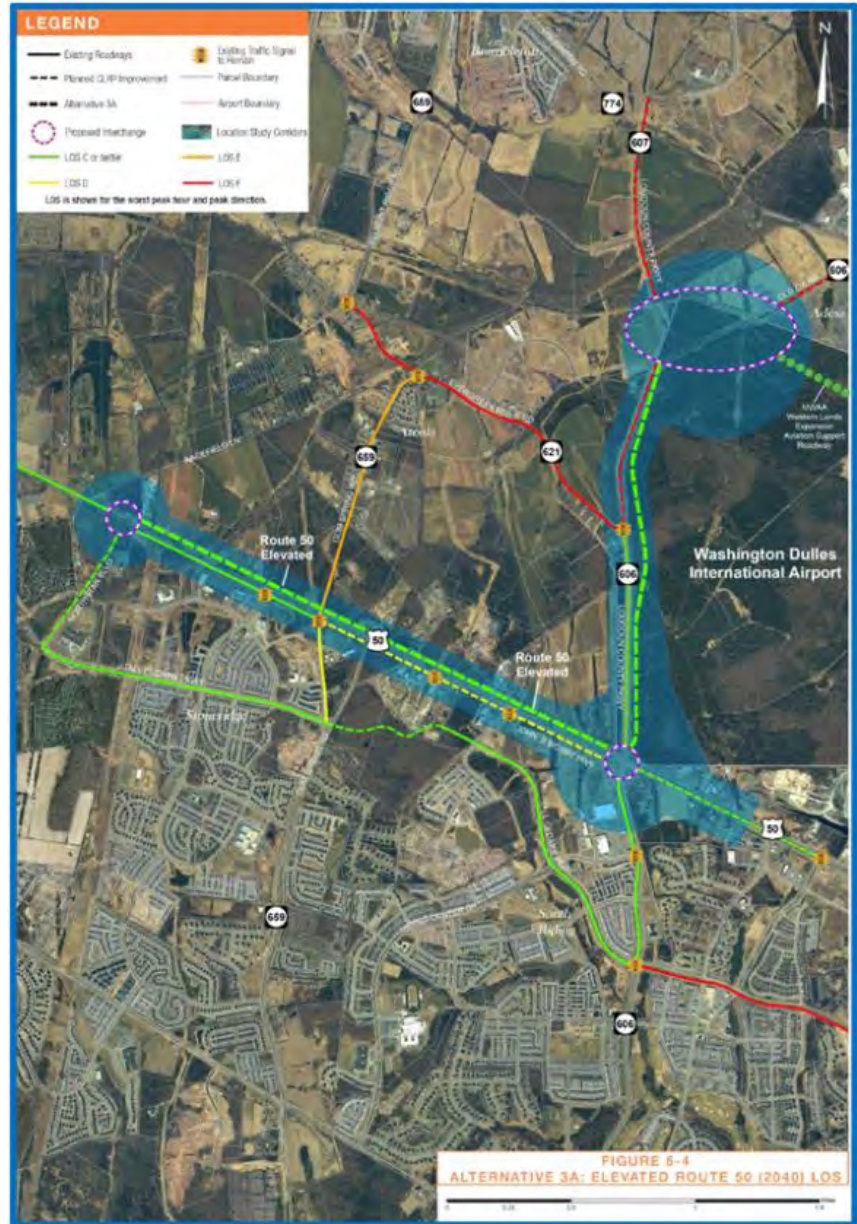
of a full-access interchange with Old Ox Road (VA Route 606), the planned Loudoun County Parkway (VA Route 607) extension, and future airport connector roads. Alternative 2 would be a limited access highway, with no direct access to adjoining properties. Instead, connections with

arterial roadways would be provided via US Route 50, Bi-County Parkway, Old Ox Road (VA Route 606), planned extension of Loudoun County Parkway (VA Route 606 / VA Route 607) and the future airport connector roads. Alternative 2 would consist of a four-lane divided principal arterial with a design speed of 60 miles per hour.

Alternative 3A

Alternative 3A would be a four-lane divided limited access principal arterial, on an aerial structure within the median of US Route 50. In order to construct the aerial structure, the existing US Route 50 median would need to be widened, resulting in the at-grade lanes for US Route 50 being shifted outward from the widened median. Upon returning to grade parallel to Loudoun County Parkway (VA Route 606/ VA Route 607), Alternative 3A would continue to be a four-lane divided, limited access principal arterial but at-grade instead of elevated.

Alternative 3A would originate at US Route 50 and the planned Bi-County Parkway interchange and provide full connections to Bi-County Parkway (VA Route 411). Proposed Alternative 3A would provide access to US Route 50 westbound and from US Route 50 eastbound only. From the interchange at Bi-County Parkway (VA Route 411), Alternative 3A would follow along the US Route 50 alignment in an elevated section, within the roadway median. At the future interchange with Loudoun County Parkway, the roadway would travel north over the Loudoun County Parkway and return to grade on the east side of Old Ox



Road (VA 606) / Loudoun County Parkway, on Dulles Airport property. Alternative 3A would provide a connection to US Route 50 eastbound and from US Route 50 westbound at this future interchange. From there the facility would extend parallel to Old Ox Road (VA Route 606) / Loudoun County Parkway approximately 1.7 miles to the future airport connector roads. Flyover ramps would be provided along this portion of Alternative 3A to provide a connection from northbound Alternative 3A to northbound Loudoun County Parkway and from southbound Loudoun County Parkway to southbound Alternative 3A. A proposed full-access interchange with Old Ox Road (VA Route 606), the planned Loudoun County Parkway (VA Route 607) extension, and future airport connector roads is proposed.

Alternative 3B

Alternative 3B would originate at the planned full-access interchange of US Route 50 and the Bi-County Parkway (VA Route 411). US Route 50 would be widened from four (4) lanes to six (6) lanes plus two (2) auxiliary lanes, from the planned interchange at Bi-County Parkway (VA Route 411) to Gum Spring Road (VA Route 659). At-grade access would be closed along US Route 50 from Bi-County Parkway to Loudoun County Parkway to meet the limited access requirements. Access to properties to the south would be provided from Tall Cedars Parkway. Access to properties to the north would be provided from a parallel frontage road accessed from Gum Spring Road (VA Route 659). The Loudoun County CTP identifies proposed Glascock Boulevard as a parallel facility to the north of US Route 50, but this facility is not currently included in the CLRP and therefore not included in this study. A full access interchange at Gum



Spring Road (VA Route 659) and US Route 50 County Parkway, with design speeds of 60 miles per hour.

Alternative 3C

Alternative 3C provides access to Dulles Airport by a southern entrance point at the planned interchange of US Route 50 and Loudoun County Parkway. Alternative 3C would originate at the planned full-access interchange of US Route 50 and the planned Northstar Boulevard (VA Route 411) / Bi-County Parkway and extend along US Route 50 to an interchange at Old Ox Road (VA Route 606) / Loudoun County Parkway / Dulles Airport property. At the eastern terminus, airport access would be provided into the southwest corner of Dulles Airport. The ramps between Alternative 3C and Dulles Airport would connect to the future perimeter road on MWAA property. According to MWAA, the future perimeter roads at Dulles Airport will ultimately allow traffic to reach planned expansion areas as well as the Main Terminal area. MWAA has confirmed that their ALP



would be updated to reflect this link to the public roadway network. Under Alternative 3C, access to and from the airport would be provided from both directions of US Route 50 and both directions of VA Route 606 / Loudoun County Parkway. Along US Route 50, Alternative 3C would consist of six through lanes (three in each direction), three interchanges along US Route 50 at Northstar

Boulevard (VA Route 411) / Bi-County Parkway, Gum Springs Road, and Old Ox Road (VA Route 606) / Loudoun County Parkway, two auxiliary lanes (one in each direction connecting the ramps of the interchanges), and two dedicated lanes, separated by a concrete median, for traffic in and out of Dulles Airport (one in each direction). VA Route 606 would be widened to six lanes between its interchange with US Route 50 and where the Dulles Loop widening is expected to terminate. A frontage road would be included on the north side of US Route 50 in order to maintain access for residents and businesses along this corridor.

In 2014 VDOT indicated Alternative 3C was the preferred alternative.

The Board held a public input session at Briar Woods High School on June 2, 2014 followed by a brief discussion at the June 4, 2014 Board Business meeting where Chairman York requested the Board add an item to the agenda for the June 18th meeting to discuss the Dulles Air Cargo, Passenger and Metro Access Highway project. The Board held a public input session at Briar Woods High School on June 2, 2014 regarding the proposed access road. The Board sponsored the June 2, 2014 Public Meeting to allow for the following:

1. Provide a summary of the Countywide Transportation Plan (CTP) as it relates to the Route 50 corridor and areas south of the Brambleton community;
2. Allow VDOT the opportunity to present the findings and conclusions of their EA; and
3. Provide an opportunity for the public to submit testimony on the information provided and alternatives contained within the various presentations.

A total of 49 speakers addressed the Board during the June 4th session and their input on the matter is summarized as follows:

- In favor of the No Build Alternative: 14
- In favor of Alternative 2A: 22
- In favor of Alternative 3C: 13

In addition to those addressing the Board, three speakers also provided recorded comments with two stating preference for Alternative 2 and one for Alternative 3C.

At the Board Business meeting held on June 4, 2014, Chairman York requested the board add an item to the agenda for the June 18th meeting to discuss the Dulles Air Cargo, Passenger and Metro Access Highway. He suggested staff be directed to perform computer modeling that included at least three scenarios, so as to provide the Board with more information before rendering a position on the various alternatives proposed.

At the June 18, 2014 Committee of the Whole meeting the Board directed staff to engage the services of a Consultant to model the Western Dulles Access and Metro Access Highway scenarios and report the findings back to the Board Supervisors when completed. Staff was directed (vote 9-0) to conduct a travel demand model analysis to study the Dulles West area to determine whether

the road network identified in the CTP is sufficient for projected travel demand in the Western Dulles area. The study area is generally bound by Dulles Greenway (Route 267) to the north, Braddock Road (Route 620) to the south, Route 15 to the west, and Dulles International Airport to the east. An expanded study area was reviewed to evaluate the effect of the model scenarios on the major corridors of the surrounding area. This extended study area includes the area north to Route 7, east to Route 28, and south to the Prince William County border. Members of the Board discussed the planning parameters and asked staff to incorporate the following:

- Chairman York asked staff to include in the study area the Fairfax County line to Route 15 and from Prince William to the Maryland line and the rest of the suburban area of the County.
- Supervisor Volpe requested staff to review what the current Comprehensive Plan called for in the areas where VDOT's proposed alternatives were located, including zoning, by-right uses and current valuation of lands that would be impacted.
- Supervisor Letourneau asked that staff take a more "holistic" look of the project and include development which had occurred since 2010. He asked staff if there had been a review of the Northern Collector Road specifically. He asked that staff provide the Board the analysis of Dulles North Parkway. He also asked for updated statistics and updated levels of service for the road network that was around the development. He pointed out that the County should not add one lane as an express limited access going towards the airport.
- Supervisor Clarke requested staff to provide the community correct and accurate information with respect to the future conversion of limited Route 50 access to also include timing of the roads.

In the Spring of 2014 House Bill 2 (HB2) – was signed into law requiring the Commonwealth Transportation Board (CTB) to develop and implement a quantifiable and transparent prioritization process for making funding decisions for capacity enhancing projects within the six-year improvement program. The HB2 implementation process required projects, including the DACPMAH EA, to be put aside until the procedures required for HB2 could be further refined, and implemented by VDOT. Those results will determine if the DACPMAH Project will be contained in the next Six-Year Improvement Plan (SYIP). The CTB will begin using the HB2 process to select projects in 2016.

The *Western Dulles Access Traffic Study* (WDAS) was completed in May 2015 and is provided as Attachment 1. Kimley-Horn representatives will be in attendance at the May 20, 2015 Board Business Meeting; a copy of their presentation is provided as Attachment 2.

Summary of Study: The WDAS provides the Board with an independent study of the CTP road network and its ability to provide adequate access to the western lands of the airport at an acceptable level of service. The study area for the WDAS is located in the Dulles South region of Loudoun County. It is generally bound by Dulles Greenway (Route 267) to the north, Braddock Road (Route 620) to the south, Route 15 to the west, and Dulles International Airport to the east. An expanded study area was reviewed to evaluate the effect of the model scenarios on the major

corridors of the surrounding area. This extended study area includes Route 7 on the north, east to Route 28, and south to the Prince William Parkway border.

Eleven scenarios were analyzed to answer the Board's questions regarding various access points to the west side of the Dulles International Airport and analyze alternatives to the currently planned CTP network. These scenarios were grouped by the base roadway network assumptions as described below. The first group has the currently planned CTP as their base network.

1. **Scenario 1 - CTP Network as Planned:** No modifications were made to the CTP network.
2. **Scenario 1A - MWAA Socioeconomic Data for Western Lands:** This scenario is the same roadway network as Scenario 1 but (only for this Scenario) incorporates for the Western Lands area a build-out plan such that the land uses in western lands includes approximately 6 million square feet of development (e.g. - air cargo, air support, general aviation, non-residential mixed use—biomedical, data center, general office, hotel conference center, retail. This was done to show the most conservative (highest) assumption of development on the Western Lands property.

The second group of scenarios also incorporates the planned CTP network, with a revision of Northstar Boulevard. South of Braddock Road, these scenarios model Northstar Boulevard as a controlled access facility as it connects south into Prince William County. Many of the scenarios in this group incorporate alternative locations of airport access along Route 606 and US 50.

1. **Scenario 2 - Northstar Boulevard as Controlled Access Facility (Bi-County Parkway)** – This is the base network of the group two scenarios.
2. **Scenario 2A - Airport Access at Route 606/Loudoun County Parkway Interchange** – This scenario incorporates access to the airport directly from the Route 606 and Loudoun County Parkway interchange.
3. **Scenario 2B - Airport Access at Route 606/US 50 Interchange** – This scenario incorporates access to the airport directly from the Route 606 and US 50 interchange.
4. **Scenario 2C - Airport Access at Route 606/Loudoun County Parkway Interchange and Route 606/US 50 Interchange** – This scenario models airport access at both the Route 606 and Loudoun County Parkway interchange and Route 606 and US 50 interchange.
5. **Scenario 2D - Airport Access along Route 606 between US 50 and Dulles Greenway** – This scenario models airport access from Route 606 at a location between the interchanges planned at Loudoun County Parkway and at the CTP planned connection of Westwind Drive.
6. **Scenario 2E - Airport Access along US 50 between Route 606 and Tall Cedars Parkway** – Exploring other alternatives than access from Route 606, this scenario evaluates airport access along US 50, intersecting South Riding Boulevard.
7. **Scenario 2F - Connect Evergreen Mills Road with Northstar Boulevard and extend east to Airport Property** – The current CTP plans to close Evergreen Mills Road between Shreveport Drive and Belmont Ridge Road. This scenario explores maintaining connection

between Northstar Boulevard and Belmont Ridge Road as well as extending east beyond Route 606 to provide airport property access.

8. **Scenario 2G - New Facility from Glascock Boulevard to Arcola Boulevard, with Airport Access at Route 606/Loudoun County Parkway Interchange (VDOT Alternative 2)** – This scenario is aimed to incorporate the proposed new alignment of Alternative 2 from the VDOT study into the planned CTP network. This alignment would follow Northstar Boulevard approximately 1 mile north of US 50, where it would then turn east for approximately 1.7 miles to intersect with Route 606. This alignment would include overpasses above Belmont Ridge Road and Evergreen Mills Road. Airport access would then be provided at the interchange at Route 606 and Loudoun County Parkway.
9. **Scenario 2H - Airport Access at Route 606/US 50 Interchange; VDOT Alternative 3C modified to fit into the CTP network** – This scenario addresses a modified version of Alternative 3C from the VDOT study. In the VDOT study, two median-separated, dedicated lanes were modeled along US 50, reserved for airport traffic. Airport access was then assumed from the planned interchange at US 50 and Route 606/Loudoun County Parkway. This was modified to assume the CTP planned cross section of US 50, or a six-lane, divided limited access roadway.

The ultimate configuration of the CTP network, analyzed in Scenarios 1 and 1A shows that the planned network can handle the projected development in the Western Land area. Even at the heaviest saturation in the PM peak hour, there are few links that exceed capacity. The locations that experience heavier congestion include:

- Route 606 from Loudoun County Parkway to Dulles Greenway
- Loudoun County Parkway from Ryan Road to Shellhorn Road
- US 50 west of Lenah Farm Lane to Gilberts Corner

Route 606 and Loudoun County Parkway will provide major routes to future development at the airport, the planned Metrorail Stations (Route 606 and Route 772), and the anticipated development surrounding the new Metrorail Stations. It can be expected that in the PM peak hours of travel, these routes will experience some congestion. However, there are other facilities surrounding the Metrorail Stations that offer alternate routes through the planned transit and development centers that are not projected to exceed capacity. Additional bus transit options could alleviate some of the congestion displayed in the analysis. US 50, to the west side of the study area, results in heavier congestion due to the smaller cross section and reduced capacity as it enters the more rural portions of the County.

Though the impact is minimal, there are some effects noticed by the scenario changes.

- Location of airport access along Route 606 does not impact the network at a link-level analysis. Should the County proceed with exploring access along Route 606, a more micro-level analysis would be advised. ,,
- Airport access along US 50 relieves some congestion on Loudoun County Parkway and Route 606.

- Adding the Evergreen Mills Road connection relieves Tall Cedars Parkway, Braddock Road, and US 50, but these facilities perform adequately without the connection in place.

The analysis concludes that the CTP road network is adequate for growth within the Western Lands based on current land use plans in place today. There is no need to expand currently planned CTP network of for new roads to be expressed to serve the Dulles International Airport growth as planned today. All scenarios tested show that the CTP as planned serves the growth planned for this area of the County.

To goal of the study was to provide adequate and appropriate transportation access to Dulles International Airport and for the Western Lands in a manner consistent with the principles embodied in the Loudoun County Comprehensive Plan and Countywide Transportation Plan. This goal has been achieved through thorough analysis of the area using the adopted Loudoun County transportation model. The model proved to be an effective tool for this analysis.

ISSUES: As part of the study it was important to look at the Loudoun County Travel Demand (LCTD) base year model to determine how it performed in the study area. A comparison was performed of 2010 VDOT AADT volumes with the 2010 County model volumes. Based on this data, the model produced comparable volumes compared to the VDOT results, with a few locations loading slightly high throughout the study area. Based on the validation performed for the model as a whole, it was determined that additional calibration or validation of the model was not necessary. However, there are still differences between the model used for this study and the model used in the VDOT study, which was entirely based on the latest MWCOG model available at the time of their study. The following are ways in which the LCTM differs from, the MWCOG model:

- The MWCOG model only incorporates CLRP approved connections as of 2013¹. At the time of the study the latest approved CLRP did not include a number of CTP roadways that the County has subsequently included funding for in the CIP.
- Within Loudoun County, the MWCOG model has 282 zones that were subdivided to create 667 zones in LCTM.

Roadway link traffic volumes were forecast using the County model and used to calculate V/C ratios given the link capacity in the analysis year. Although a link level analysis of V/C ratios provides an idea of capacity and congestion of key roadways, it was also necessary to look at the network as a whole. While the model generally does a good job at forecasting travel demand at a system-level, it is not as reliable on a link-by-link basis. For this reason, travel sheds were evaluated by comparing the total capacity provided by parallel north-south and east-west connections. A V/C ratio of greater than one is generally used as performance criterion, but this does not necessarily imply a need for roadway capacity enhancements. Roadway capacity enhancements based on peak hour V/C ratio involve major capital investments for the one or two

¹ In October of 2014 MWCOG approved the 2014 CLRP which incorporates all of the CTP roadways in the study area.

worst hours of the day. Additionally, roadway congestion on a link over capacity could lead travelers to look for alternative driving patterns or alternate modes of transportation. For this reason, a more conservative V/C ratio threshold of 1.2 was used to color links red on the map. The analysis included V/C ratios for the AM and PM peak hours and daily conditions as well as a comparison of volumes along the major roadway connections in the network.

The County met with VDOT and MWAA at the beginning of the effort as key stakeholders in the project. At the meeting with VDOT, the County learned that the Bi-County Parkway is on hold and waiting for a pending statewide transportation project prioritization process being defined by the Virginia legislature under House Bill 2 (HB2). VDOT staff communicated that there are no current or near future plans to conduct any additional environmental study on any future highway in this area. MWAA has developed a Policy Guideline for the acceptance of unsolicited proposals in the Western Lands. Currently MWAA is developing a General Plan for the Western Lands in 2016. A handout developed by MWAA for this purpose is Attachment 3.

Staff has identified no outstanding issues with this report. The analysis concludes that the Countywide Transportation Plan (CTP) road network is adequate for any growth within Dulles International Airport based on current land use plans in place today. There is no need to expand the existing or planned CTP network of new roads to serve the Dulles International Airport growth. All scenarios tested show that the CTP as planned serves the growth planned for this area of the County.

FISCAL IMPACT: There is no immediate fiscal impact to the County as a result of this report. Future costs associated with funding planned improvements to build out the current CTP network will be identified at a later date as specific projects are considered for inclusion in the Capital Improvement Program (CIP).

WESTERN DULLES ACCESS STUDY

Prepared for:



Prepared by:

Kimley»Horn

April 2015

ATTACHMENT 1

A-1



Executive Summary

The purpose of this study was to prepare an independent evaluation of alternatives for a Western Dulles Access Road for the Loudoun County Department of Transportation and Capital Infrastructure (DTCI) and Board of Supervisors. The need and alternatives for this road were studied by the Virginia Department of Transportation (VDOT) in the Dulles Air Cargo, Passenger and Metro Access Highway (DACPMH) Environmental Assessment (EA) dated April 2014.

The analysis concludes that the Countywide Transportation Plan (CTP) road network is adequate for any growth within Washington Dulles International Airport based on current land use plans in place today. There is no need to expand the existing or planned CTP network of new roads to serve the Dulles International Airport growth. All scenarios tested show that the CTP as planned serves the growth planned for this area of the County.

To goal of the study was to provide adequate and appropriate transportation access to Dulles International Airport and for the West Dulles area in a manner consistent with the principles embodied in the Loudoun County Comprehensive Plan and Countywide Transportation Plan.

This goal has been achieved through thorough analysis of the area using the adopted Loudoun County transportation model. The model proved to be an effective tool for this analysis.

Findings from this analysis include:

- Location of airport access along Route 606 does not impact the network at a link-level analysis. Should the County proceed with exploring airport access along Route 606, a more micro-level analysis would be advised.
- Airport access along US 50 improves conditions on Loudoun County Parkway and Route 606.
- Adding the Evergreen Mills Road connection to Northstar Boulevard improves conditions on Tall Cedars Parkway, Braddock Road, and US 50, but these facilities perform adequately without the connection, as well.



Introduction

The purpose of this study is to prepare an independent evaluation of alternatives for a Western Dulles Access Road for the Loudoun County DTCL and Board of Supervisors. The need for, and alternatives for this road were studied by VDOT in the DACPMH EA dated April 2014, attached as **Appendix A**.

The need for the road is predicated both on growth projections at the airport and forecasted development in the surrounding area from existing land use, the County's Comprehensive Plan and approved zoning. In January 2010, a Cargo Area Study was published by the Metropolitan Washington Airports Authority (MWAA), which identified alternatives for the expansion of air cargo facilities at the airport. One alternative relocated cargo operations to the western side of the airport to allow expansion of passenger operations in the main terminal area on the north side. If the cargo area development proceeds according to the study, both cargo and employee traffic into and out of the airport will increase. The DACPMH was envisioned to improve connectivity to the airport from trunk roads in the Western Dulles Area (shown in **Figure 1**). Multiple access points to the envisioned cargo area were considered off of Loudoun County Parkway between US 50 and Old Ox Road.

Another impetus is the need for airport connectivity from a north-south corridor, studied by VDOT in late 2012 (http://www.vtrans.org/northern_virginia_north-south_corridor.asp). This study originated when the Commonwealth Transportation Board established a new Corridor of Statewide Significance in Northern Virginia. This planned route will connect eastern Loudoun including the Dulles West area, with I-66 and I-95. The corridor operates as Route 234 between I-95 and I-66, will continue as the Bi-County Parkway between I-66 and US 50, and will travel through Loudoun County to Dulles Greenway and Route 7 along Northstar Boulevard and Belmont Ridge Road. It does not include specific connections to the airport, but introduction of this new corridor and intra-county connection resulted in exploration of a Western Dulles cargo road.

Loudoun County staff was directed to conduct a travel demand model analysis to study the Dulles West area to determine whether the road network identified in the CTP is sufficient for projected travel demand in the Western Dulles area, both inside and outside of the Airport property. A Western Dulles Access Road was not included in the CTP. This analysis was conducted using the Loudoun County Travel Demand Model (LCTDM), developed and refined in 2014.

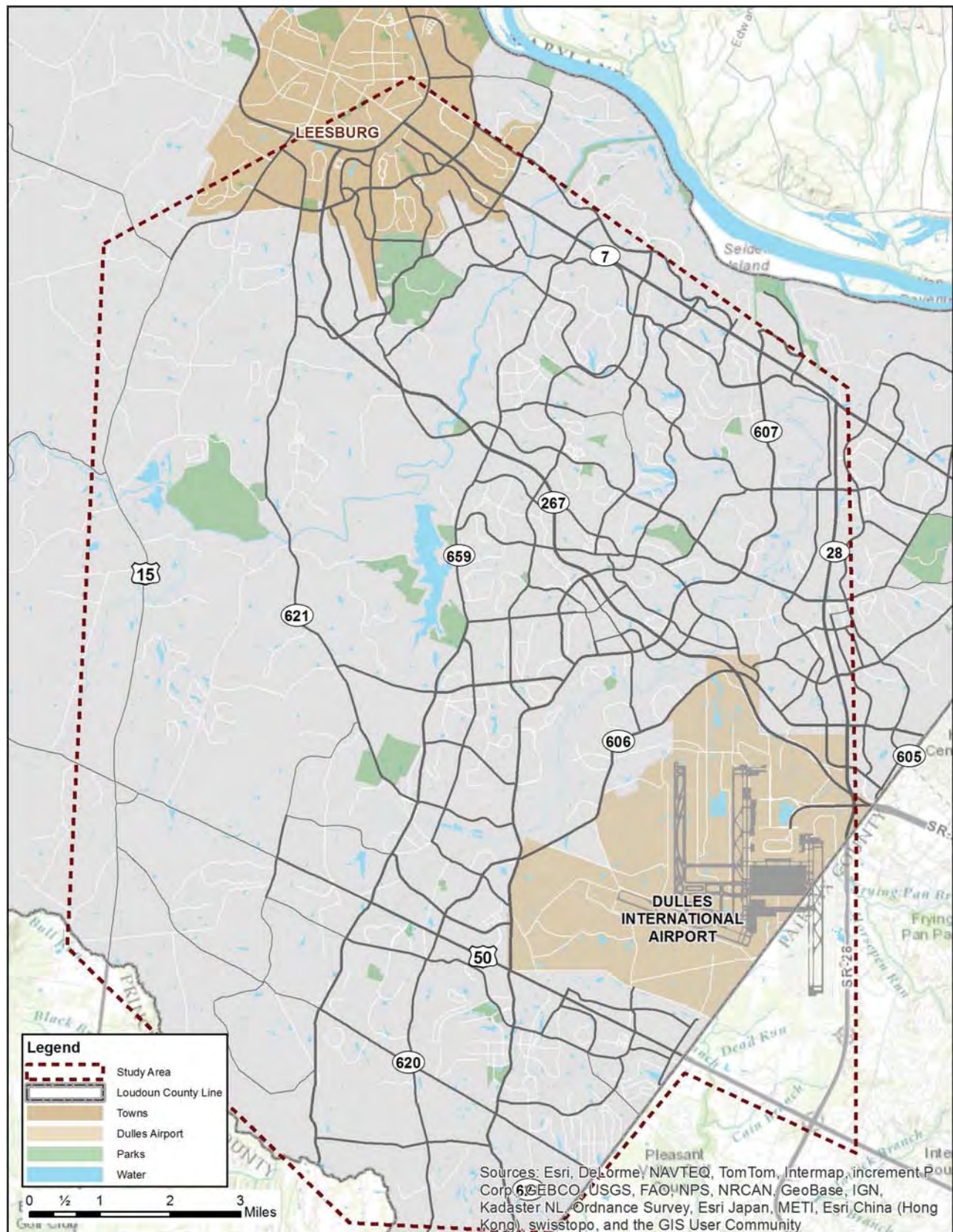
The focus of this study is the Dulles West Area, but it is done in the context of the Loudoun County Comprehensive Plan and Countywide Transportation Plan. Loudoun County continues to experience growth in the Dulles West area attributed to residential, institutional, and commercial development. The transportation system in the area is evolving as development occurs, but in some cases, not quickly enough to address major connectivity and mobility issues.

STUDY AREA

The study area for the Western Dulles Access Study is located in the Dulles South region of Loudoun County. It is generally bound by Dulles Greenway (Route 267) to the north, Braddock Road (Route 620) to the south, Route 15 to the west, and Dulles International Airport to the east. An expanded study area was reviewed to evaluate the effect of the model scenarios on the major corridors of the surrounding area. This extended study area includes the area north to Route 7, east to Route 28, and south to the Prince William County border.



Figure 1: Expanded Study Area





COORDINATION

The County met with VDOT and MWAA at the beginning of the effort as key stakeholders in the project. At the meeting with VDOT, the County learned that the Bi-County Parkway is on hold and waiting for a pending statewide transportation project prioritization process being defined by the Virginia legislature under House Bill 2 (HB2). VDOT staff communicated that there are no current or near future plans to conduct any additional environmental study on any future highway in this area.

MWAA staff shared that they have no existing plans to immediately develop the west side of the airport (the “western lands”). MWAA had no large developer that planned to locate in these areas as of the date of the coordination meeting. As a result, the County record of land use for the western lands was used as a base for land use for the analysis in this project.

GOALS AND OBJECTIVES

The following goals and objectives were developed with guidance from the DTCL staff. They guided the study methodology and provided a basis for measuring the effectiveness of different transportation concepts explored in this study.

Goal

Provide adequate and appropriate transportation access to Washington Dulles International Airport and for the West Dulles area in a manner consistent with the principles embodied in the Loudoun County Comprehensive Plan and Countywide Transportation Plan.

METHODOLOGY

Eleven possible improvement scenarios were identified for evaluation in consultation with County staff. These scenarios explored potential solutions including different connections to the airport and the extension of Evergreen Mills Road to Northstar Boulevard.

These 11 scenarios, described in greater detail later in this report, were evaluated using the Loudoun County Travel Demand Model (TDM) to determine the transportation solutions that would best serve the County’s needs.



Existing Conditions

The purpose for documenting existing conditions was to establish an analytic basis for future analyses. Evaluating and studying existing conditions was also an avenue for verifying study assumptions and gaining a better understanding for current travel behavior. The following sections summarize existing vehicular conditions in the study area.

EXISTING ROADWAY CONDITIONS

Several major roadways are located in the study area and are described as follows:

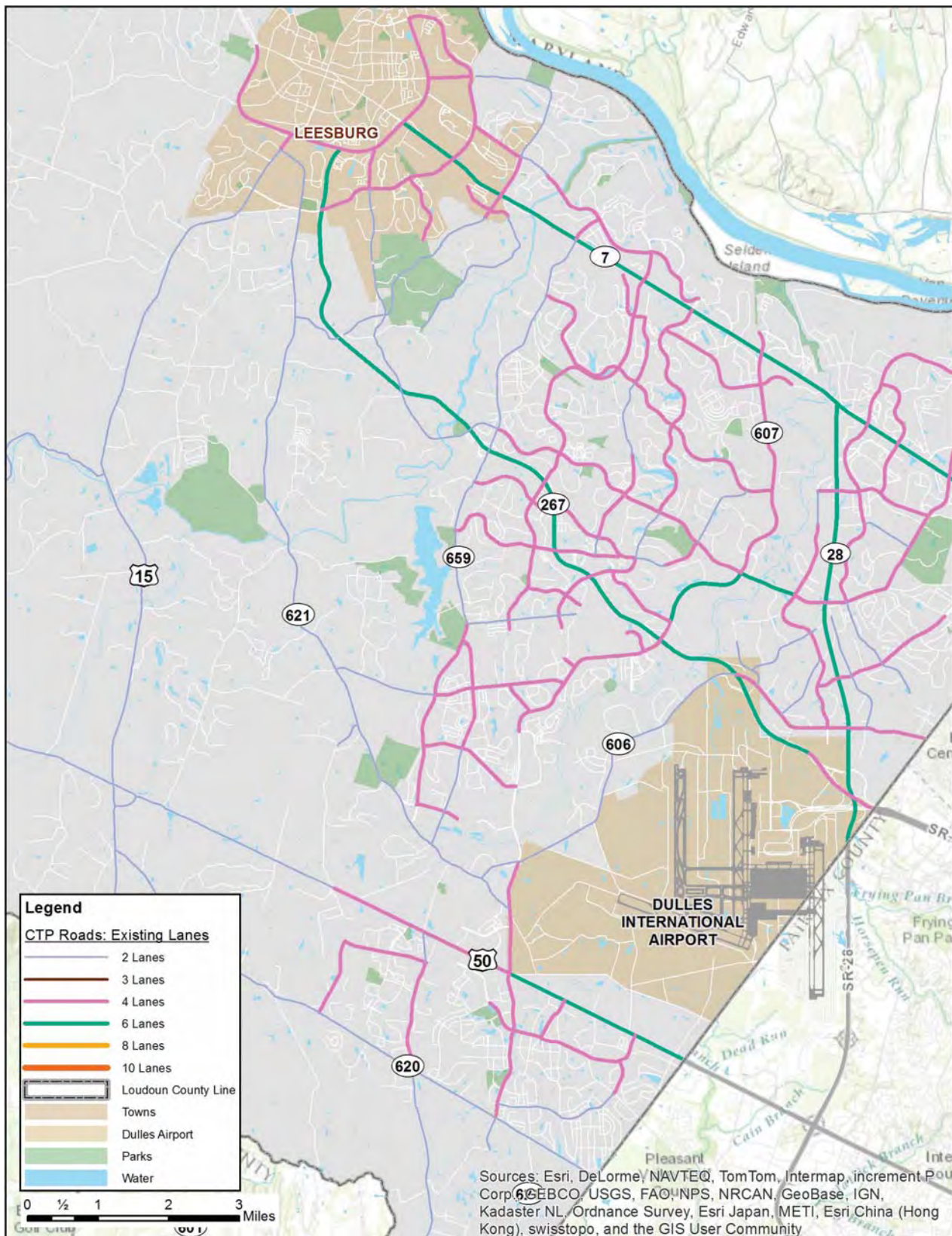
- **James Monroe Highway (US Route 15)** is a two-lane undivided minor arterial within the entirety of the study area. It runs north-south, providing access from the Town of Leesburg south to the County's boundary. It also provides inter-county connections to Prince William County to the south and Maryland to the north.
- **John Mosby Highway (US Route 50)** is a two-lane undivided minor arterial west of Fleetwood Road, a four-lane divided principal arterial from Fleetwood Road and Stone Springs Boulevard, a five-lane divided principal arterial from Stone Springs Boulevard to Loudoun County Parkway, and a six-lane divided principal arterial east of Loudoun County Parkway. US Route 50 serves as an east-west connection for residences and businesses in the Dulles South area. It also provides access east into Fairfax County and west to Middleburg.
- **Loudoun County Parkway (VA Route 606/VA Route 607)** is a four-lane divided urban collector road from Braddock Road to US Route 50 and four-lane divided urban collector from US 50 to Arcola Road and from Evergreen Ridge Drive to the Dulles Greenway. Loudoun County Parkway runs north-south, providing access to local residences and businesses.
- **Old Ox Road (VA Route 606)** is a two-lane undivided urban collector, starting at the intersection of Arcola Road and Loudoun County Parkway and continuing northeast.

- **Belmont Ridge Road (VA Route 659 Road)** is a two-lane undivided urban collector from Evergreen Mills to Shreveport Drive and a four-lane divided urban collector north of Shreveport Drive. This north-south route serves residential land uses.
- **Evergreen Mills Road (VA Route 621)** is a two-lane undivided rural collector west of Belmont Ridge Road and two-lane undivided urban collector east of Belmont Ridge Road. This road serves residential properties from Leesburg to Loudoun County Parkway near Arcola.
- **Tall Cedars Parkway** is a four-lane divided urban collector that runs east-west parallel to US Route 50. This road serves local commercial and residential properties south of US Route 50.
- **Northstar Boulevard** is a four-lane divided urban collector, running north-south from Shreveport Drive to Belmont Ridge Road. A two-lane undivided section is also in place between Braddock Road and Tall Cedars Parkway.

A full map of the study area roadways and existing laneage is provided in **Figure 2**.



Figure 2: CTP Network - Existing Conditions





Assessment of Existing Network

VOLUMES

Existing average daily traffic volumes were collected from annual average daily traffic (AADT) reports published by VDOT for 2013.

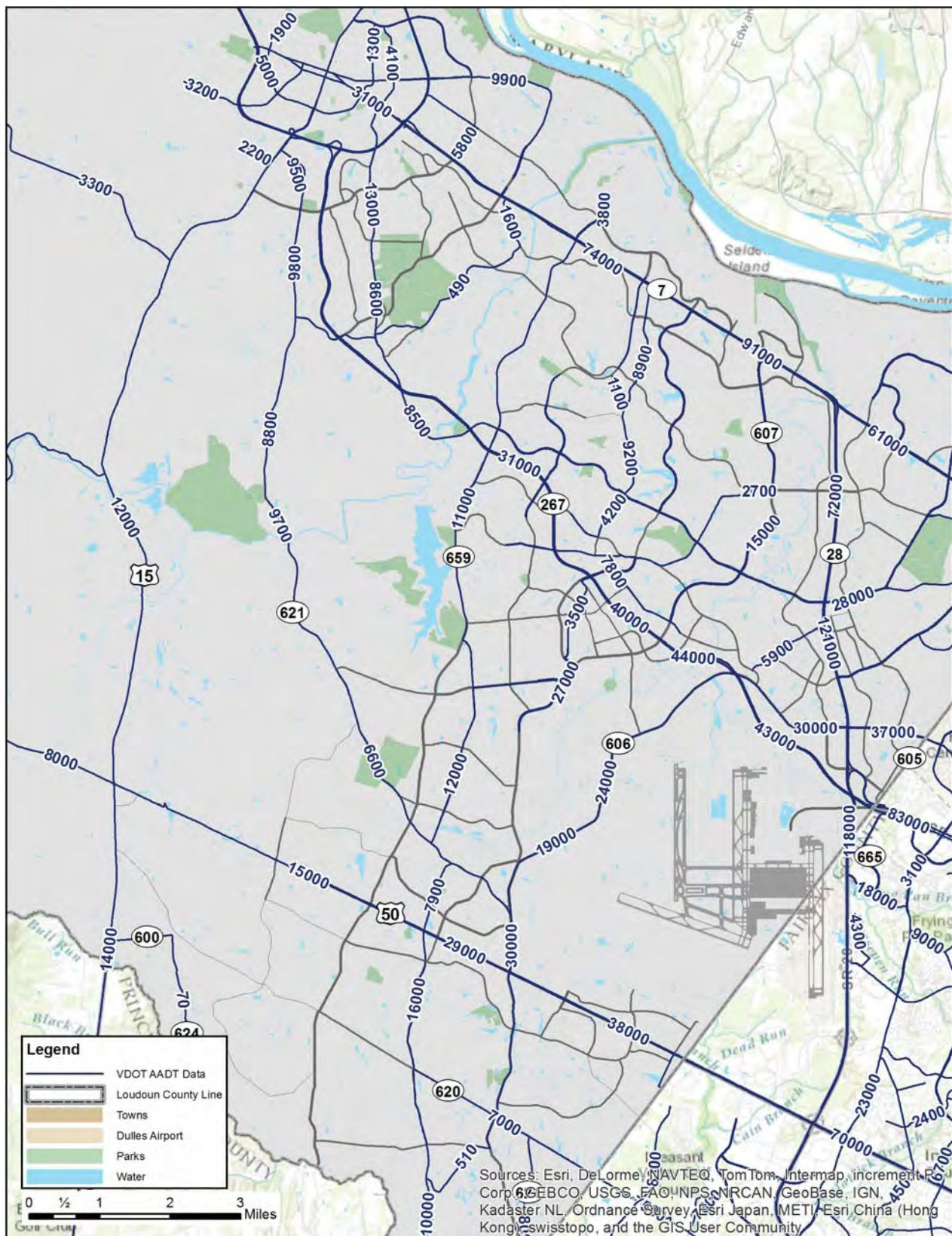
Figure 3 shows the available existing daily traffic volumes for study area roadways.

Existing daily traffic volumes show that the majority of the east-west volumes are served by US 50 (John Mosby Highway). This is the largest east-west facility in the Western Dulles area. Drivers traveling in the east-west direction from western Loudoun County into Fairfax County have the option of using this facility or the parallel routes on Dulles Greenway to the north and I-66 to the south.

Within the study area, Route 606 (Old Ox Road) carries the greatest north-south volumes. This is to be expected, as it is the only complete direct north-south connection in the West Dulles area. To the west, US 15 carries north-south traffic between Leesburg and southern Loudoun County, and on the east side of the airport property, Route 28 (Sully Road) serves as a heavily traveled north-south connection.



Figure 3: 2013 VDOT AADT Data





DEFICIENCIES

Based on the volumes carried along existing roadway networks, and knowledge of congestion along the Loudoun County roadways, there are multiple locations within the study area network that are approaching or exceeding the available roadway capacity. These deficiencies exist both in the north-south and east-west directions of travel. The lack of north-south connections is evident by the current congestion experienced along Old Ox Road and Belmont Ridge Road, especially during the PM peak hours. Loudoun County Parkway and US 15 also experience delay during the commuter peak hours. Various sections of US 50 and the Greenway experience capacity constraints, as they are the two main east-west connections in the study area.

OPPORTUNITIES

The County has the benefit of several opportunities to meet the travel demand in this area. Chief among them is the CTP, which includes Northstar Boulevard, the completion of Loudoun County Parkway, and the upgrade of several other key facilities including Belmont Ridge Road (Route 659). These connections have already been approved and the right-of-way to construct them is obtainable. The CTP network provides greatly enhanced connectivity from all trunk roads serving the area including Route 7, the Dulles Greenway, Route 15, and US 50.

CONSTRAINTS

Many constraints exist to future transportation development. The major obstacles are environmental barriers and approved land developments.

Water bodies are abundant in the West Dulles area. Broad Run, in particular, is a long body of water running north-south along the eastern portion of the County from Braddock Road, north to the Potomac River. This waterway presents a large obstacle to transportation development, as all crossings require expensive structures and environmental standards to meet. This contributes to the cause of scarce east-west connections in this portion of the County. Between Route 7 and US Route 50, there are 3 crossings of Broad Run, at Waxpool Road, Dulles Greenway, and Evergreen Mills Road. An additional crossing is currently planned and funded for the extension of Gloucester Parkway from Loudoun County Parkway to Pacific Boulevard.

Properties that received approval for development since the adoption of the initial CTP in the 1990s are required to provide right-of-way for these County planned roadway connections; however, once the developments are approved it is difficult to implement additional roadway connection beyond those outlined in the CTP. Many residential, commercial, and business land uses are approved along the west side of the Route 606 Corridor, creating obstacles for new alignments to the west side of the airport property.



Land Use Assumptions

PLANNED WEST DULLES AREA LAND USE

The West Dulles area surrounding the airport property is planned for a significant amount of development in the future. This development is varied by mixed residential, commercial, industrial, business, and many other land uses. The planned land use of this area is shown in **Figure 4**. The County's Planning and Zoning Department is well acquainted with the approved sites and their anticipated build out years. This knowledge enabled the County to develop more detailed land use assumptions for use in the socioeconomic data embedded in each traffic analysis zone (TAZ) of the County model. The household, population, and employment data across the County vary from the assumptions held within the Metropolitan Washington Council of Governments (MWCOC) model, which was used as the basis of the VDOT study.

MWAA PROPERTY LAND USE

Aside from general land use assumptions rooted in the County model and the VDOT study model, there are specific differences in the anticipated development of MWAA airport property. The VDOT study model incorporated MWCOC model assumptions and the MWAA Western Lands Mixed-Use and Cargo expansion including 6 million square feet of office, retail, and industrial land uses in TAZ 2387. This expansion incorporated two access points and a proposed collector road to connect to the eastern part of the airport. Since the development of these land use assumptions, County staff met with MWAA to discover how these assumptions have evolved. This meeting resulted in less rigorous development plans and no plans for the internal collector road. As a result, different employment data was calculated and embedded in the County model. The differences in employment data by TAZ are summarized in **Table 1**. These TAZs are mapped in **Figure 5**, with the western lands TAZs highlighted in blue.

Table 1 Employment Data by TAZ

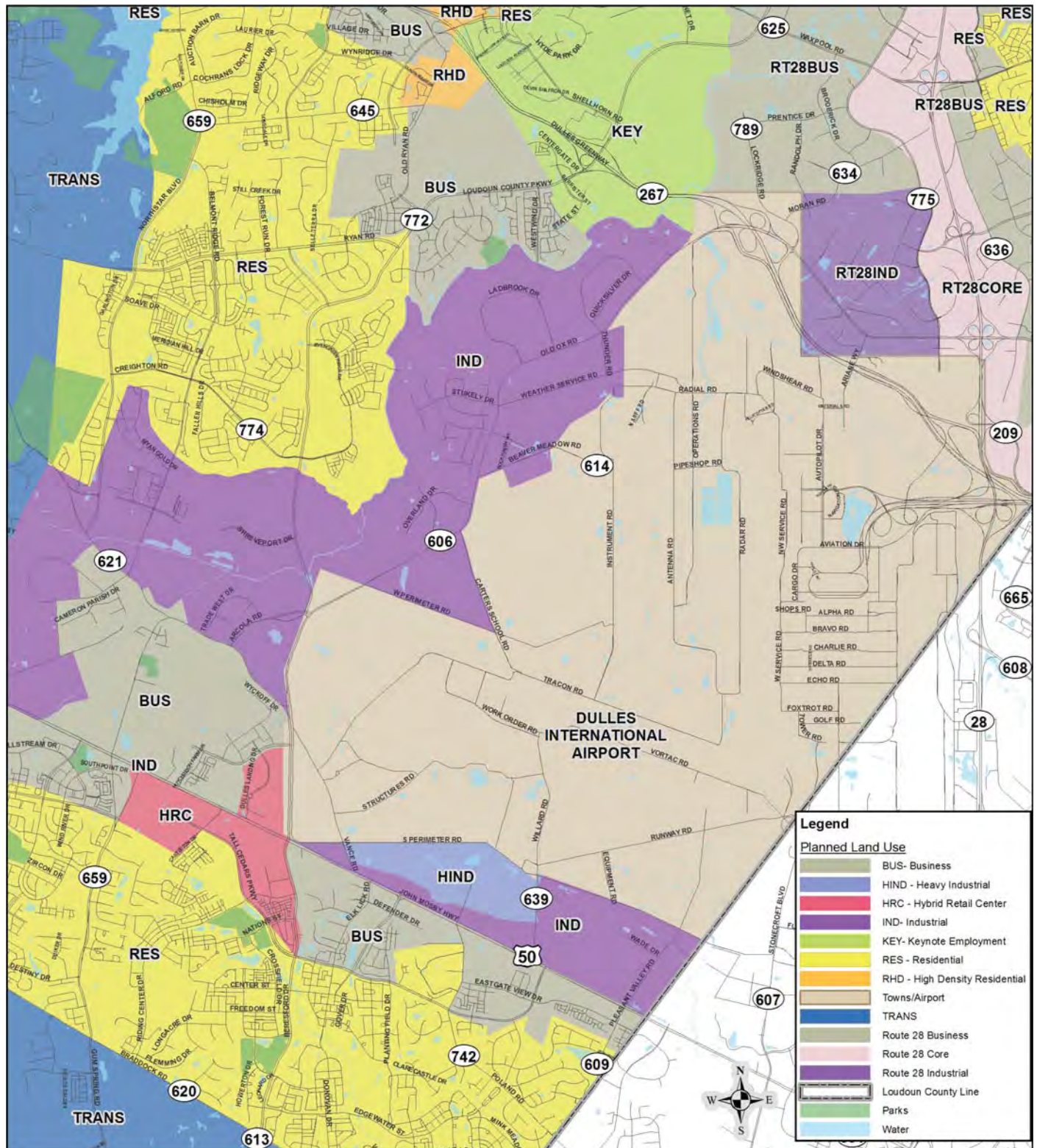
MWAA Property TAZs			
VDOT Study SE Data ¹		Loudoun Model SE Data ²	
TAZ	2040 Employment	TAZ	2040 Employment
2387	10,164	515	1,621
		516	1,747
		517	1,373
Total	10,164	Total	4,741
2388	21,934	518	19,854
		519	4,190
Total	21,934	Total	24,044
TAZs Total	32,098	TAZs Total	28,785

¹ TPB Travel Forecasting Model, Version 2.3.39 with COG Round 8.1 Cooperative Forecasts - model used in VDOT Transportation and Traffic Technical Report for Dulles Air Cargo, Passenger and Metro Access Highway (2014); also includes potential six million square feet of MWAA Western Lands Mixed-Use and Cargo expansion

² Loudoun County Travel Demand Model, developed in 2014



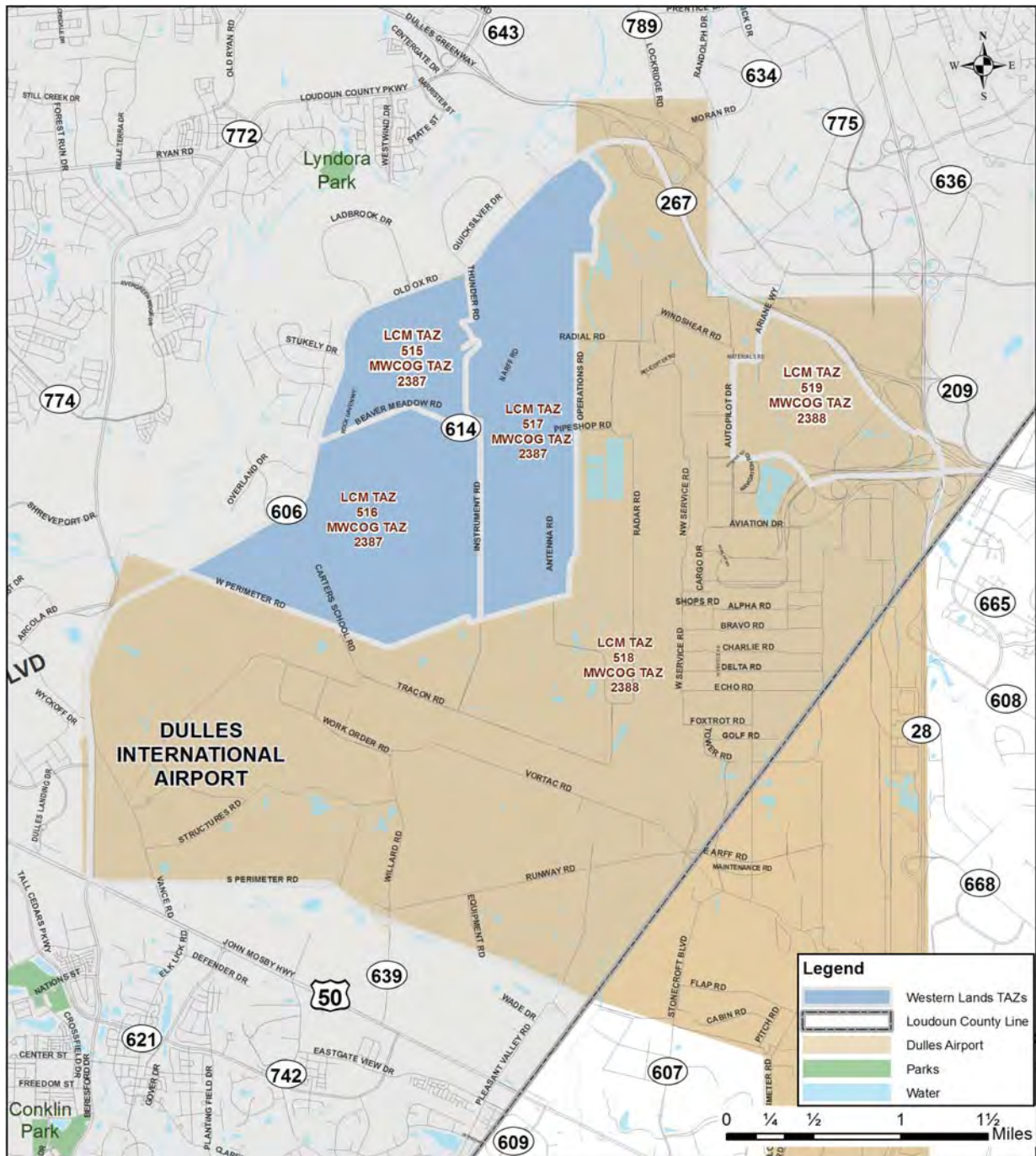
Figure 4: Planned Land Use



Source: Loudoun County Office of Mapping and Geographic Information, and Department of Planning and Zoning



Figure 5: MWA Property TAZs



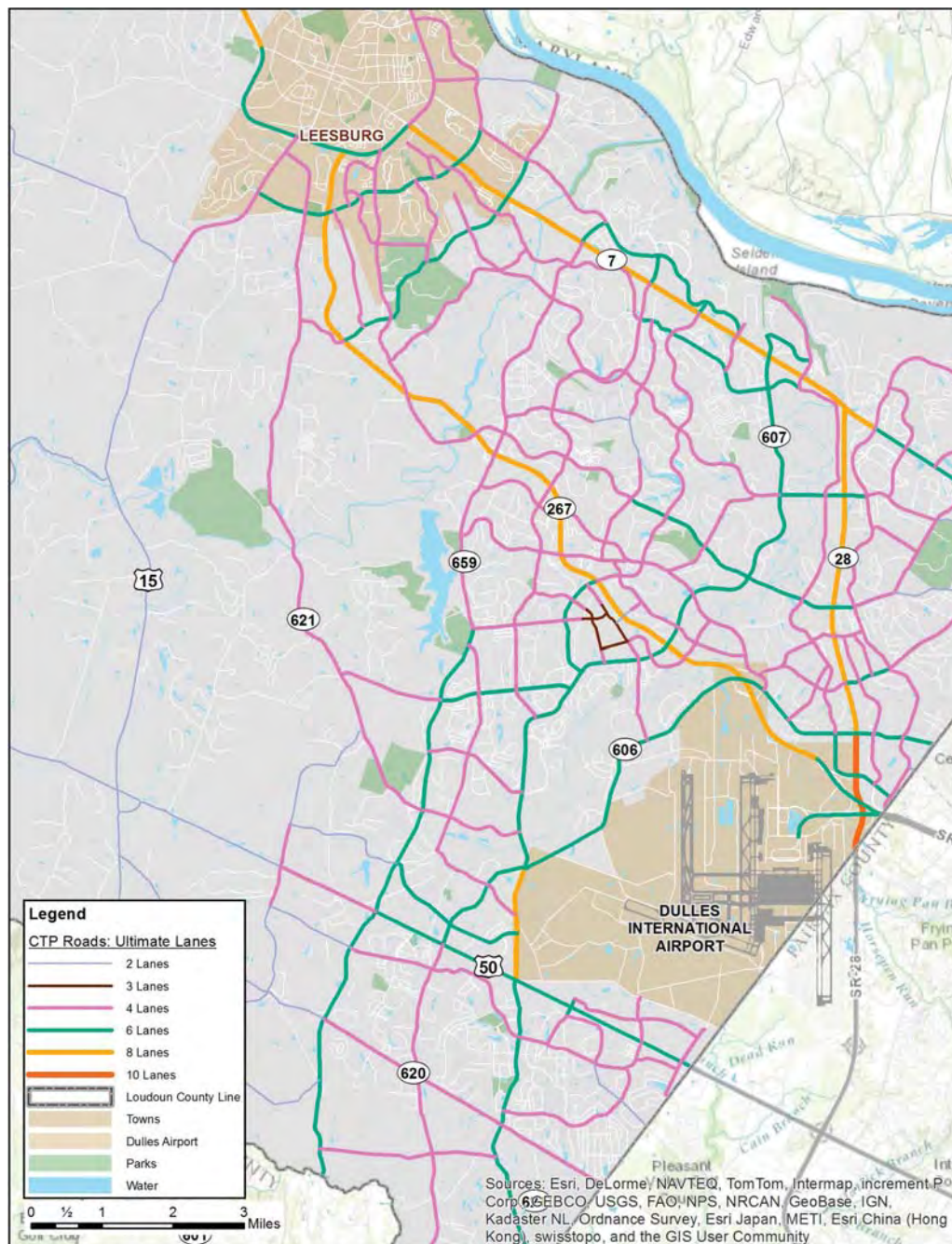


Future Conditions

FUTURE CTP NETWORK

The Loudoun County CTP was adopted in 2010, and updated through June 11, 2014, as a planning document for the anticipated roadway network needed to accommodate future development and travel demand. This roadway network was used as the baseline condition for the 2040 scenarios evaluated by this study. The planned roadway connections and number of lanes are shown on Figure 6.

Figure 6: Ultimate CTP Network





Loudoun County Model

The Loudoun County TDM can best be viewed as a hybrid county model. When one thinks of a county model, one generally imagines something that provides information for just the county being modeled. In this case; however, the Loudoun County model is actually part of the MWCOG TDM, a much larger regional model covering more than 15 partial or total jurisdictions in Virginia, Maryland, and the District of Columbia. See **Figure 7** for a visual of the model's coverage.

Figure 7: COG Model Coverage



The LCTM Model Development and Validation Report describes the model's structure as:

“Based mainly on similar models recently developed for Prince William, Stafford, and Spotsylvania Counties in Virginia. These are suburban area models each of which focuses on a particular county but which all include the larger region. In addition, parts of the new (2014) model were adapted from the MWCOG model. The new model covers the entire Washington metropolitan area (same area as MWCOG) and largely represents the state of the art in four-step aggregate modeling. However, it is less complex than the MWCOG model, with fewer input requirements, much shorter run time, and a considerably simpler transit/mode choice component.”
[Model Development and Validation Report, Page 4]

The following are ways in which the LCTM inherits from, and in some cases differs from, the MWCOC model:

- The MWCOC model only incorporates CLRP approved connections. The CLRP network was not as robust as the CTP network at the time of both studies.
- New TAZs were developed using primarily smaller TAZs in Loudoun County and larger TAZs outside Loudoun County. These TAZs have a different numbering system than the MWCOC model, but follow some zone equivalency.
- Within Loudoun County, the MWCOC model has 282 zones that were subdivided to create 667 zones in County model.
- A set of districts was developed (aggregations of TAZs) to assist with summary and presentation of model data (inside Loudoun County).
- External stations remain the same as the MWCOC model, but are numbered differently.
- Land use input attributes were kept consistent with the MWCOC model, 2010 Loudoun County data was provided locally, while other county information came from Round 8.0 of the region's cooperative forecast for 2010.
- The highway network was based on the MWCOC 2010 highway network from model version 2.3.39.
- Minor modifications to the highway network were made to facilitate the new zone system including changing centroid connectors outside the county and providing more network detail inside the county.



- Trip generation rates are created through household submodels for size and income and are based on MWCOG information.
- Mode choice uses a simplified methodology that estimates transit travel that occurs completely within Loudoun County only.
- Inter-county transit trips are directly adapted from the MWCOG regional model using transit share by purpose.
- Time-of-day periods are consistent with the MWCOG definitions.
- The traffic assignment approach is a combination of MWCOG model concepts and parameters supplemented with a toll diversion model.

Traffic Forecasting Assumptions

The travel demand forecasts for this study were developed using the Loudoun County TDM. The model was built for base year 2010, and a design year of 2040. Base year model validation was performed to determine the validity of the model.

BASE YEAR MODEL VALIDATION

Before 2040 reasonableness was determined, it was important to look at the base year model to determine how it performed in the study area. A comparison was performed of 2010 VDOT AADT volumes with the 2010 County model volumes. Based on this data, the model produced comparable volumes compared to the VDOT results, with a few locations loading slightly high throughout the study area.

Based on the validation performed for the model as a whole, it was determined that additional calibration or validation of the model was not necessary.



Scenarios Addressed

The Loudoun County Board of Supervisors (Board) requested the following analyses:

- CTP network, with access to the airport modeled from various locations including from a future interchange at Loudoun County Parkway and Route 606 (Old Ox Road) as well as Loudoun County Parkway and US 50
 - *This is addressed in Scenarios 2A through 2C*
- VDOT Alternative 2, on the CTP network
 - *This is addressed in Scenario 2G*
- VDOT Alternative 3C, on the CTP network
 - *This is addressed in Scenario 2H*
- Airport access at alternate locations along Route 606 and US 50
 - *This is addressed in Scenarios 2D through 2E*
- Extension of the widening of Evergreen Mills Road west through to Northstar Boulevard, rather than terminating at Belmont Ridge Road, as is planned in the CTP
 - *This is addressed in Scenario 2F*

From these requests, 11 scenarios were analyzed to answer the Board's questions regarding various access points to the west side of the Dulles International Airport and analyze alternatives to the currently planned CTP network. These scenarios were grouped by the base roadway network assumptions. The first group has the currently planned CTP as their base network. The second group's base network consists of the CTP network with a modification of Northstar Boulevard as a controlled access facility. Descriptions of each scenario are as follows.

GROUP 1 SCENARIOS – CTP NETWORK AS PLANNED

This first group of scenarios incorporates the CTP as currently planned as the base of the roadway network.

- 1 CTP Network as Planned** – No modifications were made to the CTP network.

- 1A MWAA Socioeconomic Data for Airport TAZs** – This scenario does not incorporate changes to the CTP road network, but has alternate land use assumptions at the MWAA property TAZs than what is coded in the County model. The socioeconomic data used in the VDOT study for the airport TAZs were incorporated into the County model to show the most conservative (highest) assumption of development on MWAA property.

GROUP 2 SCENARIOS – MODIFIED CTP NETWORK: NORTHSTAR AS CONTROLLED ACCESS FACILITY

The second group of scenarios also incorporate the planned CTP network, with a revision of Northstar Boulevard. South of Braddock Road, these scenarios model Northstar Boulevard as a controlled access facility as it continues south into Prince William County. Outside of Loudoun County, this roadway is referred to as the Bi-County Parkway. Many of the scenarios in this group incorporate alternative locations of airport access on the western lands.

- 2 Northstar Boulevard as Controlled Access Facility (Bi-County Parkway)** – This is the base network of the group two scenarios.
- 2A Airport Access at Route 606/Loudoun County Parkway Interchange** – This scenario incorporates access to the airport directly from the Route 606 and Loudoun County Parkway interchange.
- 2B Airport Access at Route 606/US 50 Interchange** – This scenario incorporates access to the airport directly from the Route 606 and US 50 interchange.
- 2C Airport Access at Route 606/Loudoun County Parkway Interchange and Route 606/US 50 Interchange** – This scenario models airport access at both the Route 606 and Loudoun County Parkway interchange and Route 606 and US 50 interchange.



- 2D Airport Access along Route 606 between US 50 and Dulles Greenway** – This scenario models airport access from Route 606 at a location between the interchanges planned at Loudoun County Parkway and at the CTP planned connection of Westwind Drive.
- 2E Airport Access along US 50 between Route 606 and Tall Cedars Parkway** – Exploring other alternatives than access from Route 606, this scenario evaluates airport access along US 50, intersecting South Riding Boulevard.
- 2F Connect Evergreen Mills Road with Northstar Boulevard and extend east to Airport Property** – The current CTP plans to close Evergreen Mills Road between Shreveport Drive and Belmont Ridge Road. This scenario explores maintaining connection between Northstar Boulevard and Belmont Ridge Road as well as extending east beyond Route 606 to provide airport property access.
- 2G New Facility from Glascock Boulevard to Arcola Boulevard, with Airport Access at Route 606/Loudoun County Parkway Interchange (VDOT Alternative 2)** – This scenario is aimed to incorporate the proposed new alignment of Alternative 2 from the VDOT study into the planned CTP network. This alignment would follow Northstar Boulevard approximately 1 mile north of US 50, where it would then turn east for approximately 1.7 miles to intersect with Route 606. This alignment would include overpasses above Belmont Ridge Road and Evergreen Mills Road. Airport access would then be provided at the interchange at Route 606 and Loudoun County Parkway.

- 2H Airport Access at Route 606/US 50 Interchange; VDOT Alternative 3C modified to fit into the CTP network** – This scenario addresses a modified version of Alternative 3C from the VDOT study. In the VDOT study, two median-separated, dedicated lanes were modeled along US 50, reserved for airport traffic. Airport access was then assumed from the planned interchange at US 50 and Route 606/Loudoun County Parkway. This was modified to assume the CTP planned cross section of US 50, or a six-lane, divided limited access roadway.

Table 3 outlines the roadway network, land use assumptions, and airport access modeled in each of the eleven scenarios. **Figures 8-19** display the model networks of each scenario graphically.

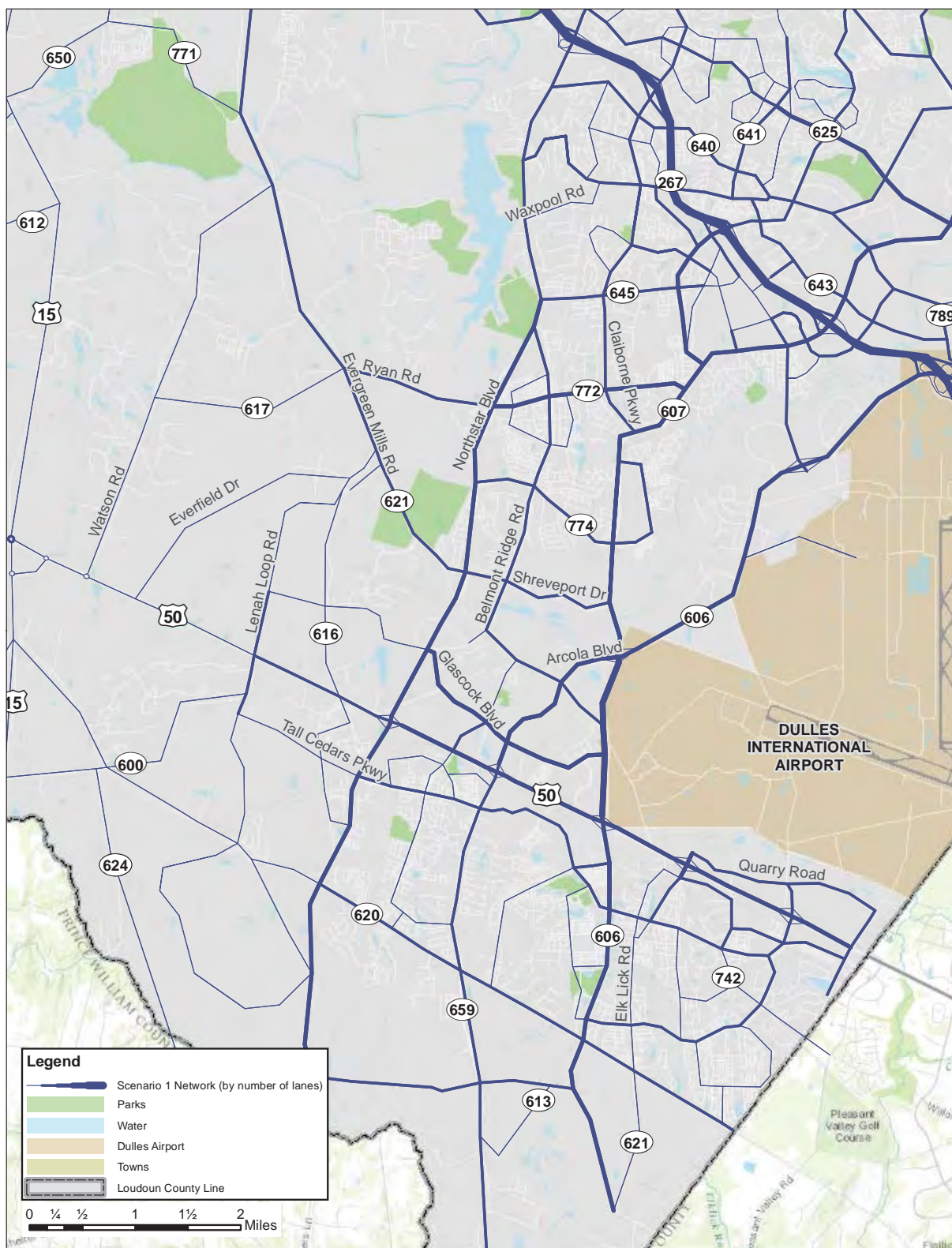


Table 2: Scenario Assumptions Comparison

Scenario	Northstar Blvd	Travel Demand	Airport Access	Notes
1	At-grade	Loudoun County TDM Land Use	Existing access points: ■ Trade Center PI ■ Beaver Meadow Rd (614) ■ Carters School Road	Baseline Scenario
1A	At-grade	Land Use on Airport TAZs from VDOT Study Assumptions	Same as existing (Scenario 1)	*See Table 1 for airport land use assumptions.
2	Access controlled	Loudoun County TDM Land Use	Same as existing (Scenario 1)	
2A	Access controlled	Loudoun County TDM Land Use	Route 606/Loudoun County Pkwy	
2B	Access controlled	Loudoun County TDM Land Use	Route 606/US 50	
2C	Access controlled	Loudoun County TDM Land Use	Route 606/Loudoun County Pkwy and Route 606/US 50	
2D	Access controlled	Loudoun County TDM Land Use	Route 606 between US 50 and Dulles Greenway	
2E	Access controlled	Loudoun County TDM Land Use	US 50 between Route 606 and Tall Cedars Pkwy	
2F	Access controlled	Loudoun County TDM Land Use	Evergreen Mills extension	Evergreen Mills connected to Northstar and extended to airport
2G	Access controlled	Loudoun County TDM Land Use	Route 606/Loudoun County Pkwy	New road from Glascock Blvd to Arcola Blvd to airport: VDOT Alt 2
2H	Access controlled	Loudoun County TDM Land Use	Route 606/US 50	VDOT Alt 3C modified to CTP



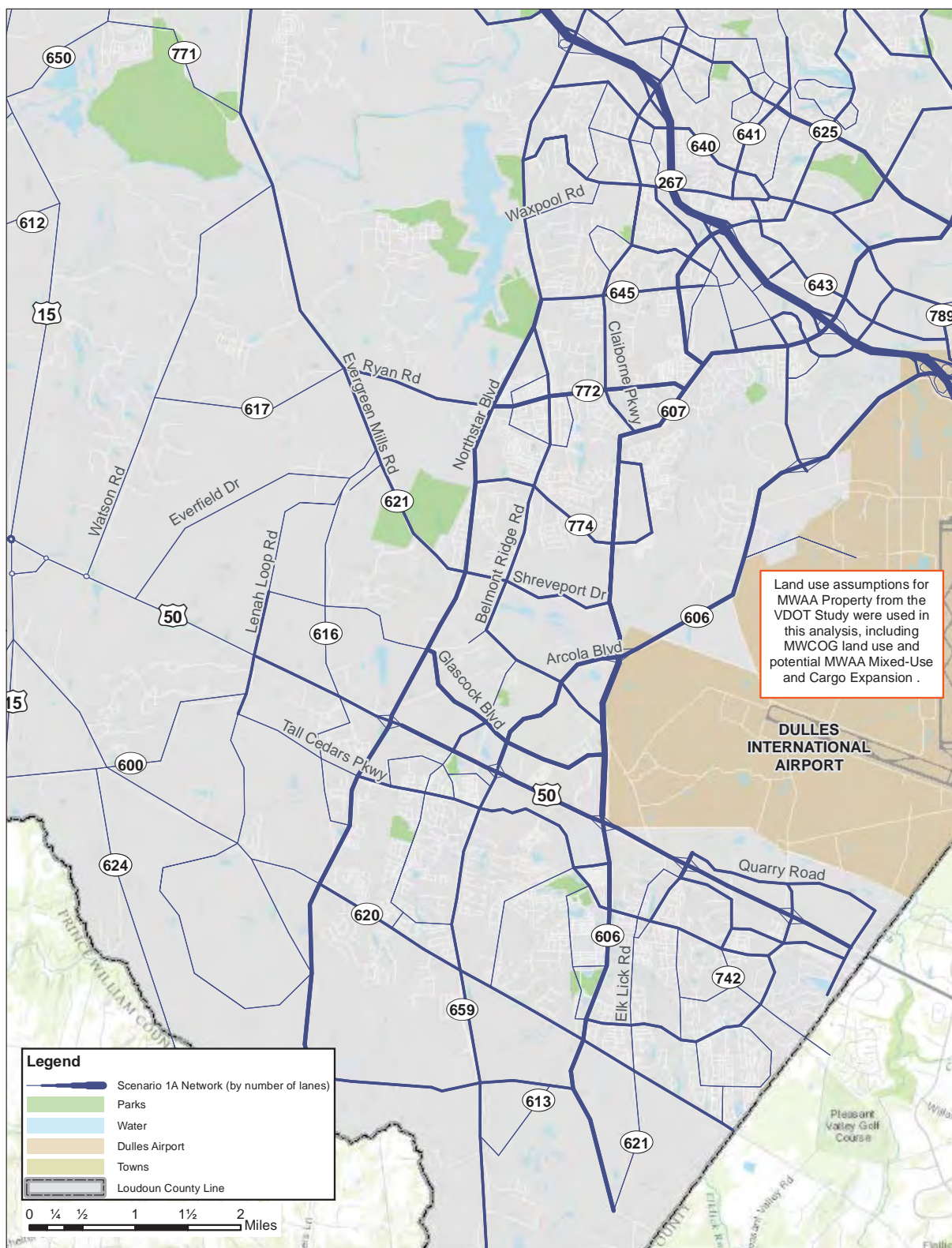
Figure 8: Scenario 1 Network



Basemap Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, Increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community



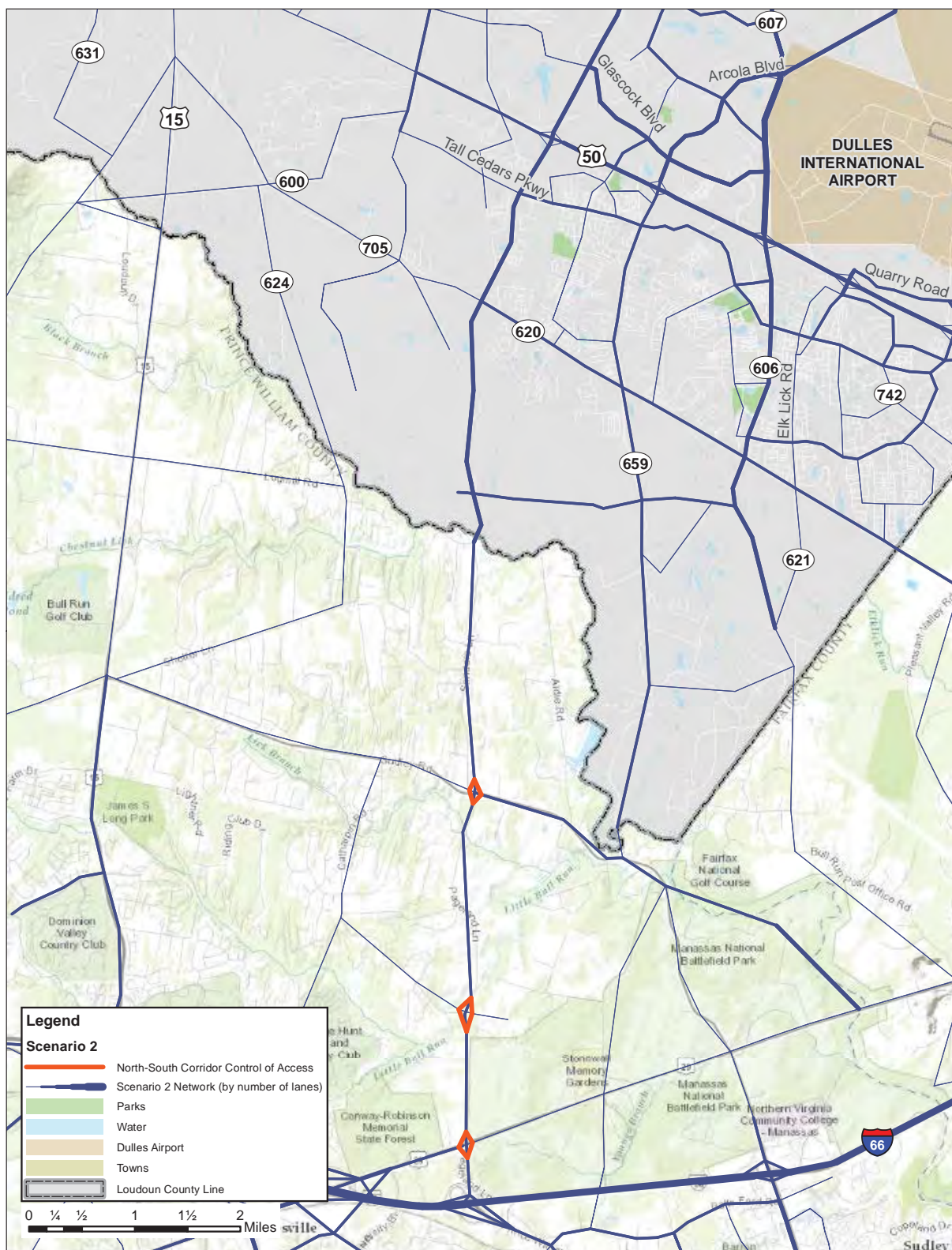
Figure 9: Scenario 1A Network



Basemap Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, MEIT, Esri China (Hong Kong), swisstopo, and the GIS User Community



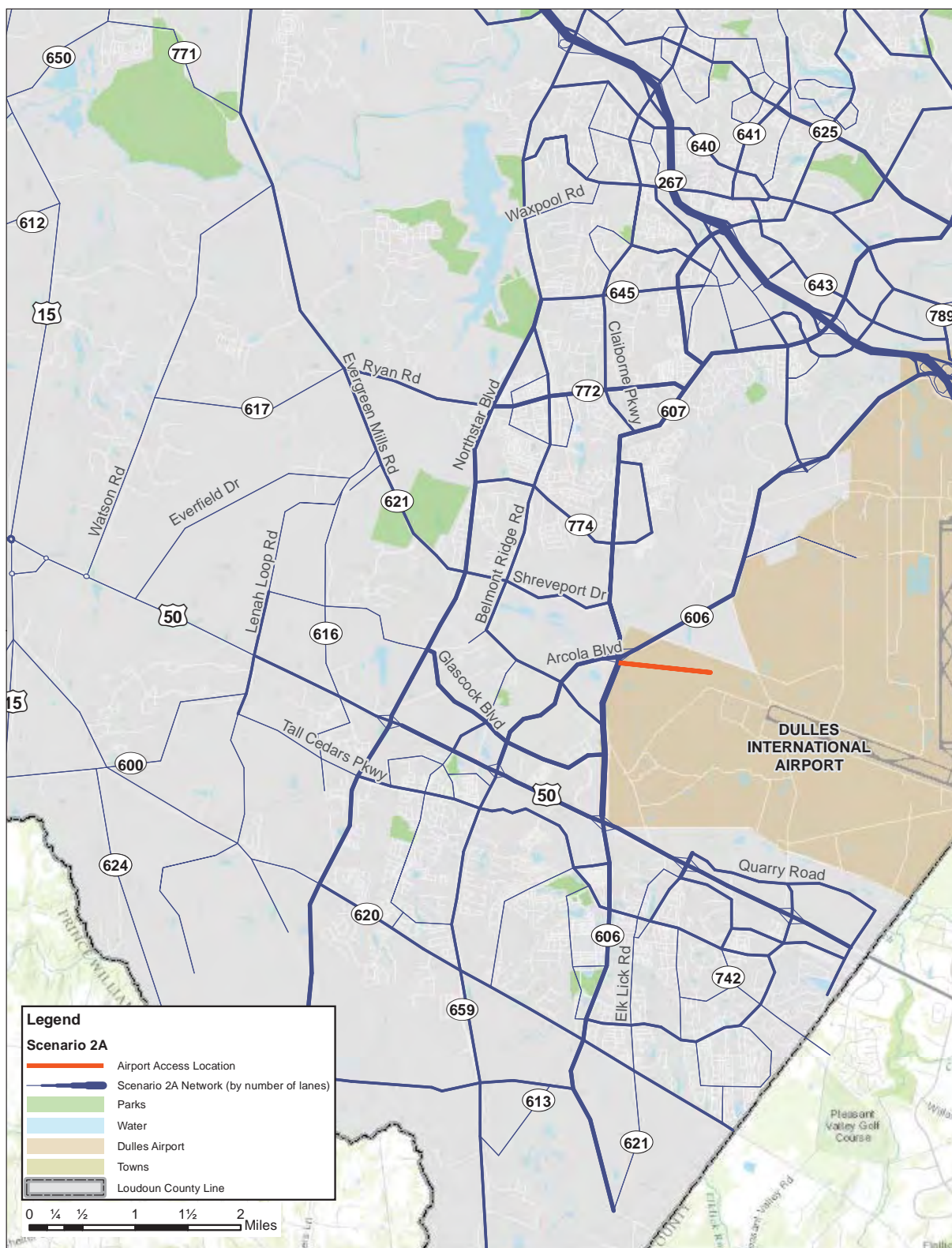
Figure 10: Scenario 2 Network



Basemap Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisslipo, and the GIS User Community



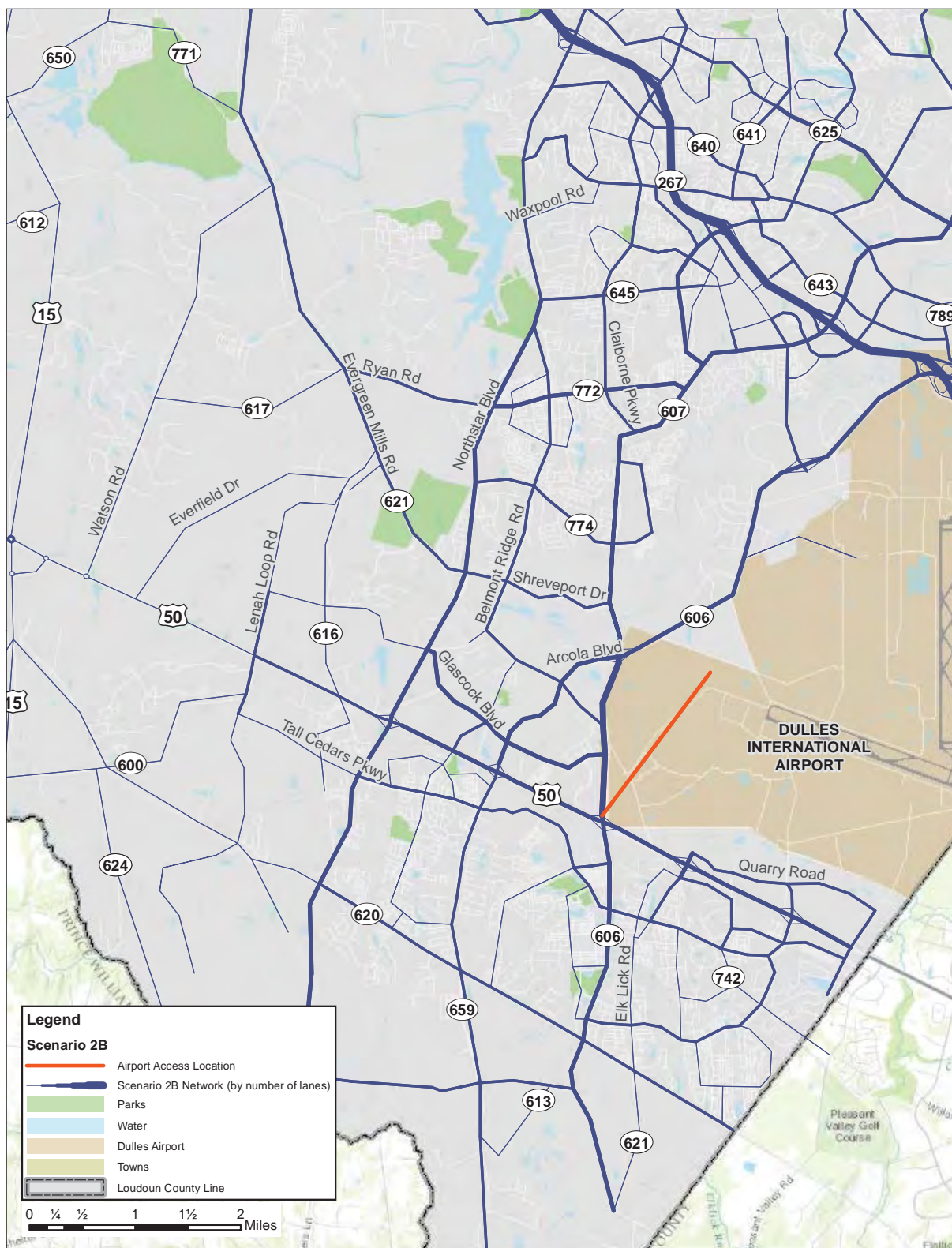
Figure 11: Scenario 2A Network



Basemap Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, MEIT, Esri China (Hong Kong), swisstopo, and the GIS User Community



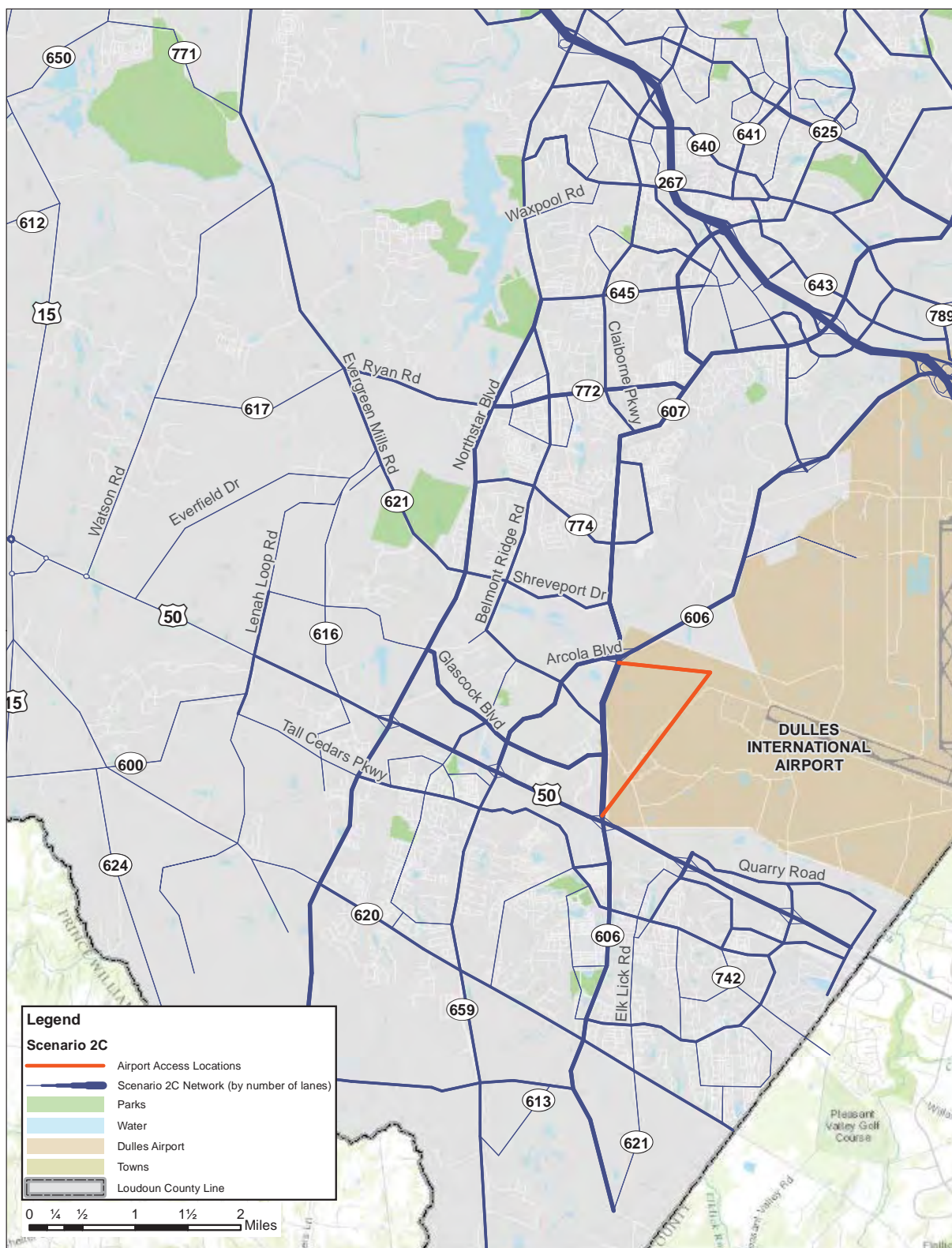
Figure 12: Scenario 2B Network



Basemap Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, MEIT, Esri China (Hong Kong), swisstopo, and the GIS User Community



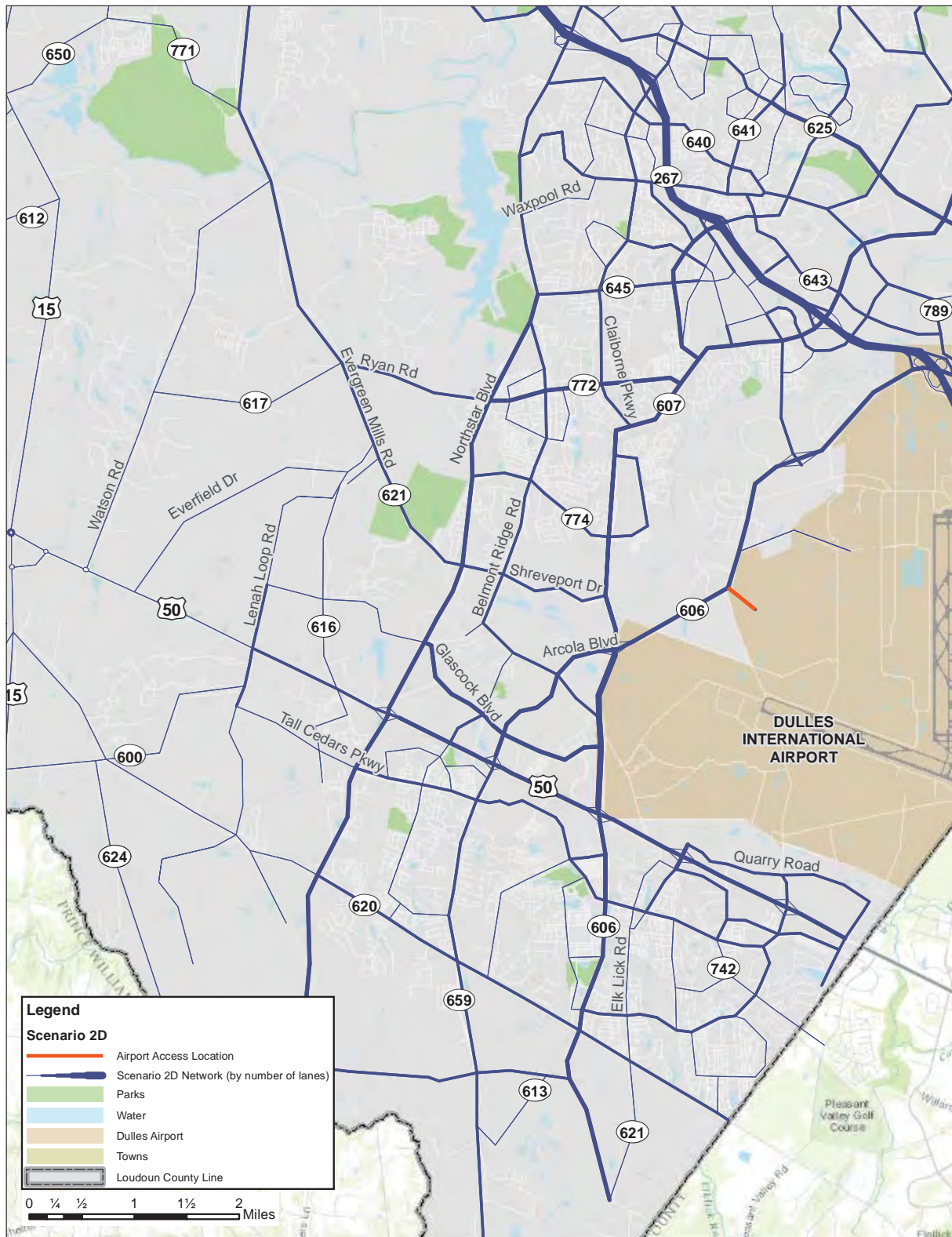
Figure 13: Scenario 2C Network



Basemap Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, MEIT, Esri China (Hong Kong), swisstopo, and the GIS User Community



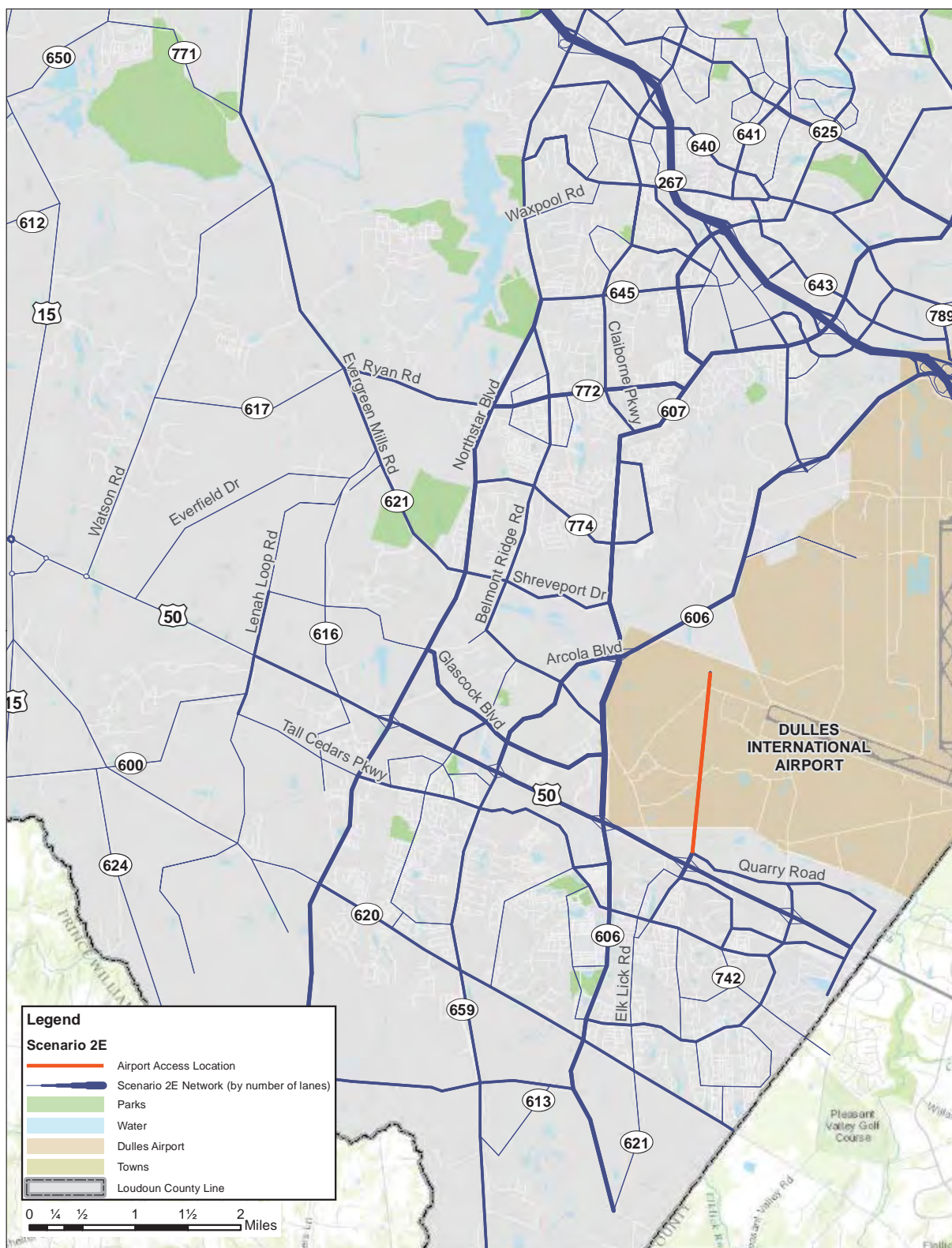
Figure 14: Scenario 2D Network



Basemap Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community



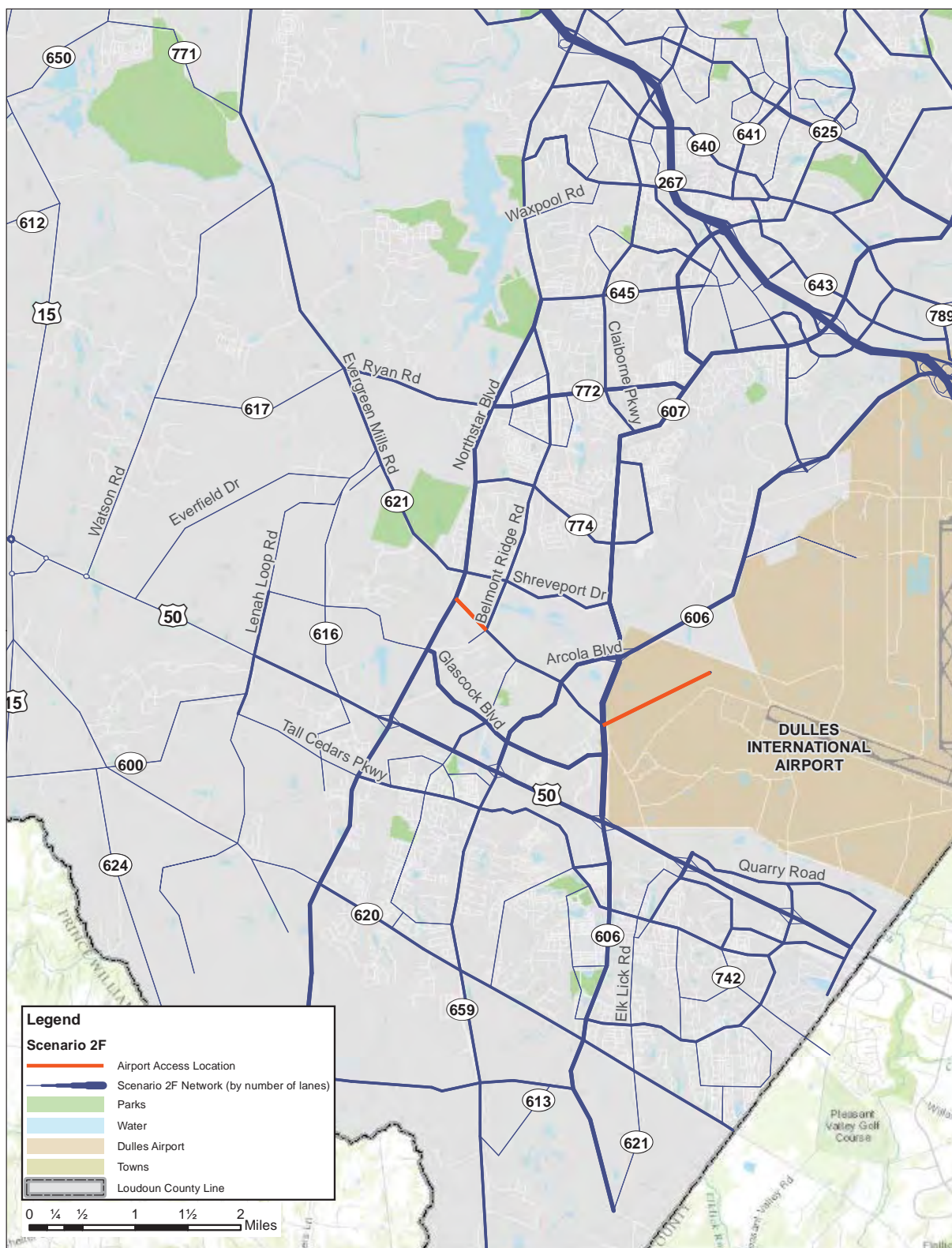
Figure 15: Scenario 2E Network



Basemap Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, MEIT, Esri China (Hong Kong), swisstopo, and the GIS User Community



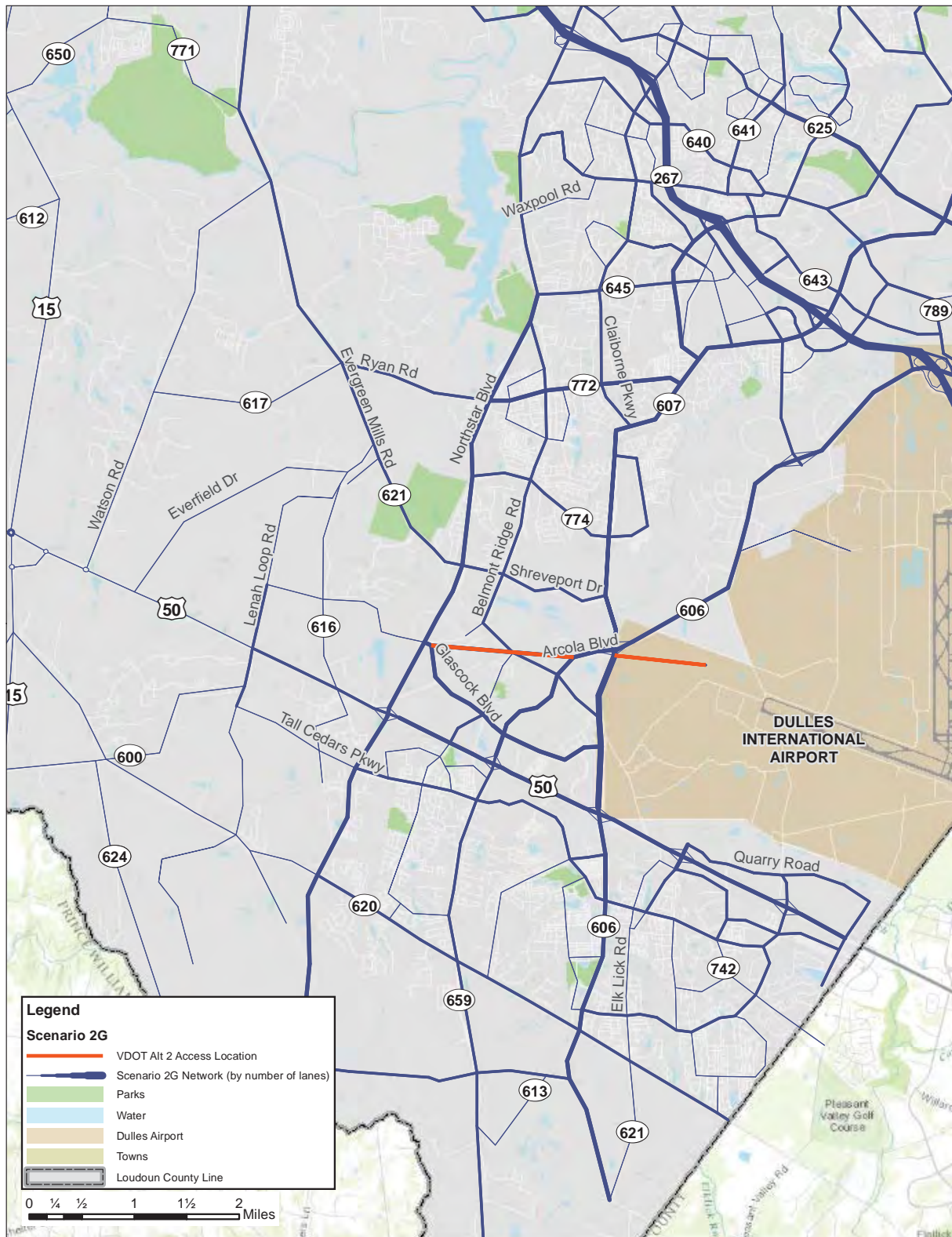
Figure 16: Scenario 2F Network



Basemap Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, MEIT, Esri China (Hong Kong), swisstopo, and the GIS User Community



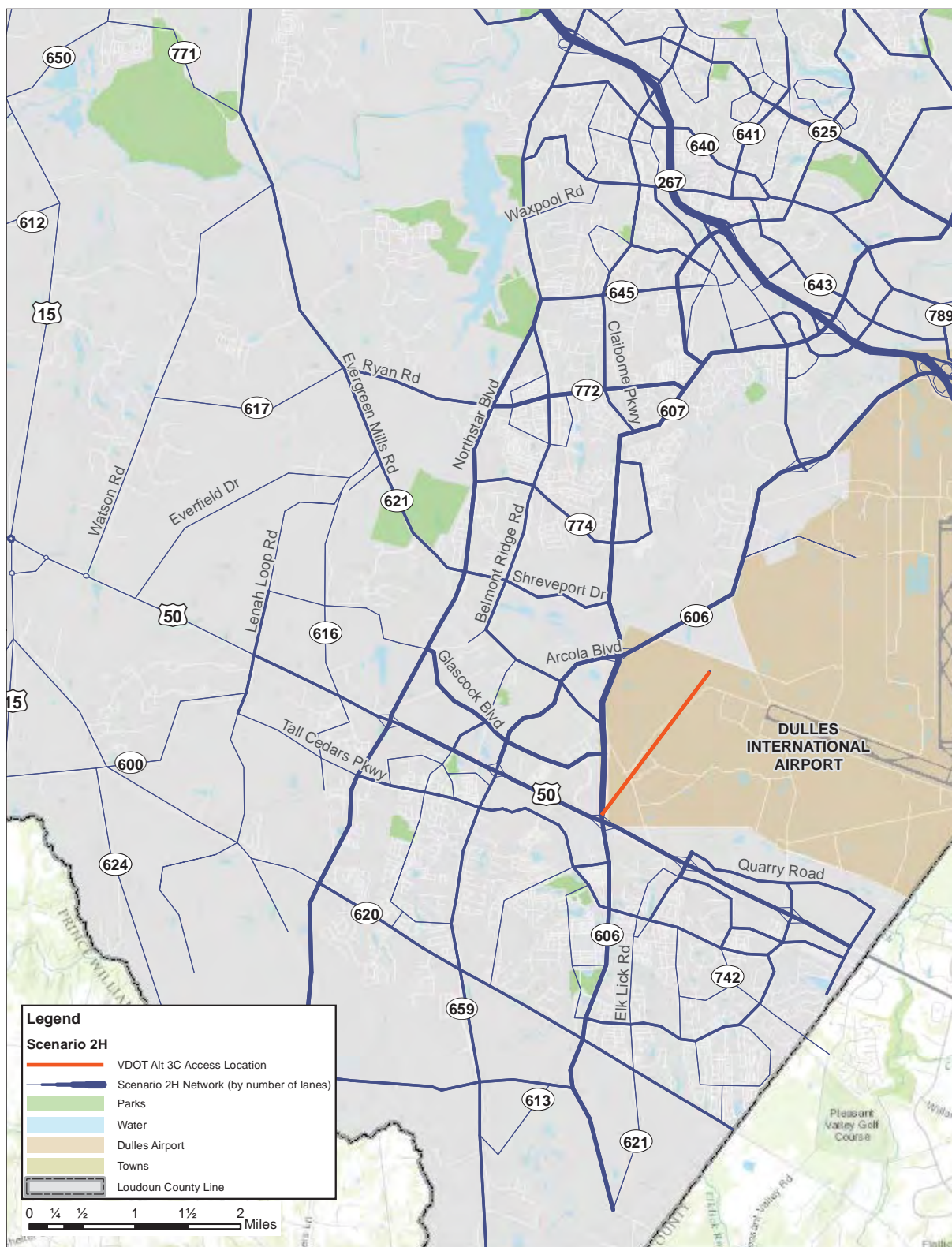
Figure 17: Scenario 2G Network



Basemap Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, MEIT, Esri China (Hong Kong), swisstopo, and the GIS User Community

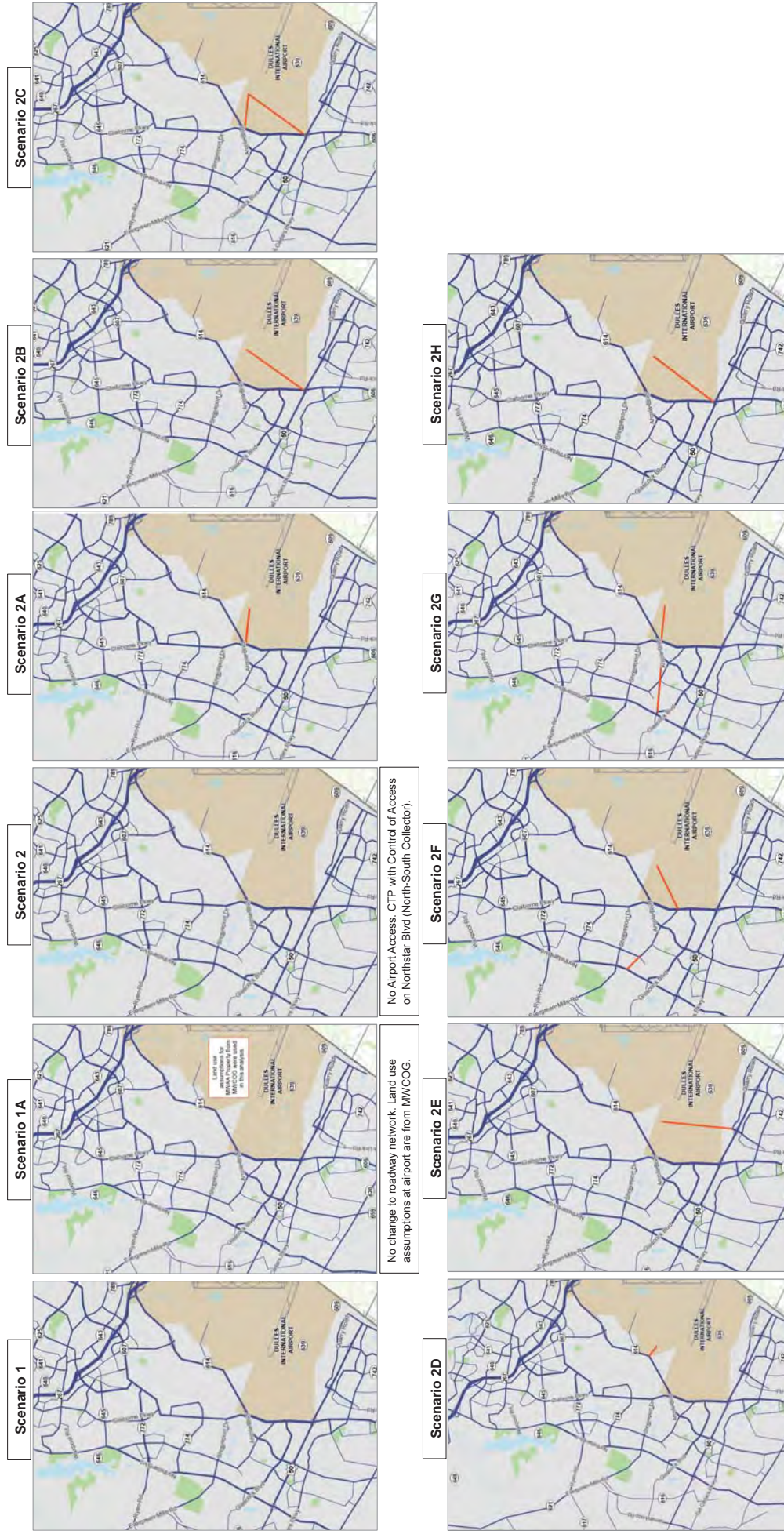


Figure 18: Scenario 2H Network



Basemap Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, MEIT, Esri China (Hong Kong), swisstopo, and the GIS User Community

Figure 19: Scenario Network Differences





Traffic Operations Analysis

ANALYSIS METHODOLOGY

Roadway link traffic volumes were forecast using the County model and used to calculate V/C ratios given the link capacity in the analysis year. Although a link level analysis of V/C ratios provides an idea of capacity and congestion of key roadways, it was also necessary to look at the network as a whole. While the model generally does a good job at forecasting travel demand at a system-level, it is not as reliable on a link-by-link basis. For this reason, travel sheds were evaluated by comparing the total capacity provided by parallel north-south and east-west connections.

A V/C ratio of greater than one is generally used as performance criterion, but this does not necessarily imply a need for roadway capacity enhancements. Roadway capacity enhancements based on peak hour V/C ratio involve major capital investments for the one or two worst hours of the day. Additionally, roadway congestion on a link over capacity could lead travelers to look for alternative driving patterns or alternate modes of transportation. For this reason, a more conservative V/C ratio threshold of 1.2 was used to color links red on the map.

The analysis included V/C ratios for the AM and PM peak hours and daily conditions as well as a comparison of volumes along the major roadway connections in the network.

VOLUME COMPARISON

Link volumes were compared across all of the scenarios for the AM and PM peak hours and daily conditions. Key network connections were looked at more closely to compare the impact on parallel north-south and east-west roadways. **Tables 4, 5, and 6** display the volume outputs for the AM peak, PM peak, and daily conditions, respectively. The results of this exercise show that there are nominal differences between each of the scenario runs.



Table 3: 2040 AM Peak Hour Volumes

Roadway	Link	Network Assumption 1 (CTP Network as Planned)		Network Assumption 2 (CTP Network with Northstar Blvd as a Controlled Access Facility)									
	From	To	Scenario 1	Scenario 1A	Scenario 2	Scenario 2A	Scenario 2B	Scenario 2C	Scenario 2D	Scenario 2E	Scenario 2F	Scenario 2G	Scenario 2H
North-South Corridors													
Loudoun County Parkway	Tall Cedars Pkwy	US Route 50	9,400	9,500	8,700	8,800	9,100	9,100	8,700	8,900	9,000	8,800	9,100
	US Route 50	Glascok Blvd	13,500	13,600	12,700	12,800	13,600	12,500	12,700	13,500	13,200	12,700	13,600
	Glascok Blvd	Old Ox Road	12,700	13,000	12,100	12,200	12,600	11,600	12,200	12,700	12,700	12,200	12,600
	Old Ox Road	Shreveport Dr	12,000	12,200	11,300	11,700	11,600	11,800	11,700	11,500	11,400	12,600	11,600
	Shreveport Dr	Creighton Rd	10,800	11,000	10,400	11,000	10,700	10,800	10,700	10,700	10,700	11,300	10,700
Old Ox Road	Loudoun County Pkwy/ Old Ox Rd	Carters School Rd	15,100	15,500	15,200	15,100	15,200	15,200	15,400	15,300	15,200	15,400	15,200
	Carters School Rd	Westwind Dr	15,100	15,400	15,100	15,100	15,200	15,200	15,400	15,300	15,200	15,400	15,200
West Spine Road/ Arcola Boulevard	Tall Cedars Pkwy	US Route 50	7,700	7,700	7,600	7,800	7,800	7,600	7,800	7,800	7,700	7,400	7,800
	US Route 50	Glascok Blvd	9,000	9,000	9,000	9,400	9,000	8,800	9,300	9,400	9,100	7,800	9,000
Belmont Ridge Road	Glascok Blvd	Loudoun County Pkwy	11,000	11,000	11,200	11,200	11,400	11,300	11,200	11,400	11,300	7,400	11,400
	Evergreen Mills Rd	Shreveport Dr	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	400	1,000	1,000
	Shreveport Dr	Creighton Rd	800	800	800	800	800	800	800	800	700	800	800
Northstar Boulevard	Tall Cedars Pkwy	US Route 50	8,200	8,300	10,100	10,100	9,900	10,300	10,300	10,100	10,100	10,300	9,900
	US Route 50	Glascok Blvd	7,200	7,400	8,300	8,400	8,300	8,600	8,200	8,300	8,400	10,700	8,300
	Glascok Blvd	Shreveport Dr	8,700	9,000	9,900	10,200	9,900	10,200	9,800	10,000	9,900	8,500	9,900
	Shreveport Dr	Creighton Rd	6,000	6,400	6,900	6,900	6,800	7,000	6,800	6,900	7,100	6,000	6,800
East-West Corridors													
Tall Cedars Parkway	Northstar Blvd	Gum Spring Rd/ West Spine Rd	2,300	2,100	2,300	2,300	2,500	2,600	2,600	2,600	2,600	1,700	2,500
	Gum Spring Rd/ West Spine Rd	Loudoun County Pkwy	2,300	2,300	2,300	2,200	2,200	2,300	2,200	2,300	2,200	2,200	2,200
	Loudoun County Pkwy	South Riding Blvd	3,900	4,100	4,400	4,300	4,200	4,300	4,400	4,500	4,300	4,200	4,200
US Route 50	West of Northstar Blvd	Northstar Blvd	6,500	6,500	6,600	6,500	6,600	6,400	6,600	6,500	6,400	5,900	6,600
	Northstar Blvd	Arcola Blvd	5,300	5,000	5,000	5,200	5,200	5,000	5,200	5,400	5,100	3,900	5,200
	Arcola Blvd	Loudoun County Pkwy	6,800	6,600	6,500	6,500	6,900	6,700	6,600	6,900	6,700	6,600	6,900
	Loudoun County Pkwy	South Riding Blvd	11,200	11,100	10,800	10,900	11,100	11,000	11,000	12,000	11,100	11,000	11,100
	West of Northstar Blvd	Northstar Blvd	200	300	300	400	300	300	300	300	300	1,300	300
Glascok Boulevard	Northstar Blvd	Arcola Blvd	1,900	1,900	1,900	2,000	1,900	1,900	1,900	2,000	1,800	2,200	1,900
	Arcola Blvd	Loudoun County Pkwy	1,200	1,300	1,100	1,100	1,200	1,100	1,200	1,100	1,300	1,100	1,200
Evergreen Mills Road	Belmont Ridge Road	Arcola Blvd	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,600	1,100	1,100
	Arcola Blvd	Loudoun County Pkwy	1,300	1,400	1,100	1,100	1,200	1,300	1,100	1,200	1,500	1,100	1,200
Shreveport Drive	Northstar Blvd	Belmont Ridge Rd	2,000	2,200	2,200	2,500	2,200	2,200	2,100	2,100	1,400	2,000	2,200
	Belmont Ridge Road	Loudoun County Pkwy	1,900	2,200	2,100	2,400	2,100	2,200	2,100	2,100	2,000	2,000	2,100



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WESTERN DULLES ACCESS STUDY

Table 4: 2040 PM Peak Hour Volumes

Roadway	Link	Network Assumption 1 (CTP Network as Planned)		Network Assumption 2 (CTP Network with Northstar Blvd as a Controlled Access Facility)											
		From	To	Scenario 1	Scenario 1A	Scenario 2	Scenario 2A	Scenario 2B	Scenario 2C	Scenario 2D	Scenario 2E	Scenario 2F	Scenario 2G	Scenario 2H	
North-South Corridors															
Loudoun County Parkway	Tall Cedars Pkwy		US Route 50	16,400	16,600	15,900	16,000	15,700	16,100	15,800	16,000	15,800	15,700		
	US Route 50		Glascok Blvd	23,600	23,900	23,000	23,300	23,700	22,700	23,700	23,500	23,700	23,500	22,500	23,700
	Glascok Blvd		Old Ox Road	22,000	22,100	21,400	21,900	22,000	21,300	21,400	22,200	22,300	22,200	21,500	22,000
	Old Ox Road		Shreveport Dr	18,600	19,000	18,500	18,600	18,600	18,900	18,500	18,900	18,000	18,300	19,300	18,600
	Shreveport Dr		Creighton Rd	17,600	16,800	16,800	17,200	17,000	16,600	17,000	17,000	17,100	17,400	17,400	17,000
Old Ox Road	Loudoun County Pkwy/ Old Ox Rd		Carters School Rd	23,700	24,700	23,900	23,600	23,500	24,200	23,600	23,500	23,300	24,000	23,500	
	Carters School Rd		Westwind Dr	24,600	25,300	24,700	24,200	24,100	24,600	24,200	24,100	23,900	24,600	24,100	
West Spine Road/ Arcola Boulevard	Tall Cedars Pkwy		US Route 50	11,700	11,600	11,500	11,600	11,700	11,400	11,400	11,700	11,400	11,300	11,700	
	US Route 50		Glascok Blvd	14,800	14,900	15,200	15,100	14,700	14,500	14,800	14,600	14,600	14,500	14,300	14,700
Belmont Ridge Road	Glascok Blvd		Loudoun County Pkwy	16,100	16,300	16,800	16,400	16,500	17,000	16,100	15,800	15,800	9,100	10,600	16,500
	Evergreen Mills Rd		Shreveport Dr	2,700	3,000	2,900	2,800	2,700	2,800	2,800	2,800	2,800	1,400	3,300	2,700
	Shreveport Dr		Creighton Rd	2,800	3,200	3,200	3,100	2,900	3,100	3,100	3,200	3,200	3,000	3,400	2,900
Northstar Boulevard	Tall Cedars Pkwy		US Route 50	13,500	14,100	16,300	16,000	16,200	16,500	16,500	16,400	16,700	17,000	16,200	
	US Route 50		Glascok Blvd	13,700	14,100	14,200	14,400	14,500	14,700	14,900	15,300	14,800	18,100	14,500	
	Glascok Blvd		Shreveport Dr	16,900	17,700	17,400	17,700	17,600	17,700	17,900	18,300	19,800	16,500	17,600	
	Shreveport Dr		Creighton Rd	12,200	12,900	12,700	12,400	12,900	12,900	13,000	12,500	13,300	12,100	12,900	
East-West Corridors															
Tall Cedars Parkway	Northstar Blvd		Gum Spring Rd/ West Spine Rd	4,100	4,000	4,000	4,000	4,300	4,100	3,700	4,200	4,100	3,100		4,300
	Gum Spring Rd/ West Spine Rd		Loudoun County Pkwy	4,900	5,000	4,900	4,900	5,000	5,000	5,000	5,100	4,800	4,900		5,000
	Loudoun County Pkwy		South Riding Blvd	5,700	5,600	6,100	6,300	6,400	6,200	6,300	7,100	6,400	6,200		6,400
US Route 50	West of Northstar Blvd		Northstar Blvd	9,800	9,800	10,300	10,400	10,600	10,200	10,200	10,500	10,200	9,400	10,600	
	Northstar Blvd		Arcola Blvd	9,200	9,100	8,600	8,100	8,200	8,200	7,600	8,400	8,400	7,100	8,200	
	Arcola Blvd		Loudoun County Pkwy	11,600	11,500	11,100	10,800	11,300	11,000	10,800	11,100	10,700	11,400	11,300	
	Loudoun County Pkwy		South Riding Blvd	18,900	19,100	18,600	18,500	18,700	18,600	18,400	19,400	18,400	18,500	18,700	
Glascok Boulevard	West of Northstar Blvd		Northstar Blvd	700	1,000	400	500	500	400	400	500	700	1,800	500	
	Northstar Blvd		Arcola Blvd	3,900	7,500	8,000	7,900	8,100	8,300	8,300	7,300	7,500	6,300	8,100	
	Arcola Blvd		Loudoun County Pkwy	2,800	2,900	2,900	2,900	2,900	2,900	2,900	2,800	3,000	2,800	2,900	
Evergreen Mills Road2	Belmont Ridge Road		Arcola Blvd	2,800	3,000	3,000	2,900	2,800	2,900	2,900	2,900	3,500	2,000	2,800	
	Arcola Blvd		Loudoun County Pkwy	2,500	2,800	3,100	2,800	2,800	2,900	3,100	2,400	3,100	2,900	2,800	
Shreveport Drive	Northstar Blvd		Belmont Ridge Rd	3,200	3,300	3,100	3,500	3,200	3,100	3,200	3,900	2,700	3,300	3,200	
	Belmont Ridge Road		Loudoun County Pkwy	2,800	2,900	2,800	3,400	2,900	2,800	2,900	3,900	4,100	2,700	2,900	



Table 5: 2040 Daily Volumes

Roadway	Link	Network Assumption 1 (CTP Network as Planned)		Network Assumption 2 (CTP Network with Northstar Blvd as a Controlled Access Facility)											
	From	To	Scenario 1	Scenario 1A	Scenario 2	Scenario 2A	Scenario 2B	Scenario 2C	Scenario 2D	Scenario 2E	Scenario 2F	Scenario 2G	Scenario 2H		
North-South Corridors															
Loudoun County Parkway	Tall Cedars Pkwy	US Route 50	52,400	52,700	50,000	50,400	50,700	51,000	49,600	49,600	50,600	49,200	50,700		
	US Route 50	Glascok Blvd	76,900	77,700	74,200	75,000	78,100	72,100	74,100	77,400	76,100	73,100	78,100		
	Glascok Blvd	Old Ox Road	71,500	72,800	69,100	70,200	72,000	67,000	69,100	72,000	72,900	68,400	72,000		
	Old Ox Road	Shreveport Dr	65,400	67,200	63,900	65,900	64,800	66,100	64,500	63,800	64,500	69,200	64,800		
	Shreveport Dr	Creighton Rd	57,700	59,000	57,000	59,300	58,200	58,800	57,400	58,200	58,700	60,900	58,200		
Old Ox Road	Loudoun County Pkwy/ Old Ox Rd	Carters School Rd	88,000	91,200	88,400	86,600	86,500	86,800	89,500	86,800	86,500	89,100	86,500		
	Carters School Rd	Westwind Dr	86,700	88,500	87,100	86,400	86,300	86,600	88,300	86,500	86,300	88,800	86,300		
West Spine Road/ Arcola Boulevard	Tall Cedars Pkwy	US Route 50	47,700	47,500	47,300	47,700	47,900	47,400	47,600	47,600	47,300	44,400	47,900		
	US Route 50	Glascok Blvd	55,800	56,100	56,600	57,000	55,400	56,000	56,400	56,400	56,100	49,000	55,400		
	Glascok Blvd	Loudoun County Pkwy	60,800	61,300	62,500	62,200	61,800	61,300	62,700	61,100	61,300	41,300	61,800		
Belmont Ridge Road	Evergreen Mills Rd	Shreveport Dr	7,400	7,700	7,500	7,500	7,400	7,400	7,500	7,500	3,200	8,000	7,400		
	Shreveport Dr	Creighton Rd	6,300	6,700	6,600	6,600	6,400	6,500	6,600	6,700	6,400	6,900	6,400		
	Tall Cedars Pkwy	US Route 50	38,100	38,600	46,900	46,700	46,600	47,000	46,600	47,000	47,600	51,800	46,600		
Northstar Boulevard	US Route 50	Glascok Blvd	37,500	37,900	41,100	41,600	41,500	41,900	41,400	42,400	41,600	59,500	41,500		
	Glascok Blvd	Shreveport Dr	46,100	47,000	50,000	50,600	50,400	50,800	49,900	51,400	50,100	44,500	50,400		
	Shreveport Dr	Creighton Rd	32,000	33,200	34,800	34,500	34,700	35,100	34,800	34,600	35,600	31,300	34,700		
East-West Corridors															
Tall Cedars Parkway	Northstar Blvd	Gum Spring Rd/ West Spine Rd	16,400	15,800	14,500	14,500	15,000	14,400	14,300	15,000	14,900	13,900	15,000		
	Gum Spring Rd/ West Spine Rd	Loudoun County Pkwy	10,600	10,700	10,500	10,700	10,800	10,700	10,400	11,100	11,200	9,600	10,800		
	Loudoun County Pkwy	South Riding Blvd	28,900	29,000	30,000	30,200	30,400	30,000	30,300	32,000	30,200	29,800	30,400		
	West of Northstar Blvd	Northstar Blvd	36,100	36,100	37,000	37,100	37,300	36,800	36,900	37,000	36,800	35,400	37,300		
US Route 50	Northstar Blvd	Arcola Blvd	32,700	32,200	31,700	31,400	31,600	31,500	31,000	32,500	31,600	24,600	31,600		
	Arcola Blvd	Loudoun County Pkwy	41,200	32,100	39,900	39,800	42,000	41,000	39,800	41,600	40,100	40,500	42,000		
	Loudoun County Pkwy	South Riding Blvd	68,100	66,300	66,800	66,900	67,600	67,300	66,900	72,500	67,100	66,800	67,600		
	West of Northstar Blvd	Northstar Blvd	1,300	1,100	1,000	1,300	1,100	1,100	1,100	1,300	1,400	3,900	1,100		
Glascok Boulevard	Northstar Blvd	Arcola Blvd	11,900	12,100	12,300	12,200	12,100	12,200	12,000	12,200	11,400	14,200	12,100		
	Arcola Blvd	Loudoun County Pkwy	8,500	10,900	8,300	8,400	8,300	8,000	8,500	8,000	9,200	7,600	8,300		
Evergreen Mills Road2	Belmont Ridge Road	Arcola Blvd	8,900	9,100	9,200	8,800	8,700	8,800	9,100	8,800	10,100	8,600	8,700		
	Arcola Blvd	Loudoun County Pkwy	8,400	8,100	8,900	8,400	8,300	8,600	8,800	8,000	9,300	8,400	8,300		
Shreveport Drive	Northstar Blvd	Belmont Ridge Rd	11,800	14,000	12,000	12,900	12,200	12,200	12,000	12,600	8,200	11,500	12,200		
	Belmont Ridge Road	Loudoun County Pkwy	11,200	13,200	11,500	12,600	11,700	11,800	11,600	12,400	12,500	10,900	11,700		



V/C Ratio Analysis

Mapping of each scenario's V/C ratios was developed to display the capacity of the network in a visual manner. This allowed for easier comparison of the results with the use of a color scale to highlight the links at or above capacity. This color scale is defined in **Table 6**, and is the standard for Loudoun County.

Table 6. V/C Ratio Color Table

V/C Ratio	Color
<0.85	Green
0.85 - 1.00	Yellow
1.01 - 1.20	Orange
> 1.20	Red

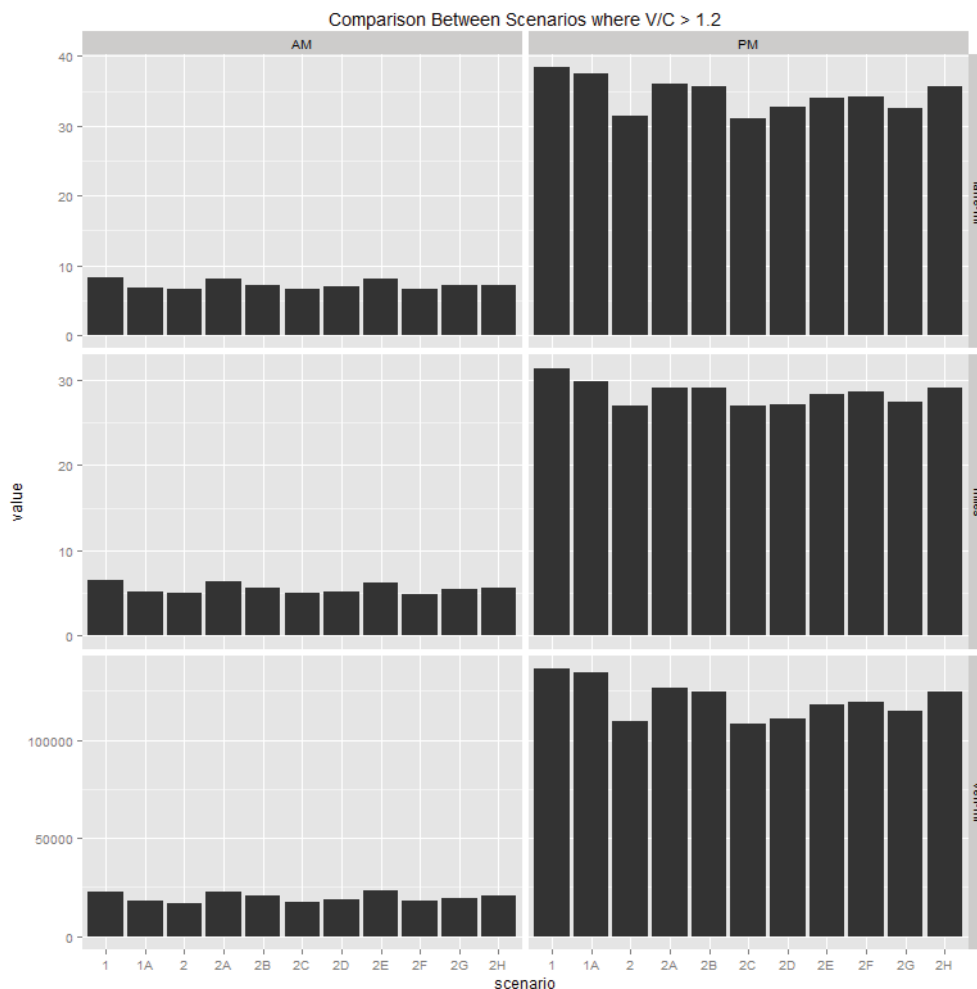
These thresholds were developed for review of the Loudoun County Model. There currently are no industry standards for V/C Ratio link analysis.

Similarly to the volume comparison, there are very few noticeable differences from one scenario to the next. The network is not greatly affected by the introduction of an access road to the west side of the airport property or by the examined changes to the CTP network.

In review of the AM peak, PM peak, and daily results, it appears that the PM peak is considerably worse than the AM peak. This is the timeframe in which the highest V/C ratios were observed. **Figure 20** shows the comparison between scenarios by three different measures of effectiveness, each telling the same story. The graphs show the number of lane-miles, miles, and vehicle-miles with V/C greater than 1.2, respectively. It also shows the differences between scenarios is minimal.

The maps of the PM peak hour link V/C ratios for all of the scenarios are provided in **Appendix B**. Similar figures for the AM peak hour and daily conditions are provided in **Appendix C**.

Figure 20: Scenario Comparison by lane-miles, miles and vehicle miles





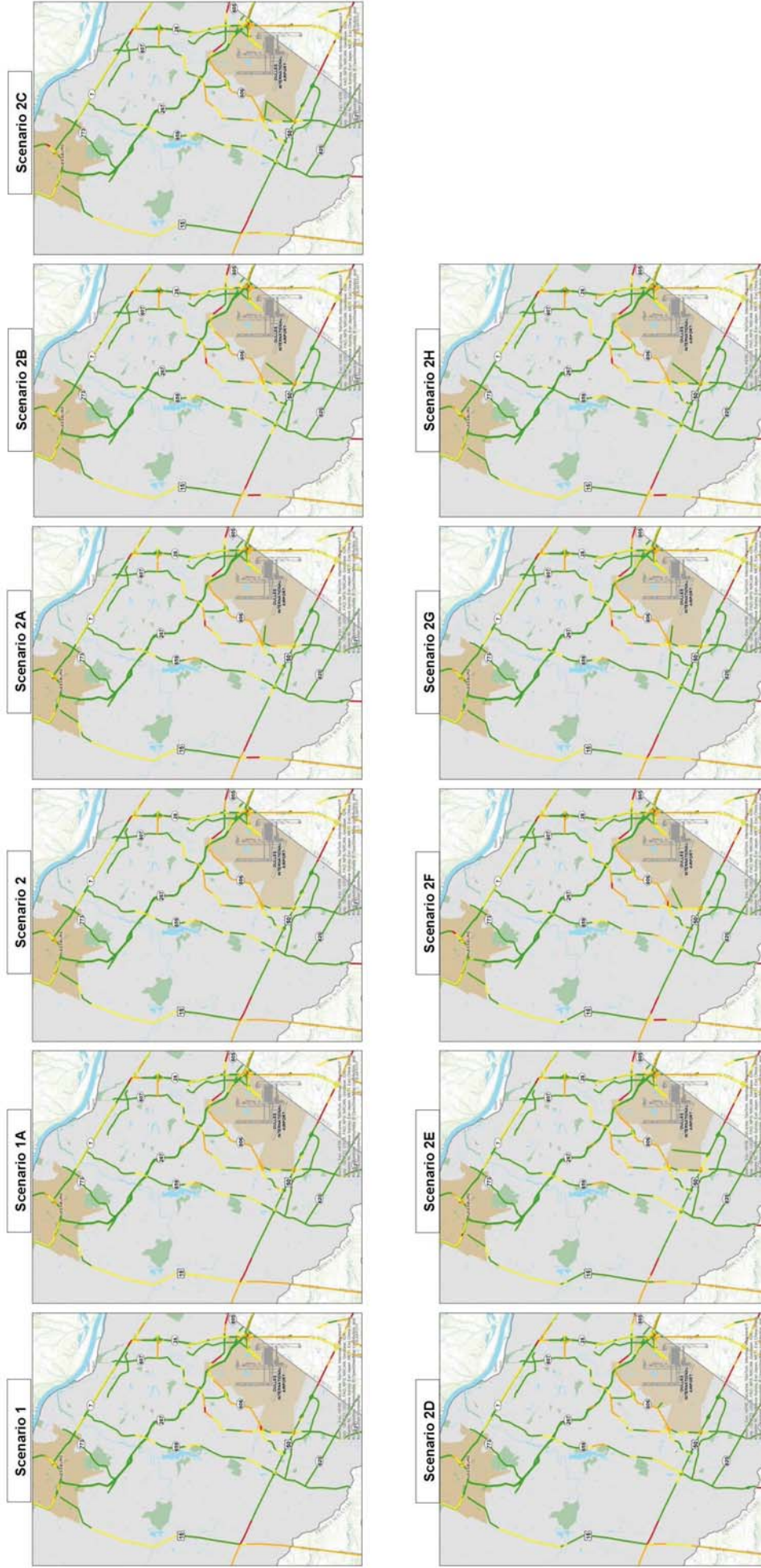
WIDER STUDY AREA REVIEW

In addition to reviewing the V/C ratios of the major links within the immediate West Dulles Area, the study explored the impact of the various scenarios on the surrounding key facilities in eastern Loudoun County. Roadways of interest included Route 15, Route 7, Route 28, along with other major arterials and collectors in between.

Mapping of the V/C ratios enforces the previous statement that the placement of an airport access road or the explored alterations to the CTP have little impact on the surrounding roadway network. **Figures 21** shows an overview of the wider study area results. **Appendix D** contains the full size maps of the PM peak hour results for this V/C Ratio analysis.



Figure 21: 2040 Peak Hour PM Peak Hour V/C Ratio Maps





Analysis Findings

CTP ULTIMATE CONFIGURATION

The ultimate configuration of the CTP network, analyzed in Scenario 1, shows that the planned network can handle the projected development of the airport property and the West Dulles Area as a whole. Even at the heaviest saturation in the PM peak hour, there are few links that exceed capacity. Some locations that experience heavier congestion are:

- Route 606 from Loudoun County Parkway to the Dulles Greenway
- Loudoun County Parkway from Ryan Road to Shellhorn Road
- US 50 west of Lenah Road

Route 606 and Loudoun County Parkway will provide major routes to future development at the airport, the planned Metrorail Stations (Route 606 and Route 772), and the anticipated development surrounding the new Metrorail Stations. It can be expected that in the PM peak hours of travel, these routes will experience some congestion. However, there are other facilities surrounding the Metrorail Stations that offer alternate routes through the planned transit and development centers that are not projected to exceed capacity. Robust bus transit options are provided in this region and are likely to increase with the incoming of Metrorail. This could alleviate some of the congestion displayed in the V/C ratio analysis.

US 50, to the west side of the study area, results in heavier congestion due to the smaller cross section and reduced capacity as it enters the more rural portions of the County.

SCENARIO REVIEW

Though the impact is minimal, there are some effects noticed by the scenario changes.

- Location of airport access along Route 606 does not impact the network at a link-level analysis. Should the County proceed with exploring access along Route 606, a more micro-level analysis would be advised.
- Airport access along US 50 relieves some congestion on Loudoun County Parkway and Route 606.
- Adding the Evergreen Mills Road connection relieves Tall Cedars Parkway, Braddock Road, and US 50, but these facilities perform adequately without the connection in place.

The analysis concludes that the CTP road network is adequate for any growth within Dulles International Airport based on current land use plans in place today. There is no need to expand currently planned CTP network of for new roads to be expressed to serve the Dulles International Airport growth as planned today.

All scenarios tested show that the CTP as planned serves the growth planned for this area of the County.

To goal of the study was to provide adequate and appropriate transportation access to Dulles International Airport and for the West Dulles area in a manner consistent with the principles embodied in the Loudoun County Comprehensive Plan and Countywide Transportation Plan.

This goal has been achieved through thorough analysis of the area using the adopted Loudoun County transportation model. The model proved to be an effective tool for this analysis.

Appendix A

LOUDOUN COUNTY

PROJECT NUMBER: R000-053-032, P101; UPC NO. 103929

FEDERAL PROJECT NUMBER: STP-5A01(454)



TECHNICAL REPORT

TRANSPORTATION & TRAFFIC

SUBMITTED PURSUANT TO 42 U.S.C. 4332(2)(C)

DULLES AIR CARGO, PASSENGER
& METRO ACCESS HIGHWAY

PREPARED BY



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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION &
VIRGINIA DEPARTMENT OF TRANSPORTATION

Table of Contents

Chapter 1.0	INTRODUCTION / PROJECT BACKGROUND	1
Chapter 2.0	EXISTING CONDITIONS	2
2.1	Study Area	2
2.2	Existing Roadway Conditions.....	3
2.3	Existing Traffic Volumes	4
2.4	Safety Analysis	5
Chapter 3.0	ALTERNATIVES CONSIDERED	7
3.1	Alternative 1: No Build.....	7
3.2	Alternative 2: New Alignment.....	7
3.3	Alternative 3A: US Route 50 Elevated	8
3.4	Alternative 3B: Loudoun County: Countywide Transportation Plan (CTP).....	8
3.5	Alternative 3C: US Route 50 Limited Access and Loudoun County Parkway At-Grade	8
Chapter 4.0	TRAFFIC FORECASTING.....	10
4.1	Base Year Calibration and Validation	10
4.2	MWAA Western Lands	12
4.3	Future Year Model No Build Network	13
4.4	Future Year Growth and Demographics	13
4.5	ADT and TMC Methodology	14
4.6	Future Alternatives Modeling Results	16
4.7	Environmental Traffic Data	19
Chapter 5.0	TRAFFIC OPERATIONS ANALYSIS.....	20
5.1	Methodology and Assumptions	20
5.2	Existing Conditions.....	21
5.3	Alternative 1 (No Build)	24
5.4	Build Alternatives	26
5.5	Comparison of Build Alternatives	31

List of Tables

Table 2-1: Roadway Segment Crash Rate Analysis	6
Table 4-1: Model Validation – Volume to Count Ratios by Facility (2012)	11
Table 4-2: Study Area Demographics.....	15
Table 4-3: Model Alternatives – ADT and Number of Lanes	18
Table 5-1: Intersection LOS Descriptions	20
Table 5-2: Roadway Segment LOS Descriptions	21
Table 5-3: Existing (2012) LOS at Intersections	22
Table 5-4: Alternative 1 (No Build) LOS at Intersections	24
Table 5-5: Segment LOS for Existing Conditions and all Alternatives	32

List of Figures

Figure 2-1: Project Study Area	2
Figure 4-1: Western Lands Expansion.....	12
Figure 4-2: Future (2040) No Build Networks	15
Figure 4-3: Model Network for Alternatives 1, 2, 3A, 3B, and 3C	17
Figure 5-1: Existing Conditions (2012) LOS.....	23
Figure 5-2: Alternative 1: No Build (2040) LOS.....	25
Figure 5-3: Alternative 2: New Alignment (2040) LOS.....	27
Figure 5-4: Alternative 3A: Elevated Route 50 (2040) LOS	28
Figure 5-5: Alternative 3B: Loudoun County CTP (2040) LOS	29
Figure 5-6: Alternative 3C: US Route 50 Limited Access and Loudoun County Parkway At-Grade (2040) LOS.....	30

Appendices

Appendix A: Traffic Count Data	A-1
Appendix B: Forecasting Data.....	B-1
Appendix C: Environmental Traffic Data (ENTRADA Output) and HCS Outputs.....	C-1

Chapter 1.0 INTRODUCTION / PROJECT BACKGROUND

The Virginia Department of Transportation (VDOT), in cooperation with the Federal Highway Administration (FHWA), is evaluating a potential limited access roadway west of the Washington Dulles International Airport (IAD) in Loudoun County, Virginia. The proposed Dulles Air Cargo, Passenger and Metro Access Highway (DACPMAH) would extend from the interchange of the planned Northstar Boulevard / Bi-County Parkway (VA Route 411) and John Mosby Highway (US Route 50) to the planned MWAA Western Lands Expansion Aviation Support Roadway beginning at Loudoun County Parkway. Presently, air cargo and passenger services to IAD are accessible from the Dulles Airport Access and Toll Road (VA Route 267) to the east and from Old Ox Road (VA Route 606) to the north from Ariane Way.

Recently, Loudoun County's Board of Supervisors moved to adopt a resolution in support of the North-South Corridor of Statewide Significance, which identified a north-south corridor that would pass near IAD. A portion of the proposed project is located within the same corridor as the planning-level study area for the North-South Corridor and follows Loudoun County's resolution to support the state's planning efforts and accommodate growth in and around IAD. In addition, VDOT has identified the DACPMAH as a priority project for the region.

The proposed project would address current and forecasted transportation network deficiencies, including access, congestion, and inadequate system linkage associated with existing transportation facilities to the north, south, and west of IAD as well as planned development within and around the airport. The need for the proposed project is also based on future transportation needs identified in Loudoun County's Comprehensive Plan and on current and future economic development resulting from airport development activities and the planned Metrorail Silver Line expansion.

The purpose of this study is to document the findings of the transportation analyses performed in support of the Environmental Assessment for the proposed Dulles Air Cargo, Passenger and Metro Access Highway and generate environmental traffic data required for the associated air and noise studies for the proposed project.

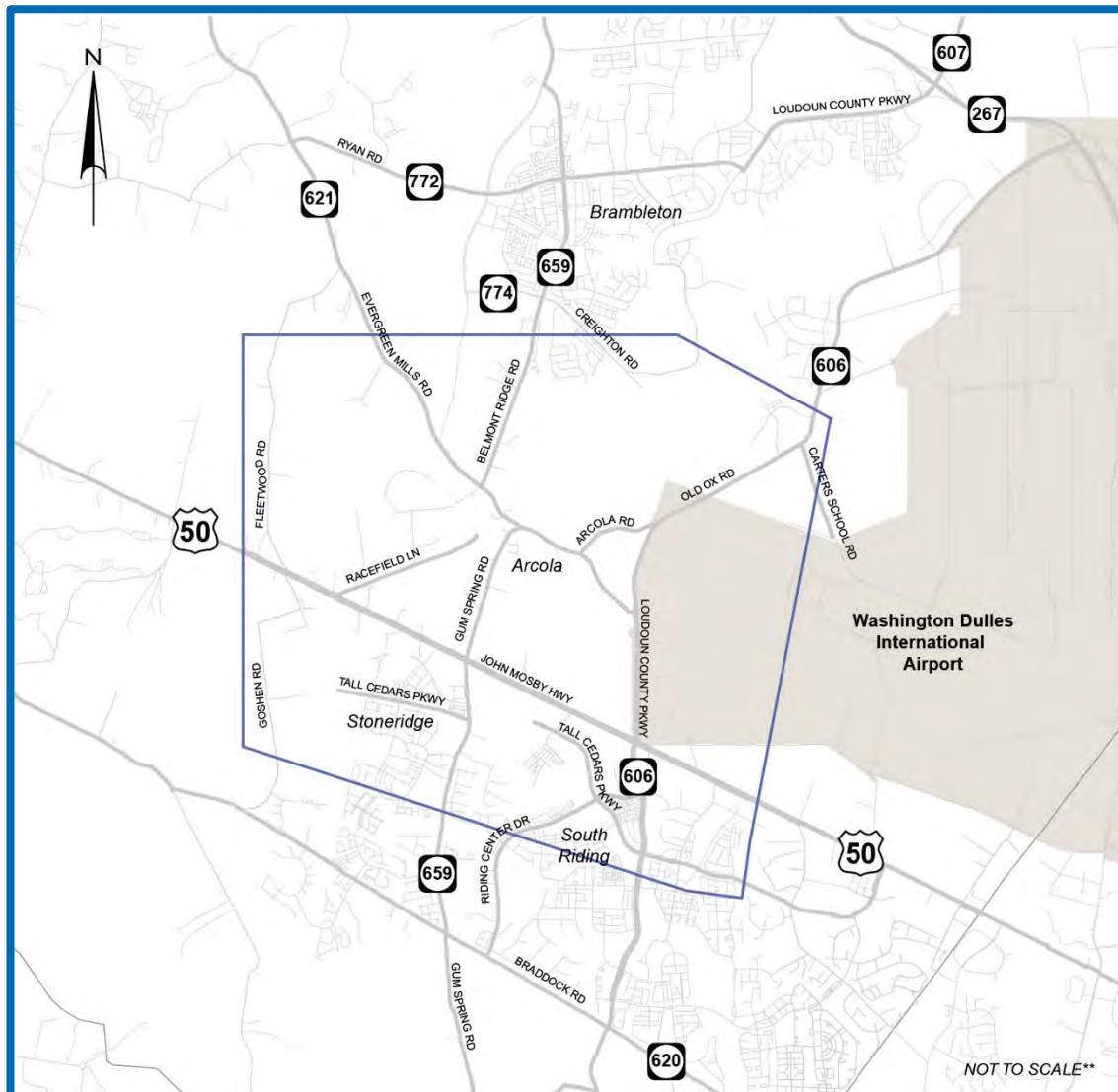
Prior to the issuance of this EA, upon the identification of Location Study Corridors and preliminary alternatives for the proposed project, VDOT conducted an initial environmental analysis and announced the availability of the *Dulles Air Cargo, Passenger and Metro Access Highway Draft Environmental Assessment* on May 24, 2013 for a 30-day public review and comment period. A subsequent location study public hearing was held on June 13, 2013. Additional stakeholder meetings and agency correspondence efforts also took place following the release of the initial draft EA. In order to address comments and additional information that were made available during the public comment period, the location study public hearing, agency consultation, and stakeholder meetings following the preliminary draft EA; identify and evaluate additional proposed alternatives; and provide greater detail regarding the impacts and benefits of each alternative, VDOT has revised the EA in accordance with FHWA regulations at 23 CFR § 771.119.

Chapter 2.0 EXISTING CONDITIONS

2.1 Study Area

As illustrated in Figure 2-1, the study area for the traffic and transportation study extends from Creighton Road (VA Route 774) to the north, Tall Cedars Parkway (VA Route 2200) to the south, Fleetwood Road / Goshen Road (VA Route 616) to the west, and Old Ox Road (VA Route 606) and the Dulles Airport to the east, focusing on the Dulles South portion of Loudoun County and the transportation needs and issues associated with this region.

Figure 2-1: Project Study Area



2.2 Existing Roadway Conditions

Several major roadways are located within the study area and are described below:

John Mosby Highway (US Route 50) is a four-lane divided rural minor arterial west of Pinebrook Drive (VA Route 742), a four-lane divided urban principal arterial east of Pinebrook Drive to Loudoun County Parkway (VA Route 606) and a six-lane divided urban principal arterial east of Loudoun County Parkway (VA Route 606). The posted speed limit is 55 mph and US Route 50 serves several commercial, industrial, and residential properties with direct access. Within the study area, US Route 50 intersects several other major roads including Gum Spring Road (VA Route 659), Stone Springs Boulevard (VA Route 2625) and Loudoun County Parkway (VA Route 606) at signalized intersections.

Loudoun County Parkway (VA Route 606 / VA Route 607) is a four-lane divided urban collector north of US Route 50 to Evergreen Mills Road (VA Route 621), a two-lane undivided urban collector north of Evergreen Mills Road, and a four-lane divided urban local roadway south of US Route 50. The posted speed limit is 45 mph south of US Route 50 and 55 mph north of US Route 50. Loudoun County Parkway serves several commercial and residential properties with direct access south of US Route 50. Within the study area, Loudoun County Parkway intersects several other major roads including Evergreen Mills Road (VA Route 621), US Route 50, and Tall Cedars Parkway (VA Route 2200) at signalized intersections.

Old Ox Road (VA Route 606) is a two-lane undivided urban collector that begins at the intersection with Arcola Road (VA Route 842) and Loudoun County Parkway (VA Route 606). The posted speed limit is 55 mph. Old Ox Road serves commercial and residential properties.

Evergreen Mills Road (VA Route 621) is a two-lane undivided urban collector east of Belmont Ridge Road (VA Route 659) and a two-lane undivided rural minor collector west of Belmont Ridge Road. The existing posted speed limit is 35 mph within the study area. Evergreen Mills Road serves commercial and residential properties. Within the study area, Evergreen Mills Road intersects Belmont Ridge Road (VA Route 659), Gum Spring Road (VA Route 659), and Loudoun County Parkway (VA Route 606) at signalized intersections.

Gum Spring Road (VA Route 659) is a two-lane undivided rural collector south of Evergreen Mills Road (VA Route 621) to Tall Cedars Parkway (VA Route 2200). Gum Spring Road will be improved to a four-lane section south of US Route 50 to Tall Cedars Parkway. The posted speed limit is 35 mph north of US Route 50 and 45 mph south of US Route 50. Gum Spring Road serves several commercial and residential properties. Within the study area, Gum Spring Road intersects Evergreen Mills Road and US Route 50 at signalized intersections.

Belmont Ridge Road (VA Route 659) is a four-lane divided urban collector north of Shreveport Drive, and is a two-lane undivided urban collector south of Shreveport Drive. The posted speed limit is 45 mph. Belmont Ridge Road serves several residential properties. Within the study area, Belmont Ridge Road intersects Evergreen Mills Road (VA Route 621) at a signalized intersection.

Tall Cedars Parkway (VA Route 2200) is a four-lane divided local roadway that serves several commercial and residential properties. The posted speed limit is 45 mph. Within the study area, Tall Cedars Parkway intersects Loudoun County Parkway (VA Route 606) at a signalized intersection.

The following signalized intersections are contained within the study area:

- John Mosby Highway (US Route 50) at Stone Springs Boulevard (VA Route 2625)
- John Mosby Highway (US Route 50) at Gum Spring Road (VA Route 659)
- John Mosby Highway (US Route 50) at Hutchinson Farm Road
- John Mosby Highway (US Route 50) at Pinebrook Road (VA Route 827)
- John Mosby Highway (US Route 50) at Loudoun County Parkway (VA Route 606)
- John Mosby Highway (US Route 50) at South Riding Boulevard (VA Route 2201)
- Loudoun County Parkway (VA Route 606) at Tall Cedars Parkway (VA Route 2200)
- Loudoun County Parkway (VA Route 606) at Riding Center Drive
- Loudoun County Parkway (VA Route 606) at Evergreen Mills Road (VA Route 621)
- Gum Spring Road (VA Route 659) at Evergreen Mills Road (VA Route 621)
- Belmont Ridge Road (VA Route 659) at Evergreen Mills Road (VA Route 621)

2.3 Existing Traffic Volumes

Existing traffic volumes were collected in December 2012 (with exceptions noted below). Traffic volume summaries are included in Appendix A. Peak hour turning movement counts (7 – 9 AM and 4 – 6 PM) were conducted at the following intersections:

- John Mosby Highway (US Route 50) at Stone Springs Boulevard (VA Route 2625)
- John Mosby Highway (US Route 50) at Gum Spring Road (VA Route 659)
- John Mosby Highway (US Route 50) at Hutchinson Farm Road – January 2013
- John Mosby Highway (US Route 50) at Pinebrook Road (VA Route 827)
- John Mosby Highway (US Route 50) at Loudoun County Parkway (VA Route 606)
- John Mosby Highway (US Route 50) at South Riding Boulevard (VA Route 2201)
- John Mosby Highway (US Route 50) at Poland Road (VA Route 742) / Tanner Lane
- John Mosby Highway (US Route 50) at Tall Cedars Parkway (VA Route 2200)
- Loudoun County Parkway (VA Route 606) at Tall Cedars Parkway (VA Route 2200)
- Loudoun County Parkway (VA Route 606) at Evergreen Mills Road (VA Route 621)
- Gum Spring Road (VA Route 659) at Evergreen Mills Road (VA Route 621)
- Belmont Ridge Road (VA Route 659) at Evergreen Mills Road (VA Route 621)

Hourly traffic volumes were collected for a 48-hour period in December 2012 (with exceptions noted below) for the following locations (see Appendix A):

- John Mosby Highway (US Route 50) – East of Gum Spring Road (VA Route 659)
- Loudoun County Parkway (VA Route 606) – South of US Route 50
- Loudoun County Parkway (VA Route 606) – North of Evergreen Mills Road (VA Route 621)
- Evergreen Mills Road (VA Route 621) – West of Belmont Ridge Road (VA Route 659)
- Gum Spring Road (VA Route 659) – North of US Route 50
- Belmont Ridge Road (VA Route 659) – North of Evergreen Mills Road (VA Route 621)
- Belmont Ridge Road (VA Route 659) – South of Parkview Drive
- Tall Cedars Parkway (VA Route 2200) – West of Poland Road (VA Route 742) – March 2013

Additional hourly traffic volumes were provided by VDOT for a 48-hour period in February 2011 (with exceptions noted below) for the following locations to assist with traffic forecasting, (see Appendix A):

- John Mosby Highway (US Route 50) – West of Fleetwood Road / Goshen Road (VA Route 616) – March 2011
- John Mosby Highway (US Route 50) – East of Pinebrook Road (VA Route 827) – March 2011
- Loudoun County Parkway (VA Route 606) – North of US Route 50
- Loudoun County Parkway (VA Route 606) – North of Edgewater Street (VA Route 2237)
- Old Ox Road (VA Route 606) – North of Arcola Road (VA Route 842)
- Gum Spring Road (VA Route 659) – South of US Route 50

2.4 Safety Analysis

A crash analysis was conducted in the study area to identify crash trends and how each study area roadway compares to statewide and Northern Virginia District crash rates for similar types of roadways. Detailed crash data for the entire project area for the three year period from January 2009 through December 2011 was provided by VDOT. Table 2-1 summarizes a comparison of crash rates along the study area roadway segments with state and Northern Virginia District crash rates for similar facilities based on 2007 crash data.

There were a total of 435 reported crashes along US Route 50, Loudoun County Parkway / Old Ox Road (VA Route 606), Evergreen Mills Road (VA Route 621), Gum Spring Road / Belmont Ridge Road (VA Route 659), and Tall Cedars Parkway (VA Route 2200) within the study area. Of the total crashes, 146 (34%) involved personal injuries and two (0.5%) were fatalities. Along US Route 50, there were 229 crashes including 76 (33%) personal injury crashes and one fatality. Along VA Route 606, there were 68 crashes including 21 (31%) personal injury crashes. Along VA Route 621, there were 42 crashes including 10 (24%) personal injury crashes. Along Route VA 659, there were 30 crashes including 7 (23%) personal injury crashes and one fatality. Along VA Route 2200, there were 66 crashes including 32 (48%) personal injury crashes.

Roadway Segment Crash Rate Comparison: A comparison to other statewide and Northern Virginia District roadways was performed to determine the relative safety level of each roadway in the study area based on the latest available 2007 VDOT Summary of Crash Data. Crash rates along study area roadway segments were calculated based on the number of crashes within the three-year study period, roadway segment lengths, and the VDOT published ADT values for those segments.

As shown in Table 2-1, the crash rate along US Route 50 is greater than the statewide average crash rate, but less than the Northern Virginia average crash rate. The crash rates for VA Routes 606, 621, 659, and 2200 are generally less than the Northern Virginia average crash rate for Secondary Highways, except for the eastern segment of Tall Cedars Parkway (VA Route 2200) from Riding Center Drive (VA Route 2201) to US Route 50.

Based on this analysis, the roadways within the study area generally experience average to below-average crash rates when compared to Northern Virginia District averages for similar roadways, with the exception of Tall Cedars Parkway (VA Route 2200).

Table 2-1: Roadway Segment Crash Rate Analysis

Roadway	Segment	Facility Type	Crash Rate (crashes per 100 million vehicle-miles traveled)		
			Study Area (2009 – 2011)	Statewide Average (2007)	Northern Virginia District Average (2007)
US Route 50 (John Mosby Highway)	VA Route 616 to VA Route 2200	Rural minor arterial / Urban principal arterial	162	103	168
VA Route 606 (Loudoun County Parkway)	Southern Study Limits to VA Route 621	Local / Urban collector	82	N/A	234
VA Route 606 (Loudoun County Parkway / Old Ox Road)	VA Route 621 to Northern Study Limits	Urban collector	128	N/A	234
VA Route 621 (Evergreen Mills Road)	VA Route 659 to VA Route 606	Urban collector	175	N/A	234
VA Route 659 (Gum Spring Road)	VA Route 2200 to US Route 50	Rural minor collector	228	N/A	234
VA Route 659 (Gum Spring Road)	US Route 50 to VA Route 621	Urban collector	65	N/A	234
VA Route 659 (Belmont Ridge Road)	VA Route 621 to VA Route 772	Urban collector	46	N/A	234
VA Route 2200 (Tall Cedars Parkway)	West End to VA Route 659	Local	60	N/A	234
VA Route 2200 (Tall Cedars Parkway)	VA Route 2201 to US Route 50	Local	238	N/A	234

Chapter 3.0 ALTERNATIVES CONSIDERED

3.1 Alternative 1: No Build

The No Build Alternative serves as a benchmark for comparison to the proposed project alternatives, and would include all planned and programmed transportation improvements in the study area that have been approved and adopted for implementation by 2040, as identified in the most recent *National Capital Region's Financially Constrained Long-Range Plan* (CLRP). Prepared by the National Capital Region Transportation Planning Board (TPB), which is the designated Metropolitan Planning Organization (MPO) for the Washington, DC region under the Metropolitan Washington Council of Governments (MWCOG), the CLRP includes projected transit and traffic, demographics, and air quality conditions through the 2040 horizon year. Projects listed in the CLRP that would affect the proposed project study area are included for consideration under the No Build Alternative. The following is a summary of the planned roadway improvements included in the CLRP:

- Construction of the Loudoun County Parkway (VA Route 606 / VA Route 607) to four lanes from Old Ox Road (VA Route 606) / Arcola Road (VA Route 842) to Ryan Road (VA Route 772);
- Widening of US Route 50 from four to six lanes from Gum Spring Road (VA Route 659) to Sully Road (VA Route 28);
- Completion of the new Bi-County Parkway (VA Route 411), a four-lane limited access facility from Prince William Parkway (VA Route 234) in Prince William County at Interstate 66 in Fairfax County to US Route 50, west of Dulles Airport along the Northstar Boulevard alignment in Loudoun County;
- Widening of Gum Spring Road (VA Route 659) from two lanes to a four-lane divided facility from Braddock Road (VA Route 620) to US Route 50;
- Reconstruction and widening of Old Ox Road (VA Route 606) from two to four lanes from Moran Road (VA Route 634) to Evergreen Mills Road (VA Route 621);
- Construction of an interchange at US Route 50 and Old Ox Road (VA Route 606) / Loudoun County Parkway; and
- Construction of Tall Cedars Parkway (VA Route 2200) to a four-lane divided facility from Gum Spring Road (VA Route 659) to Pinebrook Road (VA Route 827).

3.2 Alternative 2: New Alignment

Alternative 2 consists of a new roadway originating at US Route 50, approximately 2.2 miles west of its existing intersection with the Loudoun County Parkway (Route 606 / VA Route 607), in the location where the Bi-County Parkway (VA Route 411) interchange is planned. Alternative 2 would connect to the proposed interchange allowing for all movements to and from US Route 50 and the proposed Bi-County Parkway (VA Route 411). From US Route 50, the Alternative 2 would follow a new alignment located within the same corridor as Loudoun County's proposed Northstar Boulevard, extending approximately one-mile northeast before turning due east approximately 0.25 mile south of Evergreen Mills Road (VA Route 621). The alignment would continue east for approximately 1.7 miles, with an overpass at Belmont Ridge Road (VA Route 659) and Evergreen Mills Road (VA Route 621) until intersecting with existing Old Ox Road (VA Route 606) / Loudoun County Parkway.

This connection would consist of a full-access interchange with Old Ox Road (VA Route 606), the planned Loudoun County Parkway (VA Route 607) extension, and future airport connector roads. Alternative 2 would be a limited access highway, with no direct access to adjoining properties. Instead, connections with arterial roadways would be provided via US Route 50, Bi-County Parkway, Old Ox Road (VA Route 606), planned extension of Loudoun County Parkway (VA Route 606 / VA Route 607) and the future airport connector roads. Alternative 2 would consist of a four-lane divided principal arterial with a design speed of 60 miles per hour.

3.3 Alternative 3A: US Route 50 Elevated

Alternative 3A would be a four-lane divided limited access principal arterial, on an aerial structure within the median of US Route 50. In order to construct the aerial structure, the existing US Route 50 median would need to be widened, resulting in the at-grade lanes for US Route 50 being shifted outward from the widened median. Upon returning to grade parallel to Loudoun County Parkway (VA Route 606/ VA Route 607), Alternative 3A would continue to be a four-lane divided, limited access principal arterial but at-grade instead of elevated.

Specifically, Alternative 3A would originate at US Route 50 and the planned Bi-County Parkway interchange and provide full connections to Bi-County Parkway (VA Route 411). Proposed Alternative 3A would provide access to US Route 50 westbound and from US Route 50 eastbound only. From the interchange at Bi-County Parkway (VA Route 411), Alternative 3A would follow along the US Route 50 alignment in an elevated section, within the roadway median. At the future interchange with Loudoun County Parkway, the roadway would travel north over the Loudoun County Parkway and return to grade on the east side of Old Ox Road (VA 606) / Loudoun County Parkway, on Dulles Airport property. Alternative 3A would provide a connection to US Route 50 eastbound and from US Route 50 westbound at this future interchange. From there the facility would extend parallel to Old Ox Road (VA Route 606) / Loudoun County Parkway approximately 1.7 miles to the future airport connector roads. Flyover ramps would be provided along this portion of Alternative 3A to provide a connection from northbound Alternative 3A to northbound Loudoun County Parkway and from southbound Loudoun County Parkway to southbound Alternative 3A. A proposed full-access interchange with Old Ox Road (VA Route 606), the planned Loudoun County Parkway (VA Route 607) extension, and future airport connector roads is proposed.

3.4 Alternative 3B: Loudoun County: Countywide Transportation Plan (CTP)

Alternative 3B would originate at the planned full-access interchange of US Route 50 and the Bi-County Parkway (VA Route 411). To meet Loudoun County's CTP (Loudoun County, 2012a) US Route 50 would be widened from four (4) lanes to six (6) lanes plus two (2) auxiliary lanes, from the planned interchange at Bi-County Parkway (VA Route 411) to Gum Spring Road (VA Route 659). At-grade access would be closed along US Route 50 from Bi-County Parkway to Loudoun County Parkway to meet the limited access requirements. Access to properties to the south would be provided from Tall Cedars Parkway. Access to properties to the north would be provided from a parallel frontage road accessed from Gum Spring Road (VA Route 659). The Loudoun County CTP identifies proposed Glascock Boulevard as a parallel facility to the north of US Route 50, but this facility is not currently included in the CLRP and therefore not included in this study. Should this Glascock Boulevard be constructed prior to 2025, this facility could function in place of the proposed frontage road; however, in Alternative 3B a separate frontage road is assumed within the proposed corridor along US Route 50. A full access interchange at Gum Spring Road (VA Route 659) and US Route 50

would also be provided, in order to conform to the long term transportation plan found in Loudoun County's CTP.

A full access interchange would be provided at Old Ox Road (VA 606) / Loudoun County Parkway and US Route 50 where Alternative 3B would follow Old Ox Road (VA Route 606) / Loudoun County Parkway to the north. Under Alternative 3B, Old Ox Road (VA Route 606) / Loudoun County Parkway would be upgraded to an eight (8) lane limited access facility to match the Loudoun County CTP designation of the facility as a freeway. The Loudoun County CTP shows at-grade intersections at proposed Glascock Boulevard, Evergreen Mills Rd (VA Route 621) and Arcola Boulevard (VA Route 842) with the proposed freeway facility. However, at grade intersections are generally not allowed within a limited access freeway. Therefore, Alternative 3B assumes a frontage road will be provided within the proposed corridor along Old Ox Road (VA Route 606) / Loudoun County Parkway in the southbound direction to provide limited access to and from Evergreen Mills Road (VA Route 621). The frontage road is anticipated to be for the southbound direction only. Alternative 3B would terminate at a full-access interchange with Old Ox Road (VA Route 606), the planned Loudoun County Parkway (VA Route 607) extension, and future airport connector roads. This proposed alternative would be a six (6) lane limited access facility plus two (2) auxiliary lanes along US Route 50 and an eight (8) lane limited access highway along Old Ox Road (VA Route 606) / Loudoun County Parkway, with design speeds of 60 miles per hour.

3.5 Alternative 3C: US Route 50 Limited Access and Loudoun County Parkway At-Grade

In order to address suggestions to provide access to Dulles Airport by a southern entrance point at the planned interchange of US Route 50 and Loudoun County Parkway, Alternative 3C (**Figure 2-11**) has been incorporated for study in this Revised EA. Alternative 3C would originate at the planned full-access interchange of US Route 50 and the planned Northstar Boulevard (VA Route 411) / Bi-County Parkway and extend along US Route 50 to an interchange at Old Ox Road (VA Route 606) / Loudoun County Parkway / Dulles Airport property. At the eastern terminus, airport access would be provided into the southwest corner of Dulles Airport. The ramps between Alternative 3C and Dulles Airport would connect to the future perimeter road on MWAA property. According to MWAA, the future perimeter roads at Dulles Airport will ultimately allow traffic to reach planned expansion areas as well as the Main Terminal area. MWAA has confirmed that their ALP would be updated to reflect this link to the public roadway network.

Under Alternative 3C, access to and from the airport would be provided from both directions of US Route 50 and both directions of VA Route 606 / Loudoun County Parkway. Along US Route 50, Alternative 3C would consist of six through lanes (three in each direction), three interchanges along US Route 50 at Northstar Boulevard (VA Route 411) / Bi-County Parkway, Gum Springs Road, and Old Ox Road (VA Route 606) / Loudoun County Parkway, two auxiliary lanes (one in each direction connecting the ramps of the interchanges), and two dedicated lanes, separated by a concrete median, for traffic in and out of Dulles Airport (one in each direction). VA Route 606 would be widened to six lanes between its interchange with US Route 50 and where the Dulles Loop widening is expected to terminate. A frontage road would be included on the north side of US Route 50 in order to maintain access for residents and businesses along this corridor.

Chapter 4.0 TRAFFIC FORECASTING The travel demand forecasts for this study were developed using the TPB Travel Forecasting Model, Version 2.3.39 with COG Round 8.1 Cooperative Forecasts. The model was built for a base year of 2012, an opening year of 2025 and a design year 2040. The calibration was performed by taking into account the modeling efforts of the Bi-County Parkway Extension Study and all efforts were made to maintain consistent modeling assumptions. Forecasting data, including forecasted average daily traffic volumes (ADTs) and turning movements, are provided in Appendix B.

4.1 Base Year Calibration and Validation

The model study area extends from Ryan Road (VA Route 772) to the north, Braddock Road (VA Route 620) to the south, Fleetwood Road / Goshen Road (VA Route 616) to the west, and Old Ox Road (VA Route 606) and Dulles Airport to the east. Minor adjustments were made to the base year network, including the extension of Tall Cedars Parkway (VA Route 2200) to US Route 50, the addition of South Riding Boulevard (between Tall Cedars Parkway and US Route 50) and minor centroid connector changes in the vicinity of the roadway changes.

The original model validation was reviewed for reasonableness by comparing volume to count ratios for the base year along all major roadways within the study area (see Table 4-1). After network adjustments were made, base year model runs were performed to compare calibration results. The calibration process was repeated by making minor adjustments to the network as described above, until reasonable volume to count ratios were achieved.

Table 4-1: Model Validation – Volume to Count Ratios by Facility (2012)

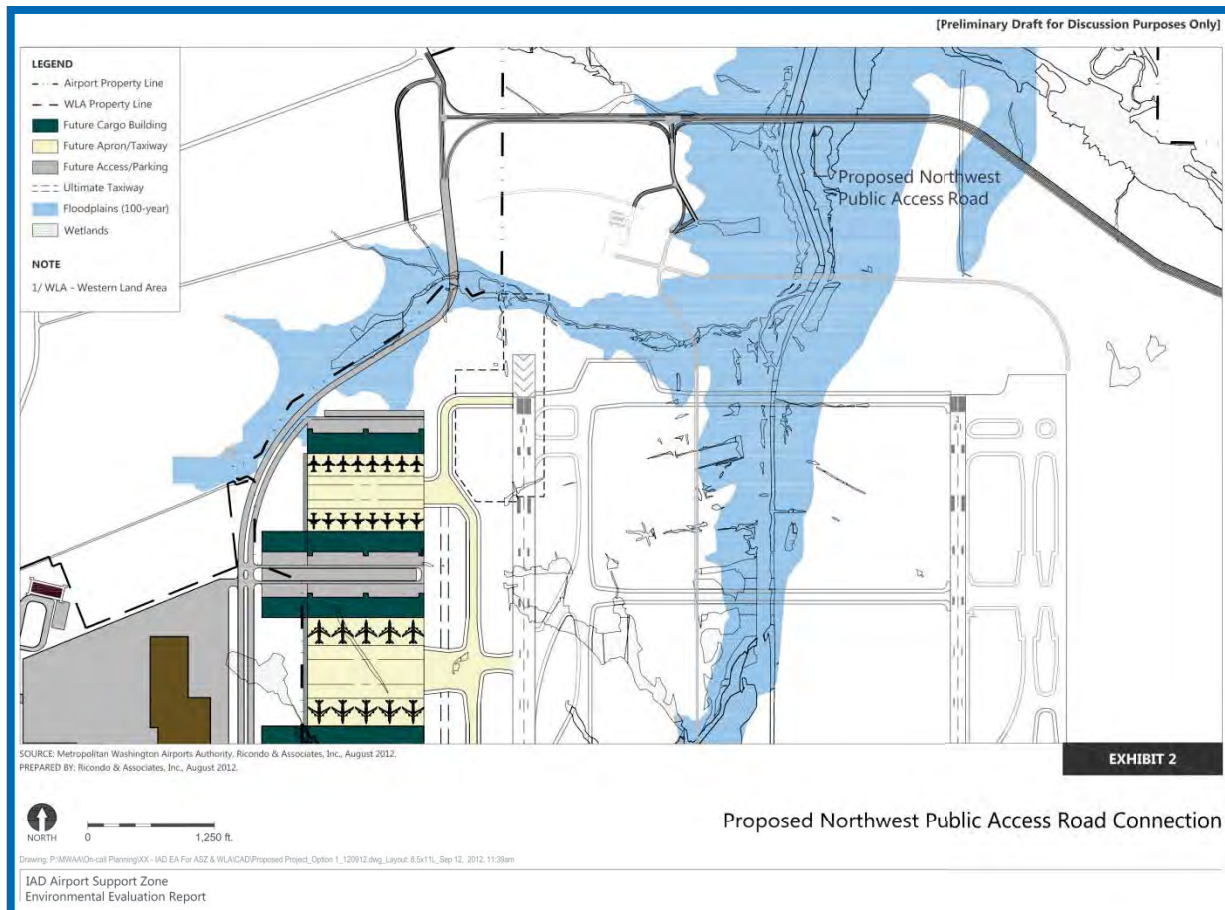
Segment #	Roadway	Segment		2012 ADT (Count)	Original Bi-County Parkway Model		Calibrated DACPMAH Model	
		From	To		Model Volume	Volume / Count Ratio	Model Volume	Volume / Count Ratio
1	US Route 50 (John Mosby Highway)	Watson Road	Fleetwood Road	16300	19500	1.20	21500	1.32
2		Fleetwood Road	Gum Spring Road	--*	--	--	--	--
3		Gum Spring Road	Loudoun County Parkway	30900	31700	1.03	37000	1.20
4		Loudoun County Parkway	Poland Road	35900	40100	1.12	36300	1.01
5		Poland Road	Pleasant Valley Road	--*	--	--	--	--
		US Route 50 (Total)			91300	1.10	94800	1.14
6	VA Route 659 (Belmont Ridge Road)	North of Ryan Road	Ryan Road	13900	11500	0.83	12400	0.89
7		Ryan Road	Creighton Road	16700	13200	0.79	16000	0.96
8		Creighton Road	Evergreen Mills Road	14100	16900	1.20	19000	1.35
9		Evergreen Mills Road	Gum Spring Road	20300	16100	0.79	18600	0.92
10		Gum Spring Road	US Route 50	9000	6100	0.68	8100	0.90
11		US Route 50	Braddock Road	17200	13200	0.77	14400	0.84
12		Braddock Road	South of Braddock	--*	7800	--	9100	--
		Belmont Ridge Road (Total)			77000	0.84	88500	0.97
13	VA Route 606 / 607 (Loudoun County Parkway)	Bear Schools Road	Evergreen Mills Road	21500	8700	0.40	10200	0.47
14		Evergreen Mills Road	US Route 50	30600	16600	0.54	18800	0.61
15		US Route 50	Tall Cedars Parkway	13300	14700	1.11	14500	1.09
16		Tall Cedars Parkway	Braddock Road	12400	2800	0.23	5200	0.42
		Loudoun County Parkway (Total)			42800	0.55	48700	0.63
17	VA Route 620 (Braddock Road)	Lightridge Farm Road	Gum Spring Road	2200	--	--	--	--
18		Gum Spring Road	Loudoun County Parkway	--*	6500	--	11050	--
19		Loudoun County Parkway	Pleasant Valley Road	7300	8200	1.12	6600	0.90
		Braddock Road (Total)			7300	1.12	6600	0.90
20	VA Route 621 (Evergreen Mills Road)	North of Ryan Road	Ryan Road	--*	6200	--	7800	--
21		Ryan Road	Fleetwood Road	7100	3900	0.55	4900	0.69
22		Fleetwood Road	Belmont Ridge Road	6900	3900	0.57	4900	0.71
		Evergreen Mills Road (Total)			7800	0.56	9800	0.70

* Data unavailable

4.2 MWAA Western Lands

The Metropolitan Washington Airports Authority (MWAA) Western Lands Mixed Use and Cargo expansion (see Figure 4-1) was identified as a significant development to be incorporated into the future modeling efforts. The 6 million square foot Dulles Airport expansion, including a new cargo terminal, a hotel/conference center and mixed-use development including office/retail/industrial land uses, is located completely within zone # 2387 of the MWCOG model.

Figure 4-1: Western Lands Expansion



Source: IAD Airport Support Zone, Environmental Evaluation Report, August 2012

The development consists of two access points (see Figure 4-1), a northern entrance at Old Ox Road (VA Route 606) and a southern entrance from Loudoun County Parkway (VA Route 606 / VA Route 607), which will connect to the proposed DACPMH. A proposed “Northwest Public Access Road” will connect this development to the current Dulles passenger terminal through existing Autopilot Drive. This internal roadway was coded as a collector (FT-4) and is proposed to be two lanes in 2020 and four lanes in 2040. Trip generation numbers provided by MWAA suggest that approximately 20% of all trips into the development will be truck trips.

4.3 Future Year Model No Build Network

All CLRP projects within the study area along with the approved MWAA Western Lands development were added to the future year no build networks as shown in Figure 4-2. As discussed in Section 3.1, the following is a summary of the planned roadway improvements included in the CLRP:

- Construction of the Loudoun County Parkway (VA Route 606 / VA Route 607) to four lanes from Old Ox Road (VA Route 606) / Arcola Road (VA Route 842) to Ryan Road (VA Route 772);
- Widening of US Route 50 from four to six lanes from Gum Spring Road (VA Route 659) to Sully Road (VA Route 28);
- Completion of the new Bi-County Parkway (VA Route 411), a four-lane limited access facility from Prince William Parkway (VA Route 234) to US Route 50, west of Dulles Airport;
- Widening of Gum Spring Road (VA Route 659) from two lanes to a four lane divided facility from Braddock Road (VA Route 620) to US Route 50;
- Reconstruction and widening of Old Ox Road (VA Route 606) from two to four lanes from Moran Road (VA Route 634) to Evergreen Mills Road (VA Route 621);
- Construction of an interchange at US Route 50 and Old Ox Road (VA Route 606) / Loudoun County Parkway; and
- Construction of Tall Cedars Parkway (VA Route 2200) to a four-lane divided facility from Gum Spring Road (VA Route 659) to Pinebrook Road (VA Route 827).

Figure 4-2: Future (2040) No Build Network



4.4 Future Year Growth and Demographics

MWCOG Round 8.1 Cooperative Forecasts were used in the Version 2.3, Build 39 TPB Travel Forecasting model. These demographics were summarized for the study area TAZs (see Table 4-2).

Substantial growth was observed between 2012 and 2025, with a flattening of growth between 2025 and 2040. Households in the study area TAZs are observed to increase by 90% along with a population growth of 81% in the 28-year period. This translates to an annual growth of 2.3% in households and 2.1% growth in population. Employment growth was observed to be 138%, which is an annual growth of 3.1%.

4.5 ADT and TMC Methodology

The future year forecast ADTs from the model were post-processed based on: (1) growth observed in the model between the base year and future year alternatives; (2) NCHRP 255-based forecasting techniques; and (3) reliance on model volumes at new facilities that do not exist in the base year.

The daily truck percentages in the study area were derived from a combination of (1) model truck percents and (2) trucks from MWAA's new Dulles Access Cargo facility. Based on discussions with MWAA and Western Lands trip generation provided, it was assumed that approximately 20% of all trips into the new development would be cargo-related trucks. These cargo trucks were further distributed along roadways adjacent to the Dulles interchange based on travel patterns observed from the model. The roadways include the new DACPMAH highway, Loudoun County Parkway, Bi-County Parkway, US Route 50, and Old Ox Road. On these segments, model truck percents were adjusted by adding the cargo facility trucks. Unadjusted truck percents from the model were used on all other study area roadways.

AM and PM peak hour turning movement forecasts at the study intersections were calculated based on the NCHRP 255 based average rates methodology. This process grows existing turning movements from growth observed between base year and forecast year approach volumes.

AM and PM peak hour volumes at the interchanges were calculated using model-forecasted ADTs and historic K and D-factors along US Route 50 and Loudoun County Parkway (VA Route 606 / VA Route 607). K-factors ranging between 8 and 10% were applied to the ADTs to calculate AM and PM peak hour volumes.

After the turning movement forecasting was completed, volumes were balanced between the intersections/interchanges by making adjustments so that: (1) total volume entering each intersection matched the total volume exiting the upstream intersection; and (2) total volume exiting each intersection matched the total volume entering the downstream intersection. Traffic forecasting data, including forecast ADTs and turning movements, is provided in Appendix B.

Table 4-2: Study Area Demographics

TAZ		Households			Population			Employment		
		2012	2025	2040	2012	2025	2040	2012	2025	2040
Dulles Airport	1677	0	0	0	0	0	0	162	238	294
	1680	0	0	0	0	0	0	54	67	77
	2387	0	0	0	0	0	0	1,717	5,761	10,164
	2388	0	0	0	0	0	0	13,385	18,679	21,934
	Total	0	0	0	0	0	0	15,318	24,745	32,469
North of US Route 50	2317	393	393	393	1,509	1,509	1,509	78	78	78
	2318	252	259	259	1,006	1,032	1,032	715	2,349	3,227
	2319	1,031	1,031	1,031	2,812	2,812	2,812	141	141	141
	2320	0	0	0	0	0	0	2,616	2,616	2,616
	2407	19	52	53	49	171	175	23	25	223
	2408	299	1,362	1,672	880	3,853	4,437	291	904	1,270
	2409	48	275	567	173	899	1,451	748	3,352	4,228
	2410	208	1,044	1,110	561	2,543	2,668	442	2,942	3,655
	2411	29	282	373	84	690	860	808	3,035	3,036
	2412	43	358	534	106	796	1,129	34	248	311
	2413	318	2,071	2,501	1,068	6,140	6,952	97	220	242
	2414	1,140	1,172	1,172	4,241	4,333	4,333	264	266	266
	2415	883	1,229	1,229	2,816	3,831	3,831	639	1,770	1,770
	2416	187	987	987	591	3,149	3,149	19	84	428
	2417	253	1,548	1,548	834	5,277	5,277	48	241	529
	2422	186	1,151	1,234	602	4,192	4,502	46	114	287
	2423	67	167	276	198	570	974	194	203	208
	Total	5,356	13,381	14,939	17,530	41,797	45,091	7,203	18,588	22,515
South of US Route 50	2402	401	781	815	1,405	2,816	2,944	120	146	147
	2403	42	214	214	138	777	777	148	174	174
	2404	94	527	554	309	1,921	2,023	74	353	354
	2405	2,081	3,216	3,216	6,663	10,156	10,156	432	592	592
	2406	719	1,523	1,523	1,771	3,572	3,572	756	1,837	1,899
	2389	681	907	907	1,776	2,263	2,263	418	620	862
	2391	53	259	259	153	746	746	781	1,668	1,812
	2392	977	1,788	1,977	3,551	5,774	6,168	181	762	1,446
	2393	1,908	2,085	2,085	5,927	6,537	6,537	623	634	634
	2394	369	564	564	1,096	1,656	1,656	939	2,050	2,647
	2395	841	1,299	1,299	2,579	4,041	4,041	226	253	253
	2396	1,508	1,549	1,549	5,228	5,364	5,364	577	615	615
	2399	1,477	1,480	1,480	5,113	5,125	5,125	293	293	293
	Total	11,151	16,192	16,442	35,709	50,748	51,372	5,568	9,997	11,728
Total		16,507	29,573	31,381	53,239	92,545	96,463	28,089	53,330	66,712
Growth			79%	90%		74%	81%		90%	138%
Annual Growth				2.3%			2.1%			3.1%

4.6 Future Alternatives Modeling Results

The five alternatives under consideration (including the No Build alternative) were modeled for future conditions as shown in Figure 4-3. The 2040 ADTs and number of travel lanes assumed for each roadway segment are tabulated in Table 4-3. The following is a summary of key findings of the model results:

Alternative 1 (No Build)

- Loudoun County Parkway (VA Route 606 / VA Route 607) volumes increase by 100 to 140% north of US Route 50 and by 40% south of US Route 50
- US Route 50 volumes increase by 50 to 130% west of Loudoun County Parkway and by 55% east of Loudoun County Parkway

Alternative 2

- 6,000 to 13,000 vehicles per day (vpd) are shifted onto the limited access facility from US Route 50
- 5,000 to 11,000 vpd are shifted onto the limited access facility from Loudoun County Parkway
- The new alignment limited access facility carries about 35,000 vpd

Alternative 3A

- 4,000 to 12,000 vpd are shifted from US Route 50 onto the limited access facility (i.e., elevated structure over US Route 50)
- 22,000 vehicles are shifted from Loudoun County Parkway to the limited access roadway parallel to Loudoun County Parkway
- US Route 50/Loudoun County Parkway elevated structure/parallel roadway carries 14,000 to 35,000 vpd

Alternative 3B

- US Route 50 volumes increase by 12,000 to 15,000 vehicles per day (vpd)
- Loudoun County Parkway volumes increase by 11,000 to 20,000 vpd

Alternative 3C

- US Route 50 volumes increase by 3,500 to 10,500 vehicles per day (vpd)
- Loudoun County Parkway volumes increase by 6,000 to 8,500 vpd
- The dedicated lanes in the median of US Route 50 to and from the Dulles Interchange entrance will carry 11,200 vpd

With Alternatives 2, 3A, 3B, and 3C, model volumes to and from the Western Lands (from the Dulles Interchange entrance) range from 13,000 to 19,000.

Figure 4-3: Model Network for Alternatives 1, 2, 3A, 3B and 3C

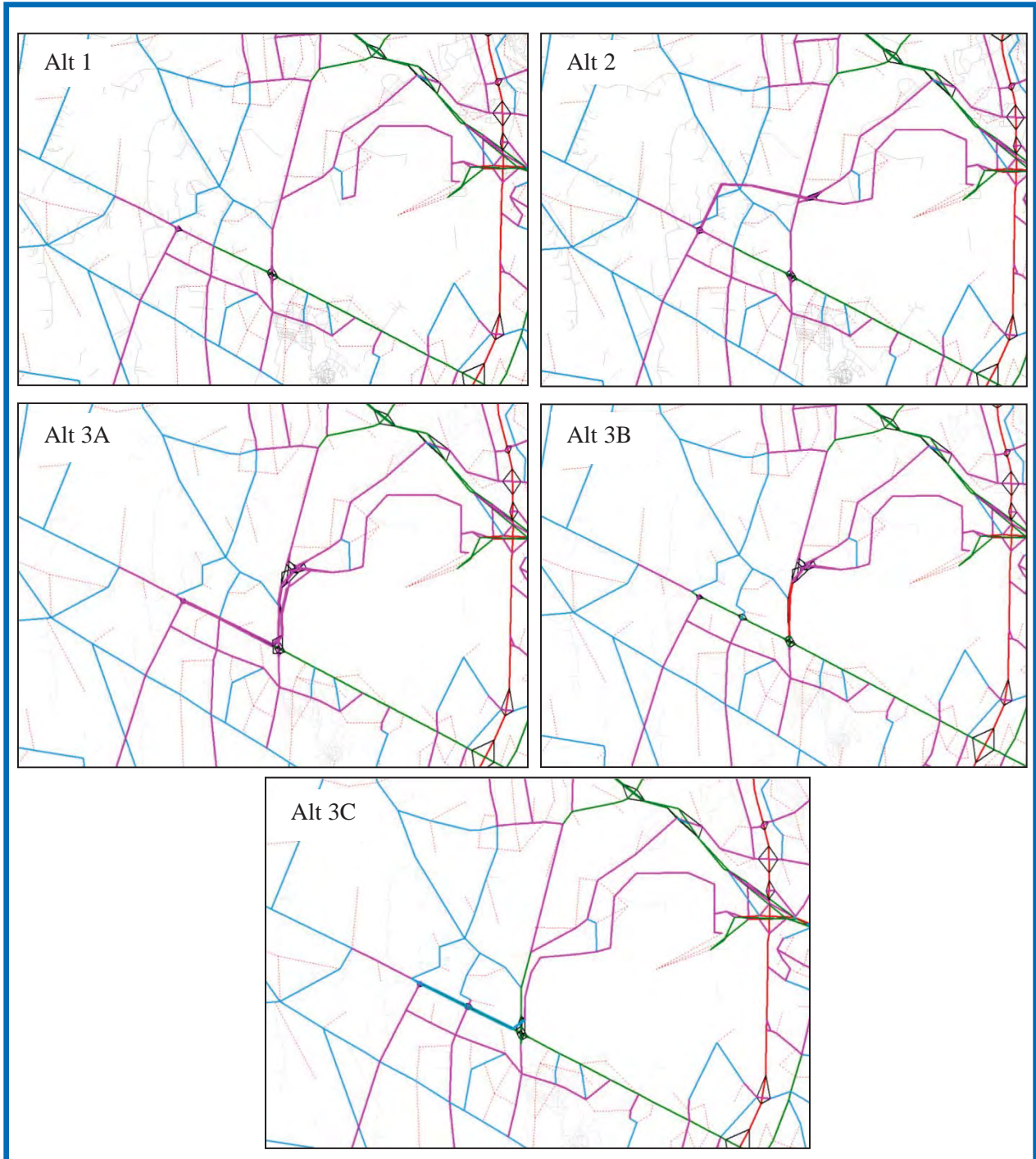


Table 4-3: Model Alternatives – ADT and Number of Lanes

Roadway	Link		Existing (2012)		2040 Alt. 1 (No Build)		2040 Alt. 2 (New Alignment)		2040 Alt. 3A (Route 50 Elevated)		2040 Alt. 3B (Loudoun County CTP)		2040 Alt. 3C (Route 50 Limited Access and Loudoun County Pkwy. At- Grade)	
			# Lanes	ADT	# Lanes	ADT	# Lanes	ADT	# Lanes	ADT	# Lanes (Auxiliary Lanes)	ADT	# Lanes (Auxiliary Lanes)	ADT
US Route 50	West of Northstar Blvd	Northstar Blvd	4	16,500	4	24,800	4	33,000	4	25,100	4 (2)	25,300	4 (2)	25,300
	Northstar Blvd	Gum Spring Road	4	16,500	4	38,000	4	32,200	4	34,800	6 (2)	53,500	6 (2)	48,500
	Gum Spring Road	Loudoun County Pkwy	4	31,000	6	59,000	6	45,900	6	47,700	6 (2)	71,000	6 (2)	62,600
	Loudoun County Pkwy	South Riding Blvd	6	36,000	6	54,900	6	54,600	6	55,200	6	58,000	6	58,000
Elevated US Route 50 (Alt. 3A) / US Route 50 in median (Alt. 3C)	Northstar Blvd	Gum Spring Road	--	--	--	--	--	--	4	29,600	--	--	2	11,200
	Gum Spring Road	Loudoun County Pkwy	--	--	--	--	--	--	4	29,600	--	--	2	11,200
New Alignment Road (Alt. 2)	US Route 50	Loudoun County Pkwy / Old Ox Rd / MWAA Interchange	--	--	--	--	4	34,700	--	--	--	--	--	--
MWAA Western Lands Expansion Aviation Support Roadway	Loudoun County Pkwy / MWAA Interchange	Dulles Airport	--	--	--	--	4	14,100	4	18,500	4	12,900	4	16,700
Loudoun County Parkway	Tall Cedars Pkwy	US Route 50	4	13,500	4	18,100	4	18,100	4	18,200	4	21,600	4	20,500
	US Route 50	Evergreen Mills Road	4	30,500	4	61,500	4	56,900	4	37,900	8	73,900	6	63,900
	Evergreen Mills Road	Loudoun County Parkway / Old Ox Road	2	21,500	4	51,000	4	40,100	4	52,100	8	71,500	6	57,400
	Loudoun County Pkwy / Old Ox Rd	Creighton Road	2	--	4	30,500	4	34,300	4	36,000	4	39,000	4	39,000
Dulles Connector (Parallel to Loudoun County Pkwy)	US Route 50	Evergreen Mills Road	--	--	--	--	--	--	4	34,700	--	--	--	--
Old Ox Road	Loudoun County Pkwy / Old Ox Rd	Carters School Road	2	21,500	4	32,300	4	39,200	4	33,400	4	38,800	4	33,100
Northstar Boulevard	Tall Cedars Pkwy	US Route 50	--	--	4	29,500	4	37,800	4	36,300	4	35,600	4	37,100
Gum Spring Road	South of US Route 50	US Route 50	4	17,000	4	27,300	4	26,800	4	27,200	4	34,100	4	36,400
Evergreen Mills Road	US Route 50	Evergreen Mills Road	2	9,000	2	19,000	2	17,200	2	16,700	2	17,000	2	14,100
	Belmont Ridge Road	Gum Spring Road	2	20,500	2	23,800	2	23,800	2	23,800	2	23,800	2	23,800
	Gum Spring Road	Loudoun County Pkwy	2	13,000	2	15,600	2	16,300	2	16,800	2	15,100	2	18,300
Tall Cedars Parkway	Loudoun County Pkwy	East of Loudoun County Pkwy	4	9,000	4	23,300	4	16,900	4	22,650	4	22,350	4	22,100
	Gum Spring Road	Loudoun County Pkwy	--	--	4	15,300	4	12,300	4	12,900	4	15,200	4	13,600
	Northstar Blvd	Gum Spring Road	--	--	4	11,200	4	4,700	4	5,300	4	11,100	4	9,800

4.7 Environmental Traffic Data

Traffic data required to support the associated noise studies for the project was developed using the Environmental Traffic Data (ENTRADA) program, a spreadsheet-based tool developed by VDOT Transportation Planning. ENTRADA standardizes the production of planning-level traffic data for environmental analysis, including diurnal distribution of traffic volumes, hourly classification data and operating speeds. It utilizes the methodologies of the *Highway Capacity Manual* (HCM) and several other nationally and internationally recognized sources as well as local factors to adjust capacities and free-flow speeds for various facility types.

Input data required for ENTRADA includes base year (2012) and design year (2040) average daily traffic (ADT) volumes, hourly distribution of traffic volumes, directional distribution of traffic, and proportion of medium trucks and heavy trucks. Other inputs include number of lanes per direction, route type, median type, lateral clearance, lane width, access point density, posted speeds, and number of traffic signals. Based on count data collected for the project and VDOT-supplied traffic data, the ADT, hourly distribution of truck data (medium and heavy), and hourly distribution of ADT was entered into ENTRADA. Field visits were conducted to obtain all other required ENTRADA inputs.

To ensure that ENTRADA produced reasonable results, hourly speed distribution outputs for the base year (2012) were compared to available field-collected speed data to determine the appropriate calibration parameter values. Each ENTRADA segment was calibrated to produce accurate results. Where speed data was not available to calibrate certain roadway segments, the calibration parameters from adjacent segments were utilized.

In addition, peak hour volumes and level of service (LOS) for intersections were also compiled from the operational analysis and provided for use as part of the air studies.

Chapter 5.0 TRAFFIC OPERATIONS ANALYSIS

5.1 Methodology and Assumptions

Signalized Intersections: Capacity analysis using Synchro Version 8, Build 803 was performed at signalized intersections within the study area for existing (2012) and no-build (2040) conditions. Intersection geometry and traffic control device configurations were identified based on field visits. Signal timing data was provided by VDOT and field-verified. The existing traffic signal cycle lengths and timings were not modified; however, for the future (2040) conditions, traffic signal cycle lengths were increased, signal splits were adjusted, and network offsets were optimized as it can be reasonably anticipated that signal timings will be adjusted in the future to accommodate varying travel demands. Intersection level of service (LOS) outputs were obtained from Synchro using the HCM 2000 Signals report, which follows the procedures outlined in the *Highway Capacity Manual* (HCM). Table 5-1 defines LOS A through F for signalized intersections.

Table 5-1: Intersection LOS Descriptions

LOS	Description	Congestion Level
A	Progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.	Low
B	Good progression with short cycle lengths. Some vehicle stoppage may occur, causing slightly higher levels of delay.	Low
C	Higher delays resulting from fair progression, longer cycle lengths, or both. Individual cycle failure may begin to occur at this level, resulting in some overflow. The number of vehicles stopping is significant at this level, but many still pass through the intersection without stopping.	Moderate
D	Longer delays may result from some combination of unfavorable progression, long cycle lengths, and lane flow rates conflicting with signal timing. Individual cycle failures are noticeable at this level.	Moderate
E	High delay level indicative of poor progression, long cycle lengths, and high ratios of conflicts between lane flow rates and signal timing. Individual cycle failures are frequent.	Severe
F	Arrival flow rates exceed the capacity of lane groups and conflicting signal timing. Evidenced by poor progression and long cycle lengths with many individual cycle failures. Considered to be unacceptable by most motorists.	Severe

Source: *Highway Capacity Manual*, Transportation Research Board, 2000, pp. 10-15-17

Roadway Segments: Existing (2012) conditions and all future (2040) alternatives were analyzed using ENTRADA to calculate a LOS for each roadway segment within the study area. ENTRADA is based on HCM methodologies as described in Section 4-7. The speed output from ENTRADA was converted to a LOS based on HCM methodologies. Table 5-2 defines LOS A through F for roadway segments.

Urban Streets: All roadway segments with signalized intersections spaced at less than 2 miles were considered urban street facilities consistent with the 2010 HCM Chapter 16, Urban Street Facilities and Chapter 17, Urban Street Segments. Both directions of travel were evaluated for each urban street facility segment within the study area. The LOS for an urban street facility may be defined for both automobile

and nonautomobile (i.e., pedestrian, bicycle, and transit) modes; however, for the purposes of this study, only the automobile mode was analyzed. For the urban street automobile analysis, travel speed as a percentage of base free-flow speed (%) is the measure used to determine LOS. The travel speed for each roadway segment was obtained from ENTRADA. Field-collected data, where available, was used to define the base free-flow speed. For roadway segments where field data was not available, the base free-flow speed from ENTRADA was used.

Freeway Segments: LOS for freeways within the study area was derived based on density (passenger car per mile per lane (pc/hr/ln)). The freeway density was calculated by obtaining the speed (mph) and volume (vehicles per hour) outputs from ENTRADA, converting the vehicles per hour to a flow rate (pc/hr/ln) using Equation 11-2 from the 2010 HCM, and then dividing this by the speed from ENTRADA to produce a density (pc/mi/ln).

Table 5-2: Roadway Segment LOS Descriptions

LOS	Description	Congestion Level
A	Free traffic flow with low volumes and high speeds. Speeds controlled by driver desires, speed limits, and physical roadway conditions. Vehicles almost completely unimpeded in their ability to maneuver within the traffic stream.	Low
B	Stable traffic flow, with operating speeds remaining near free flow. Drivers still have reasonable freedom to maneuver with only slight restrictions within the traffic stream.	Low
C	Stable flow, but with higher volumes, more closely controlled speed and maneuverability that is noticeably restricted.	Moderate
D	Approaching unstable flow with tolerable operating speeds maintained, but considerably effected by changes in operating conditions. Freedom to maneuver within the traffic stream is more noticeably limited.	Moderate
E	Unstable flow with low speed and momentary stoppages. Operations are at capacity with no usable gaps within the traffic stream.	Severe
F	Forced flow with low speed. Traffic volumes exceed capacity and stoppages for long periods are possible.	Severe

Source: *Highway Capacity Manual*, Transportation Research Board, 2010.

5.2 Existing Conditions

Traffic operations analyses were performed using Synchro and ENTRADA as described in Section 5.1. The HCM Signals reports and ENTRADA are included in Appendix C. Tables 5-3 and 5-5 and Figure 5-1 summarize existing LOS within the study area. Under existing conditions, three of the twelve signalized study intersections operate at LOS F in the AM peak hour, while five intersections operate at LOS D or E in the AM peak hour. Two of the twelve signalized study intersections operate at a LOS F in the PM peak hour, while two intersections operate at LOS D. Despite the fact that some individual intersections operate at LOS E or F, almost all individual roadway segments operate at LOS C or better in existing conditions. The exceptions to this are Loudoun County Parkway north of Evergreen Mills Road and Old Ox Road north of Arcola Road, which operate at LOS D. Also, Evergreen Mills Road between Belmont Ridge Road and Gum Spring Road operates at LOS F.

Table 5-3: Existing (2012) LOS at Intersections

Intersection	Level of Service	
	Existing (2012)	
	AM	PM
US Route 50 at Stone Springs Boulevard	B	B
US Route 50 at Gum Spring Road	F	F
US Route 50 at Hutchinson Farm Drive	E	C
US Route 50 at Pinebrook Road	D	C
US Route 50 at Loudoun County Parkway	D	D
US Route 50 at South Riding Boulevard	A	A
US Route 50 at Poland Road/Tanner Lane	C	C
US Route 50 at Tall Cedars Parkway	E	C
Loudoun County Parkway at Evergreen Mills Road	D	C
Loudoun County Parkway at Tall Cedars Parkway	C	C
Evergreen Mills Road at Belmont Ridge Road/Briarfield Lane	F	F
Evergreen Mills Road at Gum Spring Road	F	D



5.3 Alternative 1 (No Build)

Traffic operations analyses were completed using Synchro and ENTRADA as described in Section 5.1. The HCM Signals reports and ENTRADA are included in Appendix C. Tables 5-4 and 5-5 and Figure 5-2 summarize LOS for 2040 No Build conditions within the study area. As shown, five of the twelve signalized study intersections are projected to operate at LOS F in the AM peak hour, while five intersections are projected to operate at LOS D or E in the AM peak hour. Nine of the twelve signalized intersections are projected to operate at a LOS F in the PM peak hour, while three intersections are projected to operate at LOS D or E. Also, many roadway segments are projected to operate at LOS D or worse. US Route 50 is projected to operate at LOS D from the interchange with Northstar Boulevard to Gum Spring Road and LOS F from Gum Spring Road to Loudoun County Parkway. Gum Spring Road is projected to operate at LOS D south of US Route 50 and LOS F north of US Route 50. Loudoun County Parkway is projected to operate at LOS F north of US Route 50 to Old Ox Road. Evergreen Mills Road and Old Ox Road are projected to operate at LOS F within the study area. In Alternative 1, the CLRP improvements are included, which assumes interchanges at US Route 50 and Bi-County Parkway (i.e., Northstar Boulevard) and US Route 50 at Loudoun County Parkway. Also, US Route 50 is assumed to be six lanes east of Gum Spring Road, and both Loudoun County Parkway and Old Ox Road are assumed to be four-lane facilities.

Table 5-4: Alternative 1 (No Build) LOS at Intersections

Intersection	Level of Service	
	Future (2040)	
	AM	PM
US Route 50 at Stone Springs Boulevard	C	E
US Route 50 at Gum Spring Road	E ¹	F ¹
US Route 50 at Hutchinson Farm Drive	E ¹	F ¹
US Route 50 at Pinebrook Road	E ¹	F ¹
US Route 50 at Loudoun County Parkway	-- ²	-- ²
US Route 50 at South Riding Boulevard	B	D
US Route 50 at Poland Road/Tanner Lane	D	F
US Route 50 at Tall Cedars Parkway	E	D
Loudoun County Parkway at Evergreen Mills Road	F	F
Loudoun County Parkway at Tall Cedars Parkway	F	F
Loudoun County Parkway at Old Ox Road (Route 606)	F	F
Evergreen Mills Road at Belmont Ridge Road/Briarfield Lane	F	F
Evergreen Mills Road at Gum Spring Road	F	F

¹ Assumes future improvements per the CLRP including widening US Route 50 and associated turn lane improvements

² Assumes US Route 50 at Loudoun County Parkway is an interchange in the future per the CLRP

Table 4-2: Study Area Demographics

TAZ		Households			Population			Employment		
		2012	2025	2040	2012	2025	2040	2012	2025	2040
Dulles Airport	1677	0	0	0	0	0	0	162	238	294
	1680	0	0	0	0	0	0	54	67	77
	2387	0	0	0	0	0	0	1,717	5,761	10,164
	2388	0	0	0	0	0	0	13,385	18,679	21,934
	Total	0	0	0	0	0	0	15,318	24,745	32,469
North of US Route 50	2317	393	393	393	1,509	1,509	1,509	78	78	78
	2318	252	259	259	1,006	1,032	1,032	715	2,349	3,227
	2319	1,031	1,031	1,031	2,812	2,812	2,812	141	141	141
	2320	0	0	0	0	0	0	2,616	2,616	2,616
	2407	19	52	53	49	171	175	23	25	223
	2408	299	1,362	1,672	880	3,853	4,437	291	904	1,270
	2409	48	275	567	173	899	1,451	748	3,352	4,228
	2410	208	1,044	1,110	561	2,543	2,668	442	2,942	3,655
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South of US Route 50	2402	401	781	815	1,405	2,816	2,944	120	146	147
	2403	42	214	214	138	777	777	148	174	174
	2404	94	527	554	309	1,921	2,023	74	353	354
	2405	2,081	3,216	3,216	6,663	10,156	10,156	432	592	592
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	2394	369	564	564	1,096	1,656	1,656	939	2,050	2,647
	2395	841	1,299	1,299	2,579	4,041	4,041	226	253	253
	2396	1,508	1,549	1,549	5,228	5,364	5,364	577	615	615
	2399	1,477	1,480	1,480	5,113	5,125	5,125	293	293	293
	Total	11,151	16,192	16,442	35,709	50,748	51,372	5,568	9,997	11,728
Total		16,507	29,573	31,381	53,239	92,545	96,463	28,089	53,330	66,712
Growth			79%	90%		74%	81%		90%	138%
Annual Growth				2.3%			2.1%			3.1%

5.4 Build Alternatives

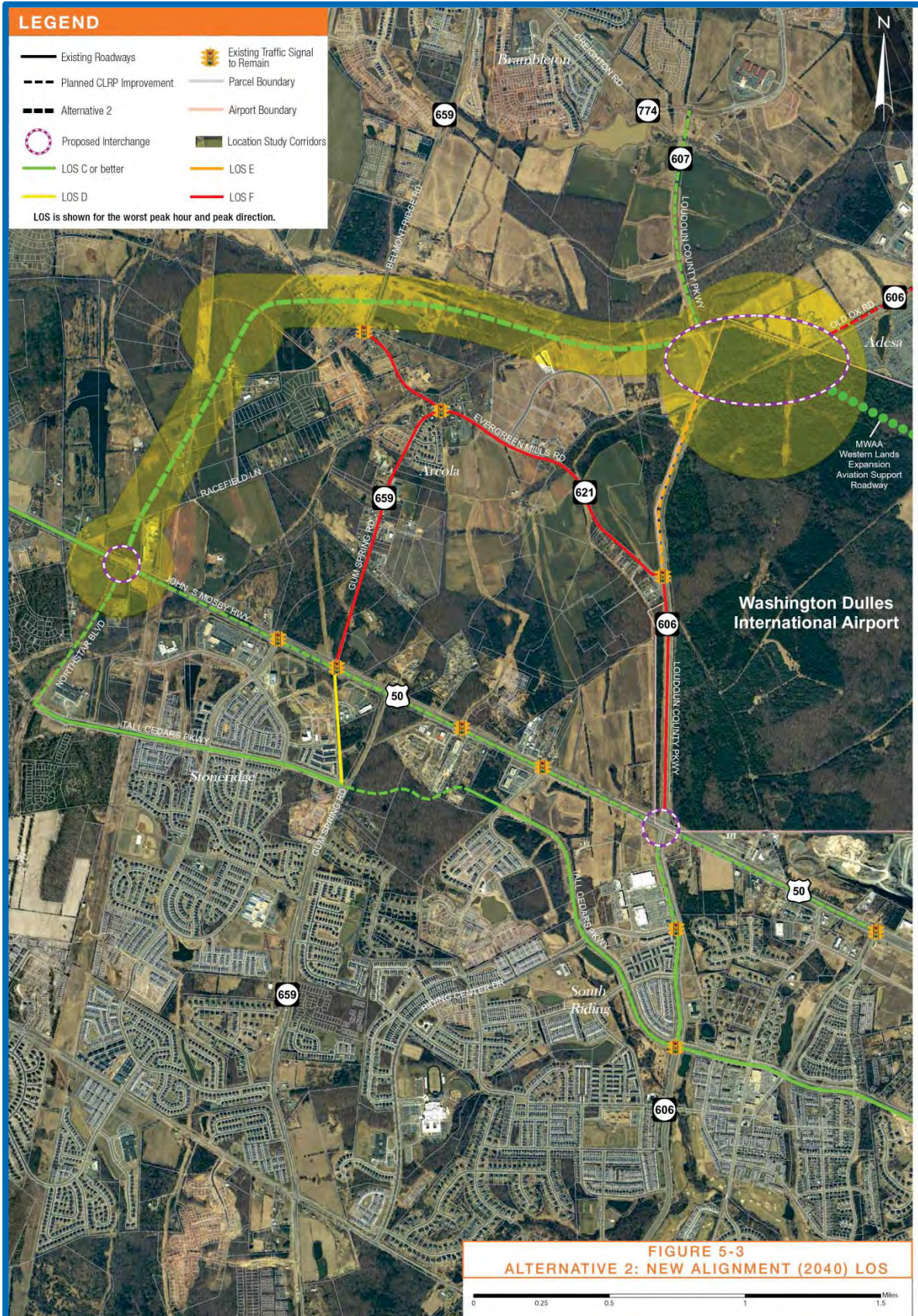
Traffic operations analyses for the build alternatives were completed using Synchro and ENTRADA as described in Section 5.1 for the 2040 design year. The HCM Signals reports and ENTRADA are included in Appendix C. Table 5-5 and Figures 5-3, 5-4 and 5-5 display the LOS for Alternatives 2, 3A and 3B, respectively.

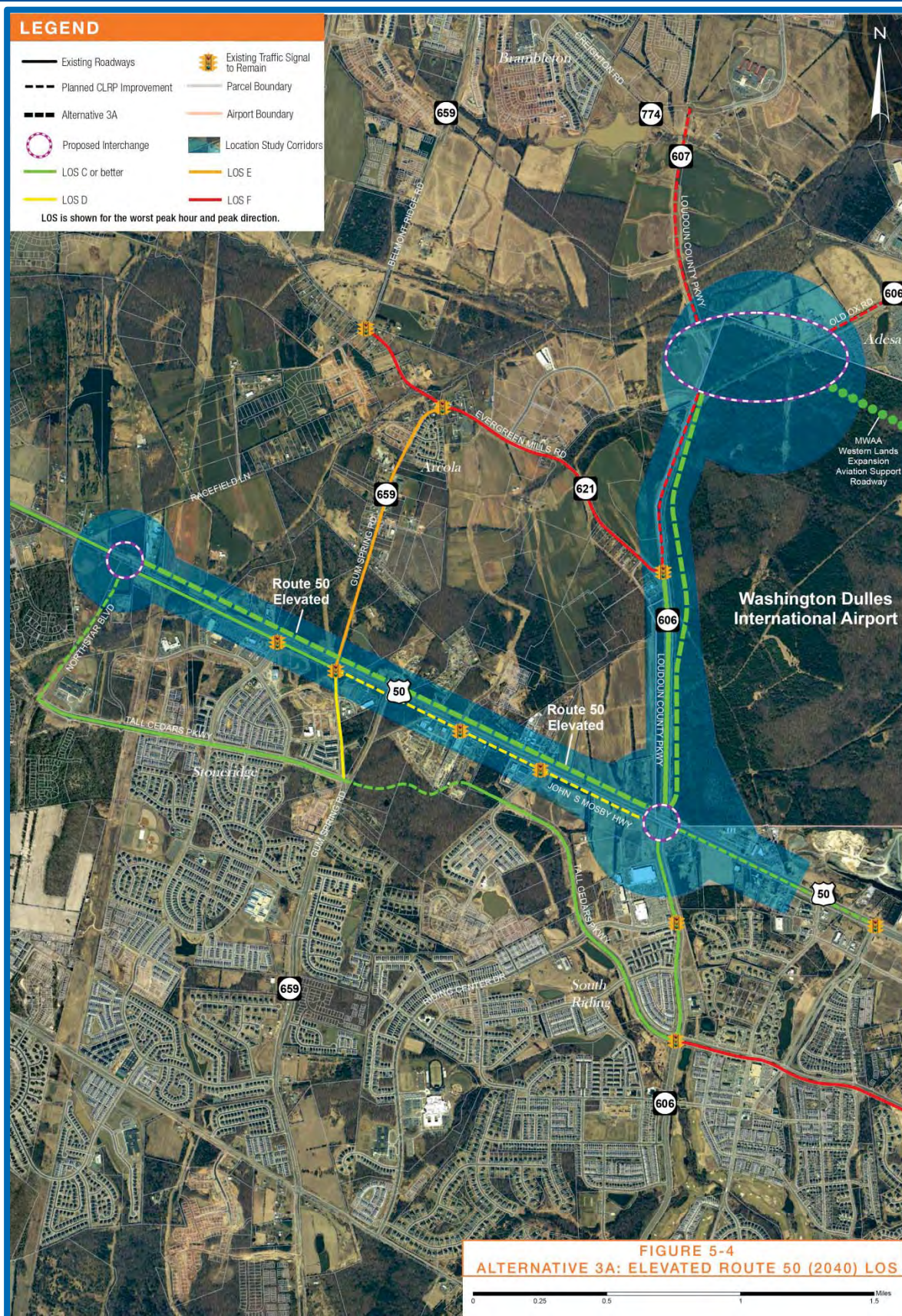
Alternative 2 consists of a new roadway originating at US Route 50 where the Bi-County Parkway (VA Route 411) interchange is planned and extending in a northeasterly direction to an interchange with Old Ox Road (VA Route 606), the planned Loudoun County Parkway (VA Route 607) extension, and future airport connector roads. The new alignment roadway is projected to operate at LOS B. In Alternative 2, the LOS is projected to be C or better on US Route 50. Loudoun County Parkway is projected to operate at LOS E or F between US Route 50 and the proposed Loudoun County Parkway/Old Ox Road/MWAA interchange. Gum Spring Road is projected to operate at LOS D south of US 50 and LOS F north of US Route 50. Evergreen Mills Road is projected to operate at LOS F within the study limits. Tall Cedars Parkway east of Loudoun County Parkway is anticipated to operate at LOS B or better.

Alternative 3A consists of a four-lane elevated structure along US Route 50 from Northstar Boulevard to Loudoun County Parkway. North of the interchange with Loudoun County Parkway, Alternative 3A is a four-lane parallel, separate roadway located east of Loudoun County Parkway. The elevated structure and parallel roadway is projected to operate at LOS C or better. In Alternative 3A, US Route 50 is projected to operate at LOS C west of Gum Spring Road and LOS D east of Gum Spring Road to Loudoun County Parkway. Loudoun County Parkway is projected to operate at LOS C or better south of Evergreen Mills Road and operate at LOS F north of Evergreen Mills Road. Gum Spring Road is projected to operate at LOS D south of US Route 50 and LOS E north of US Route 50. Evergreen Mills Road is projected to operate at LOS F within the study limits. Tall Cedars Parkway east of Loudoun County Parkway is anticipated to operate at LOS F.

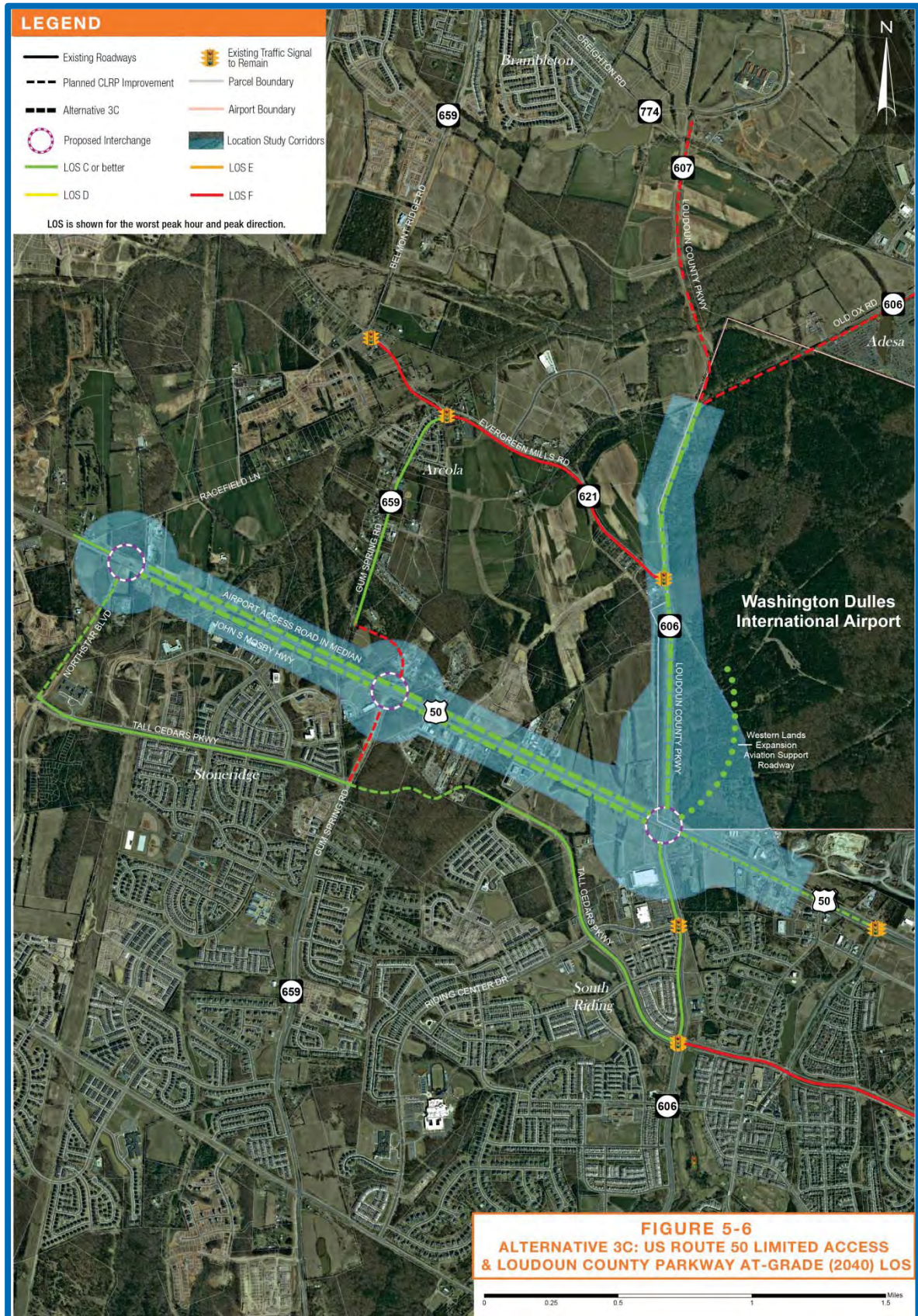
In Alternative 3B, US Route 50 and Loudoun County Parkway are converted to limited access freeway facilities with six lanes (plus two auxiliary lanes) and eight lanes, respectively. In Alternative 3B, both US Route 50 and Loudoun County Parkway are anticipated to operate at LOS C or better from Northstar Boulevard to the Loudoun County Parkway/Old Ox Road/MWAA interchange. Both Gum Spring Road and Evergreen Mills Road are projected to operate at LOS F within the study limits. Tall Cedars Parkway east of Loudoun County Parkway is anticipated to operate at LOS F.

In Alternative 3C, US Route 50 is converted to a limited access freeway facility with six lanes (plus two auxiliary lanes), and two dedicated lanes for traffic in and out of IAD. Loudoun County Parkway would be widened to six lanes between its interchange with US Route 50 and the split between the planned Loudoun County Parkway (VA Route 607) and VA Route 606. Both US Route 50 and Loudoun County Parkway are anticipated to operate at LOS C or better from Northstar Boulevard to the Loudoun County Parkway/Old Ox Road intersection. Both Gum Spring Road (south of US Route 50) and Evergreen Mills Road are projected to operate at LOS F within the study limits. Tall Cedars Parkway east of Loudoun County Parkway is anticipated to operate at LOS F.









5.5 Comparison of Build Alternatives

Table 5-5 presents a comparison of LOS for existing (2012) conditions and all 2040 build alternatives. The following summarizes key findings when comparing the alternatives under consideration for future (2040) conditions:

- The new and/or reconstructed roadway segments for all four build alternatives (i.e., Alternatives 2, 3A, 3B and 3C) will operate at LOS C or better. For Alternative 2, this includes the new alignment roadway. For Alternative 3A, this includes the elevated structure along US Route 50 and the parallel roadway along Loudoun County Parkway. For Alternatives 3B and 3C, this includes US Route 50 from Northstar Boulevard to Loudoun County Parkway and Loudoun County Parkway from US Route 50 to the Old Ox Road / MWAA interchange.
- Along US Route 50 from Northstar Boulevard to Loudoun County Parkway, Alternatives 2, 3B and 3C will operate at LOS C or better. Alternative 3A will operate at LOS D in the AM peak hour between Gum Spring Road and Loudoun County Parkway. This is primarily due to proposed elevated structure not attracting enough traffic from the existing US Route 50 lanes. Under No Build conditions, US Route 50 is anticipated to operate at LOS D between Northstar Boulevard and Gum Spring Road and LOS F between Gum Spring Road and Loudoun County Parkway.
- Along Loudoun County Parkway between US Route 50 and Old Ox Road, Alternatives 3B and 3C are the only alternatives that results in LOS C or better. Alternatives 1, 2, and 3A result in LOS F for one or more segments along Loudoun County Parkway between US Route 50 and Old Ox Road.
- Access to existing properties along US Route 50 will be maintained with Alternatives 2 and 3A. With Alternatives 3B and 3C, access to properties to the south would be provided from Tall Cedars Parkway. Access to properties to the north would be provided from a parallel frontage road accessed from Gum Spring Road (VA Route 659).
 - As a result of limiting access along US Route 50 with Alternatives 3B and 3C, the LOS on Gum Spring Road from Tall Cedars Parkway to US Route 50 is anticipated to degrade from LOS D with Alternatives 1, 2 and 3A to LOS F with Alternatives 3B and 3C. Motorists along the south side of US Route 50 will be required to use either Loudoun County Parkway or Gum Spring Road to access US Route 50.
- Alternative 2 results in LOS C or better conditions along the entire length of Tall Cedars Parkway. With Alternatives 3B and 3C, Tall Cedars Parkway will provide access to properties along the south side of US Route 50, resulting in higher volumes and LOS F, east of Loudoun County Parkway. With Alternative 3A, due to capacity issues along US Route 50, Tall Cedars Parkway east of Loudoun County Parkway will operate at LOS F.
- Evergreen Mills Road within the project limits is anticipated to operate at LOS F with all alternatives under consideration.
- Gum Spring Road north of US Route 50 to Evergreen Mills Road will operate at LOS E or F with Alternatives 2, 3A and 3B. Alternative 3C will operate at C or better in this segment.

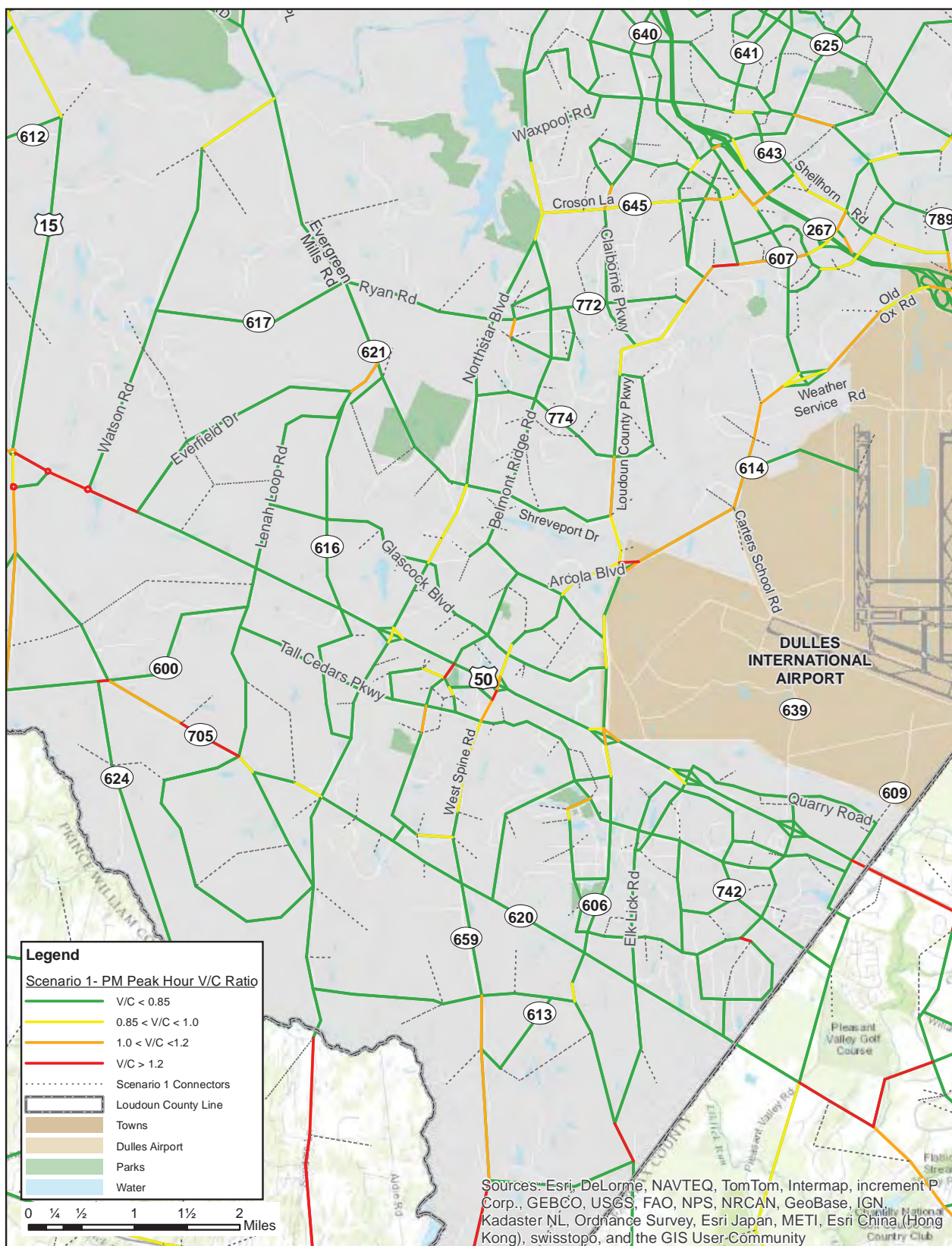
Table 5-5: Segment LOS for Existing Conditions and all Alternatives

Roadway	Link	Existing (2012)	2040 Alt. 1 (No-Build)		2040 Alt. 2 (New Alignment)		2040 Alt. 3A (Route 50 Elevated)		2040 Alt. 3B (Loudoun County CTP)		2040 Alt. 3C (Route 50 Limited Access and Loudoun County Pkwy. At-Grade)	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
US Route 50	West of Northstar Blvd	A	A	A	C	A	A	A	A	A	A	A
	Northstar Blvd	B	C	D	C	C	C	C	B	C	A	B
	Gum Spring Road	B	C	F	C	C	D	B	C	B	C	C
	Loudoun County Pkwy	B	A	C	C	B	C	B	B	B	B	A
Elevated US Route 50 (Alt. 3A) / US Route 50 in median (Alt. 3C)	Northstar Blvd	--	--	--	--	--	B	C	--	--	A	A
	Gum Spring Road	--	--	--	--	--	B	C	--	--	A	A
New Alignment (Alt. 2)	US Route 50	--	--	--	B	B	--	--	--	--	--	--
	Loudoun County Pkwy / Old Ox Rd / MWAA Interchange	--	--	--	--	--	--	--	--	--	--	--
MWAA Western Lands Expansion Aviation Support Roadway	Loudoun County Pkwy / MWAA Interchange	--	--	--	A	A	A	A	A	A	A	A
	Tall Cedars Pkwy	A	A	B	B	B	A	B	B	B	B	B
	US Route 50	B	F	F	E	F	C	C	C	C	C	C
	Evergreen Mills Road	D	B	C	E	C	F	C	C	C	C	B
Loudoun County Pkwy	Loudoun County Pkwy / Old Ox Rd	--	B	A	B	A	F	A	F	A	F	A
	Creighton Road	--	--	--	--	--	C	B	--	--	--	--
	Evergreen Mills Road	--	--	--	--	--	--	--	--	--	--	--
	Carters School Road	D	C	F	F	F	E	F	F	F	D	F
Dulles Connector (Parallel to Loudoun County Pkwy)	Loudoun County Pkwy / Old Ox Rd	--	A	A	A	A	A	A	A	A	A	A
	Tall Cedars Pkwy	A	D	A	D	A	D	A	F	A	F	A
	US Route 50	B	B	F	F	B	E	B	F	B	C	B
	Belmont Ridge Road	F	F	F	F	F	F	F	F	F	F	F
Evergreen Mills Road	Gum Spring Road	C	B	F	F	E	F	F	F	F	F	F
	Loudoun County Pkwy	A	A	A	B	A	F	A	F	A	F	A
	South Riding Blvd	--	--	--	--	--	--	--	--	--	--	--
	Loudoun County Pkwy	--	--	--	--	--	--	--	--	--	--	--
Tall Cedars Pkwy	Gum Spring Road	--	--	--	--	--	--	--	--	--	--	--
	Northstar Blvd	--	--	--	--	--	--	--	--	--	--	--
	US Route 50	--	--	--	--	--	--	--	--	--	--	--
	Evergreen Mills Road	--	--	--	--	--	--	--	--	--	--	--

Appendix B



Scenario 1 - PM V/C Ratio



Legend

Scenario 1A -PM V/C Ratio

- V/C < 0.85
- 0.85 < V/C < 1.0
- 1.0 < V/C < 1.2
- V/C > 1.2

Scenario 1A Connectors

Loudoun County Line

Parks

Water

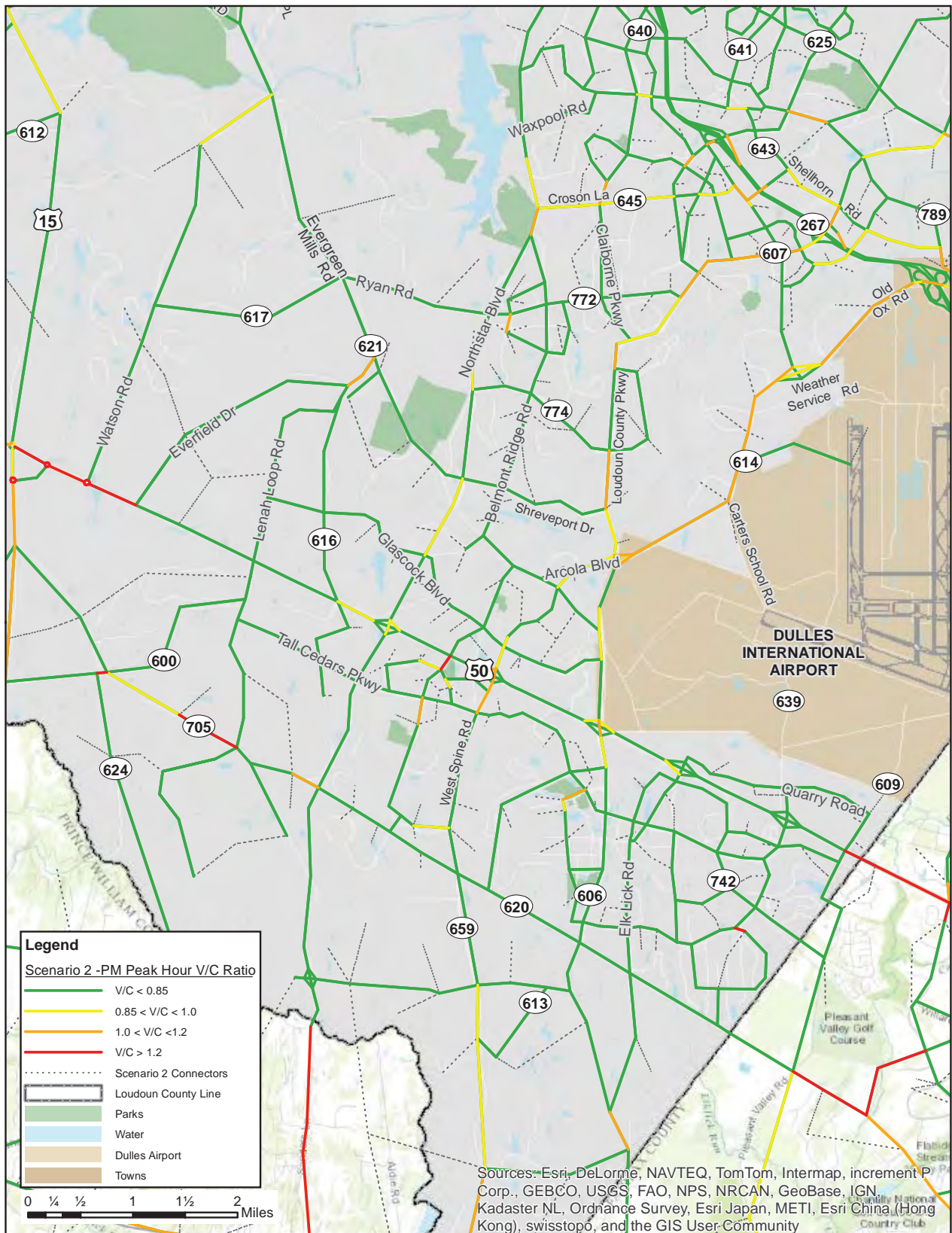
Dulles Airport

Towns

Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

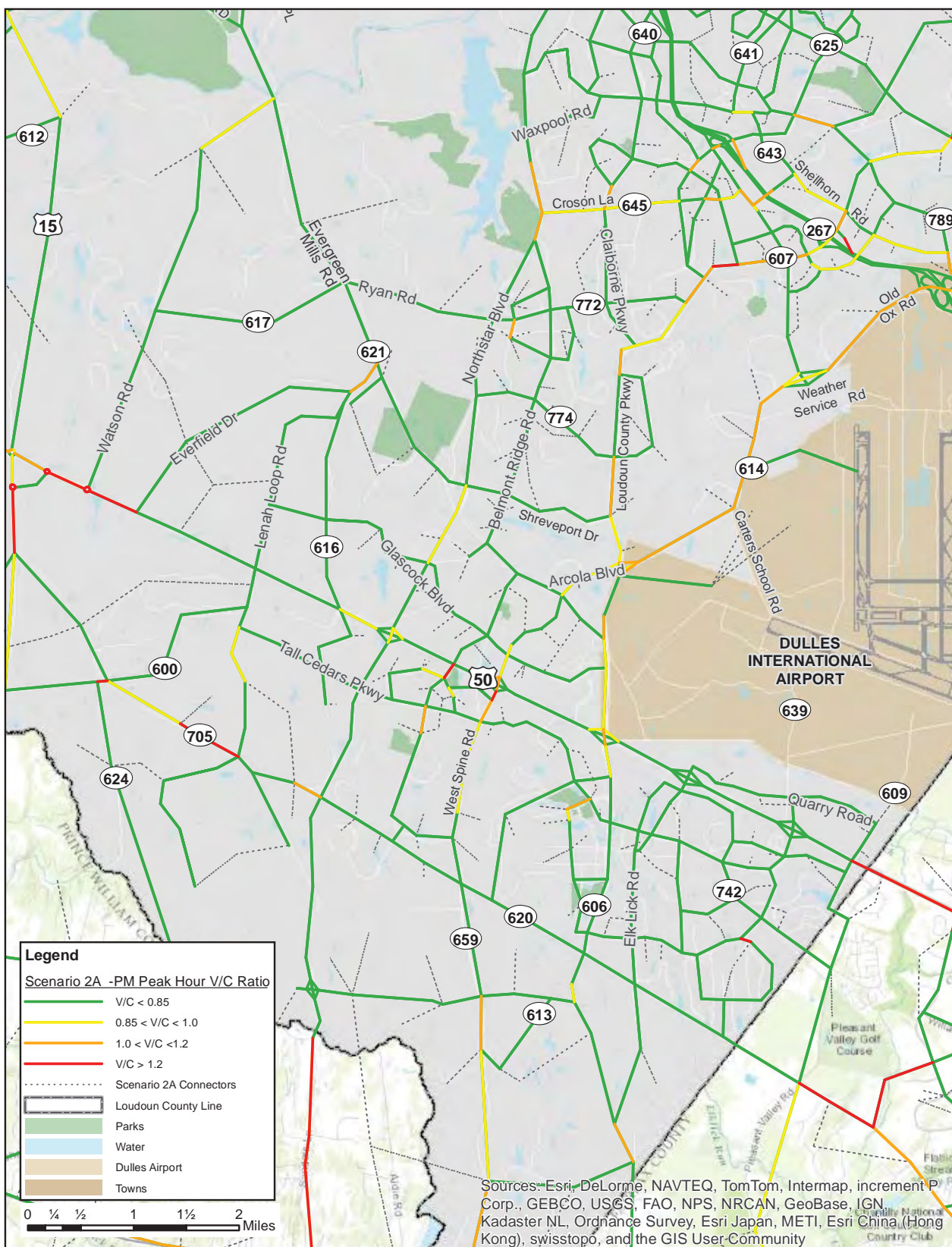


Scenario 2 - PM V/C Ratio



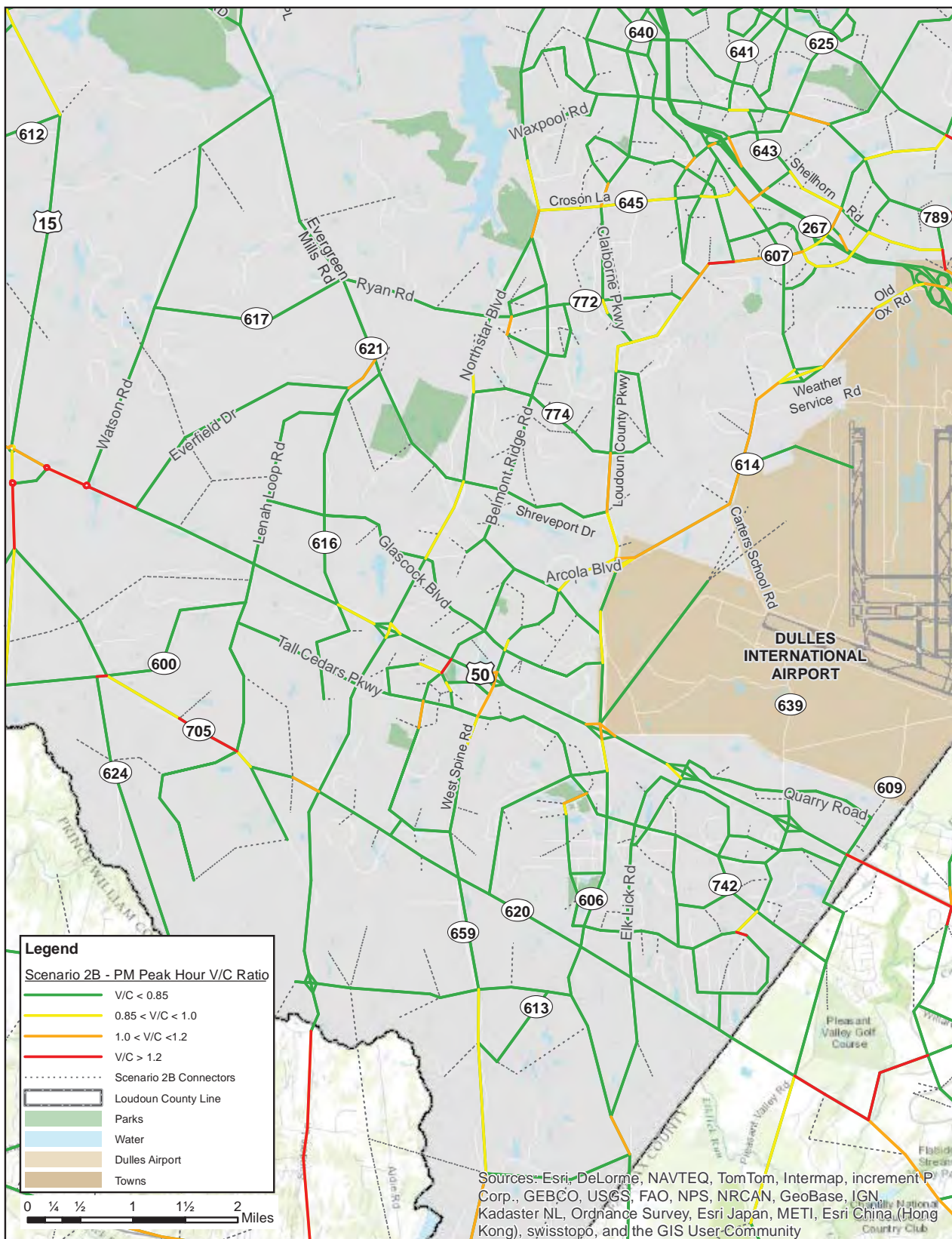


Scenario 2A - PM V/C Ratio



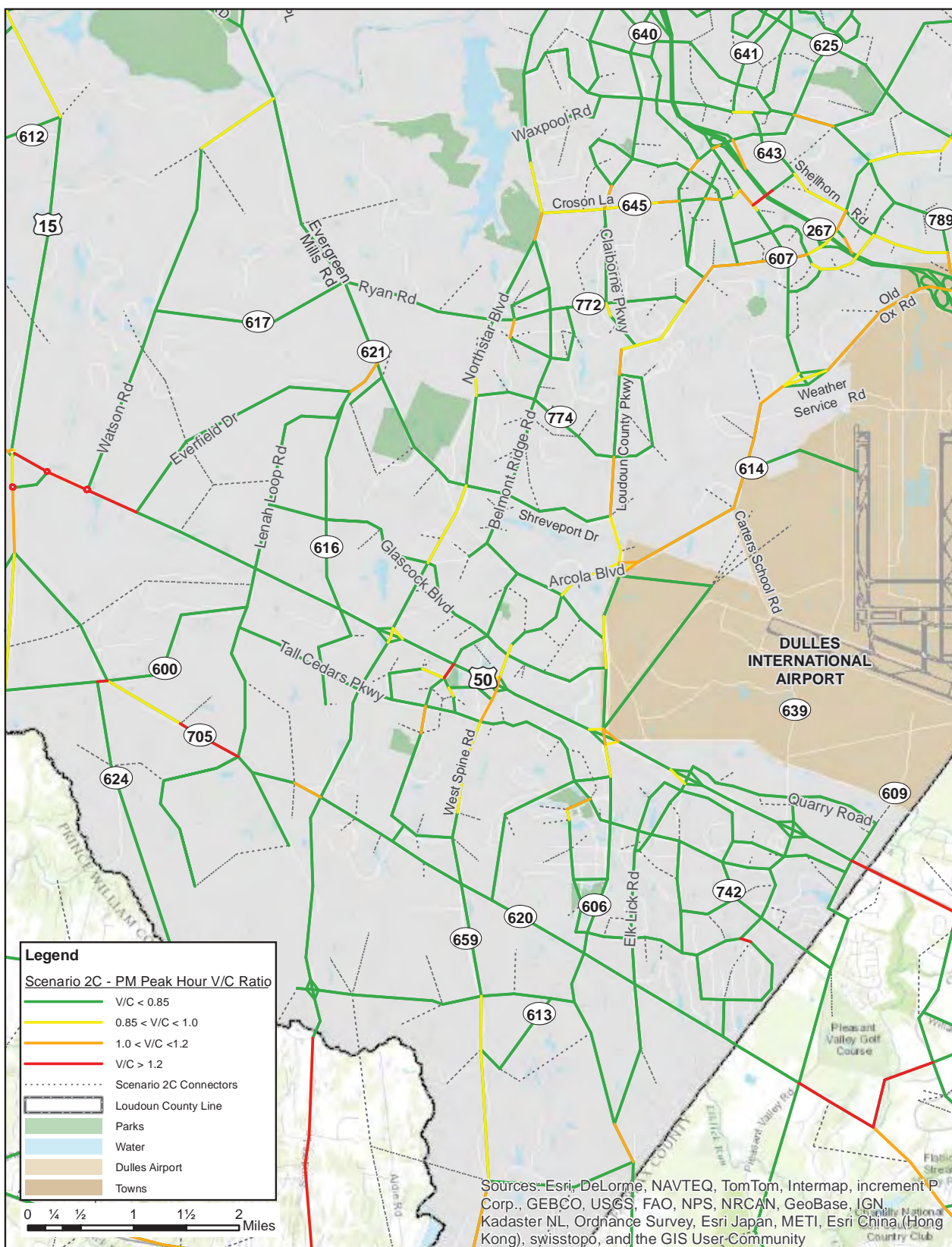


Scenario 2B - PM V/C Ratio



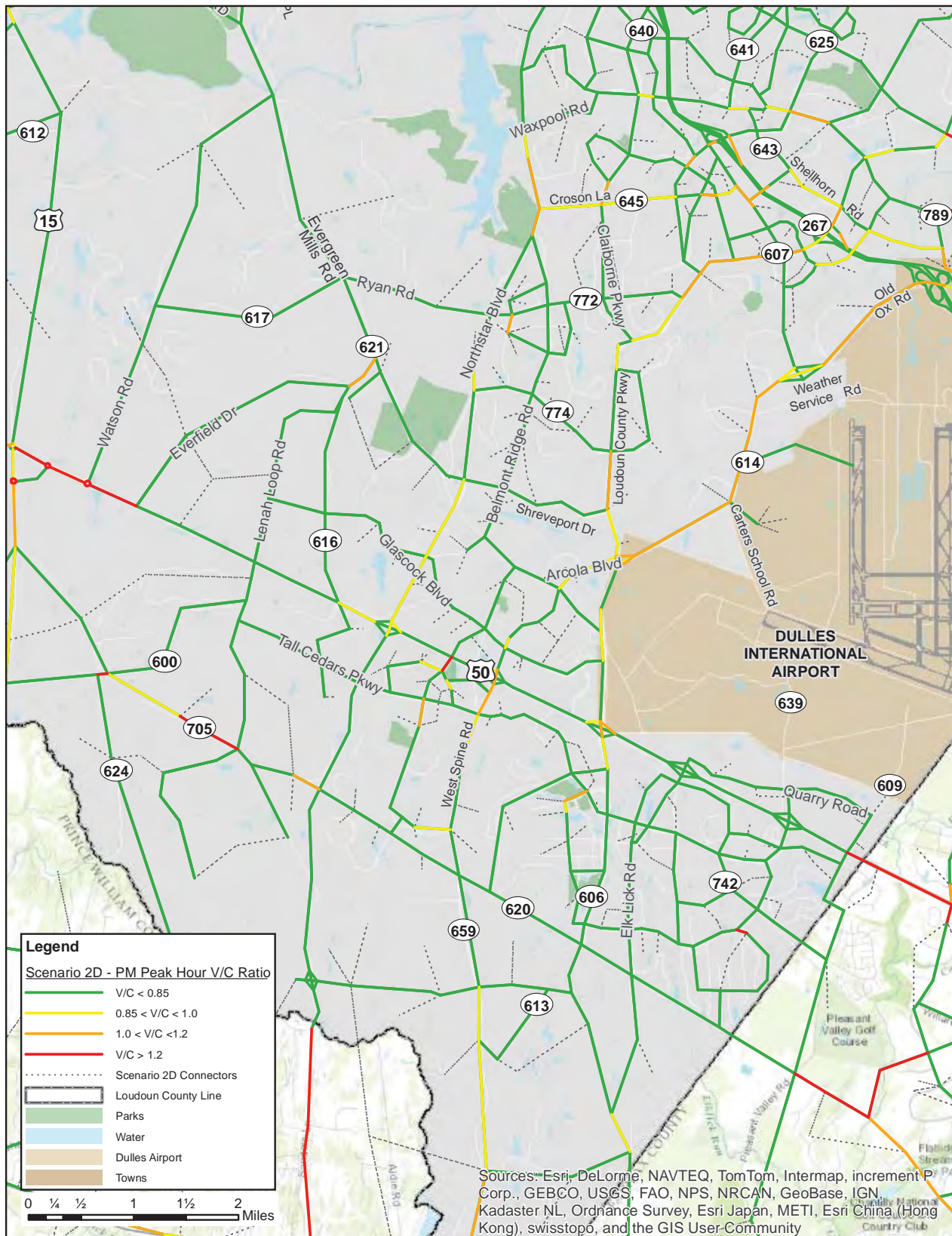


Scenario 2C - PM V/C Ratio



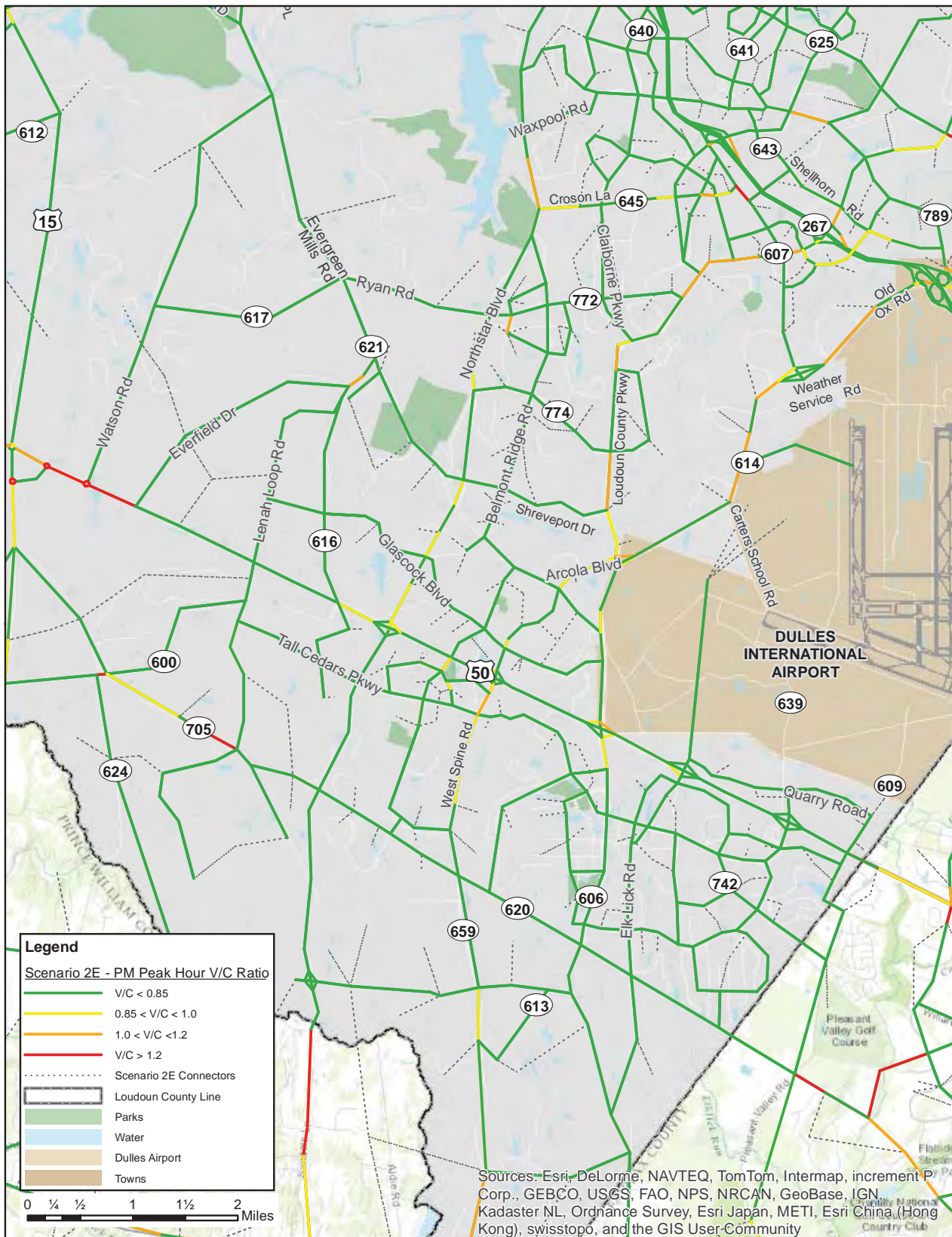


Scenario 2D - PM V/C Ratio



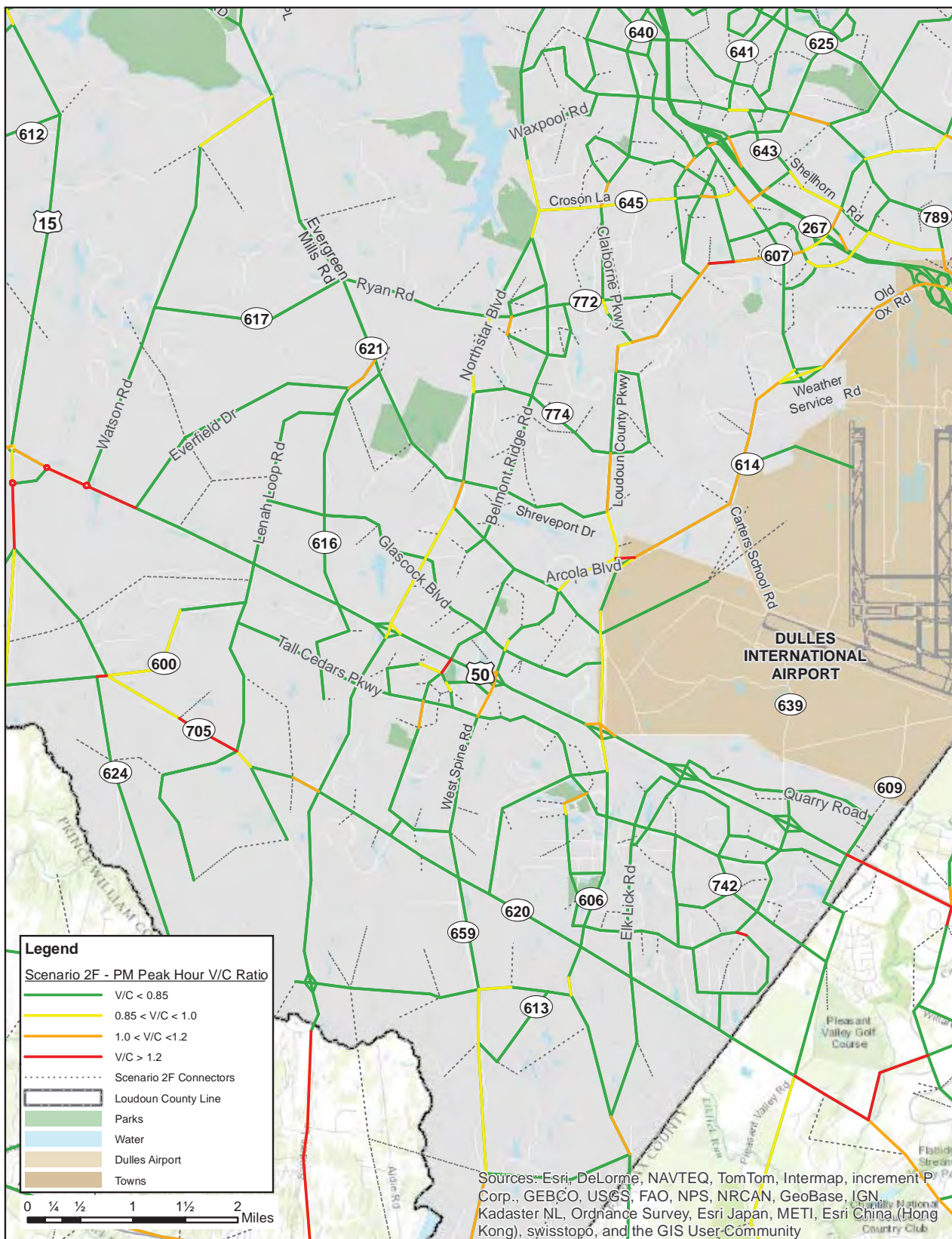


Scenario 2E - PM V/C Ratio



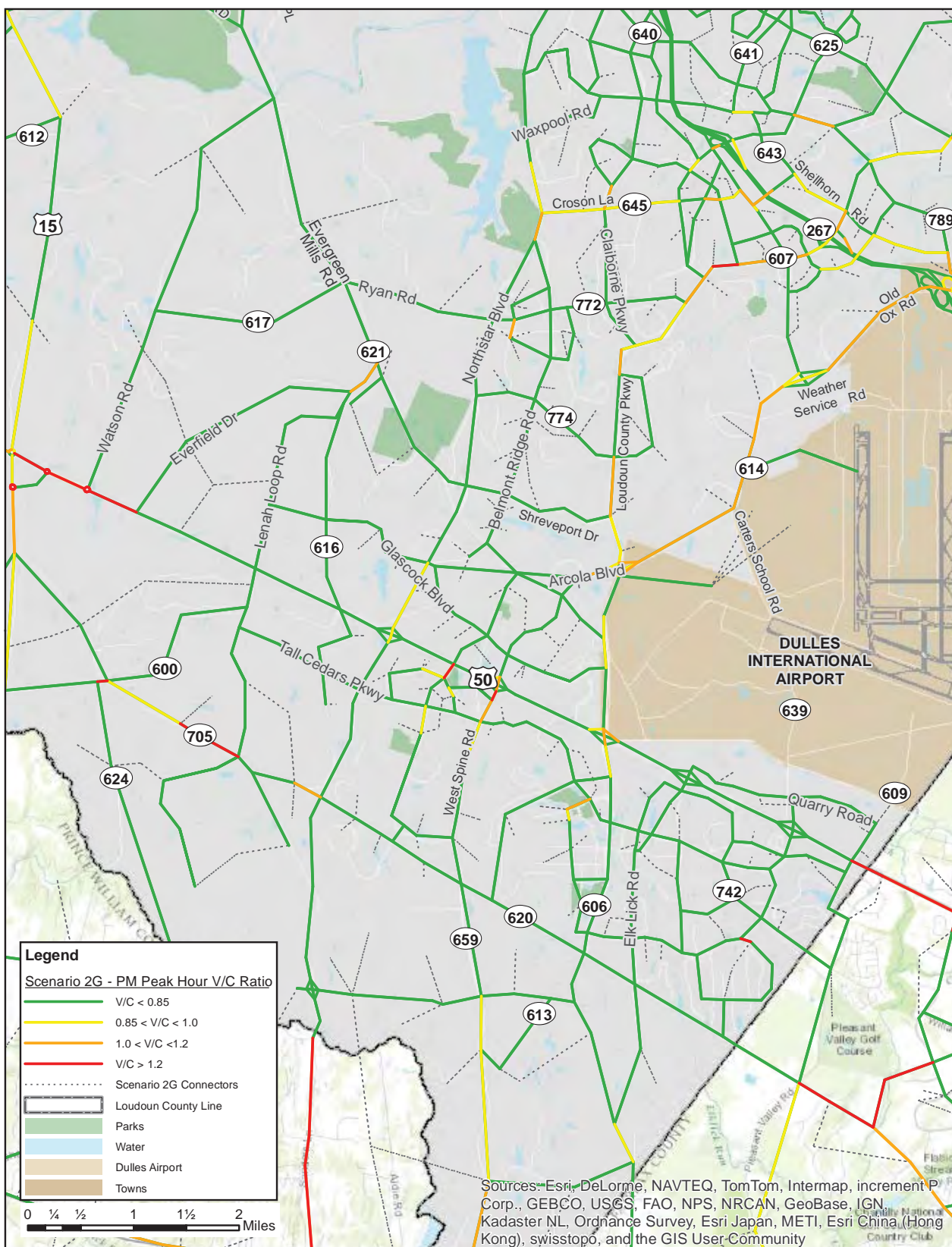


Scenario 2F - PM V/C Ratio



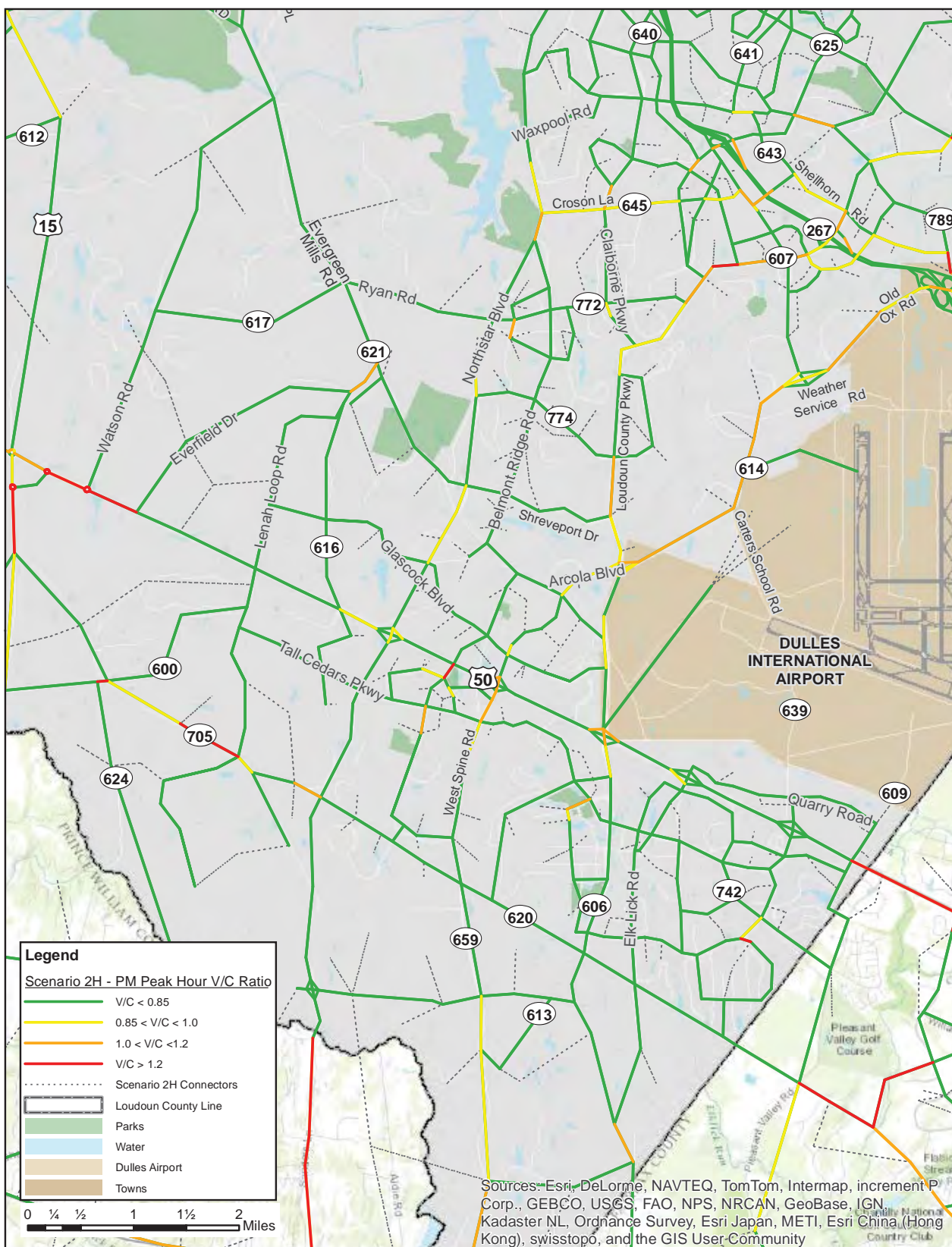


Scenario 2G - PM V/C Ratio





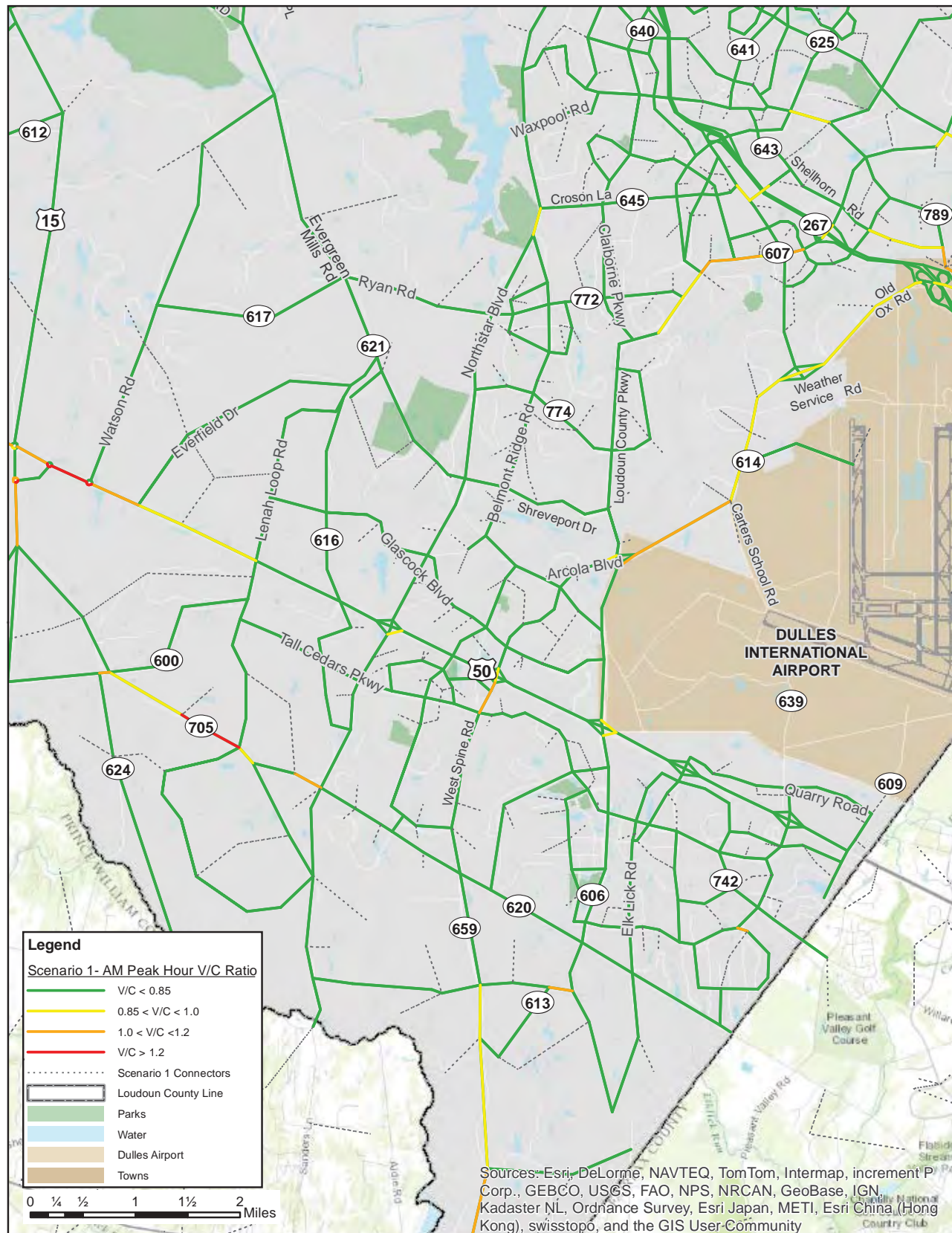
Scenario 2H - PM V/C Ratio



Appendix C

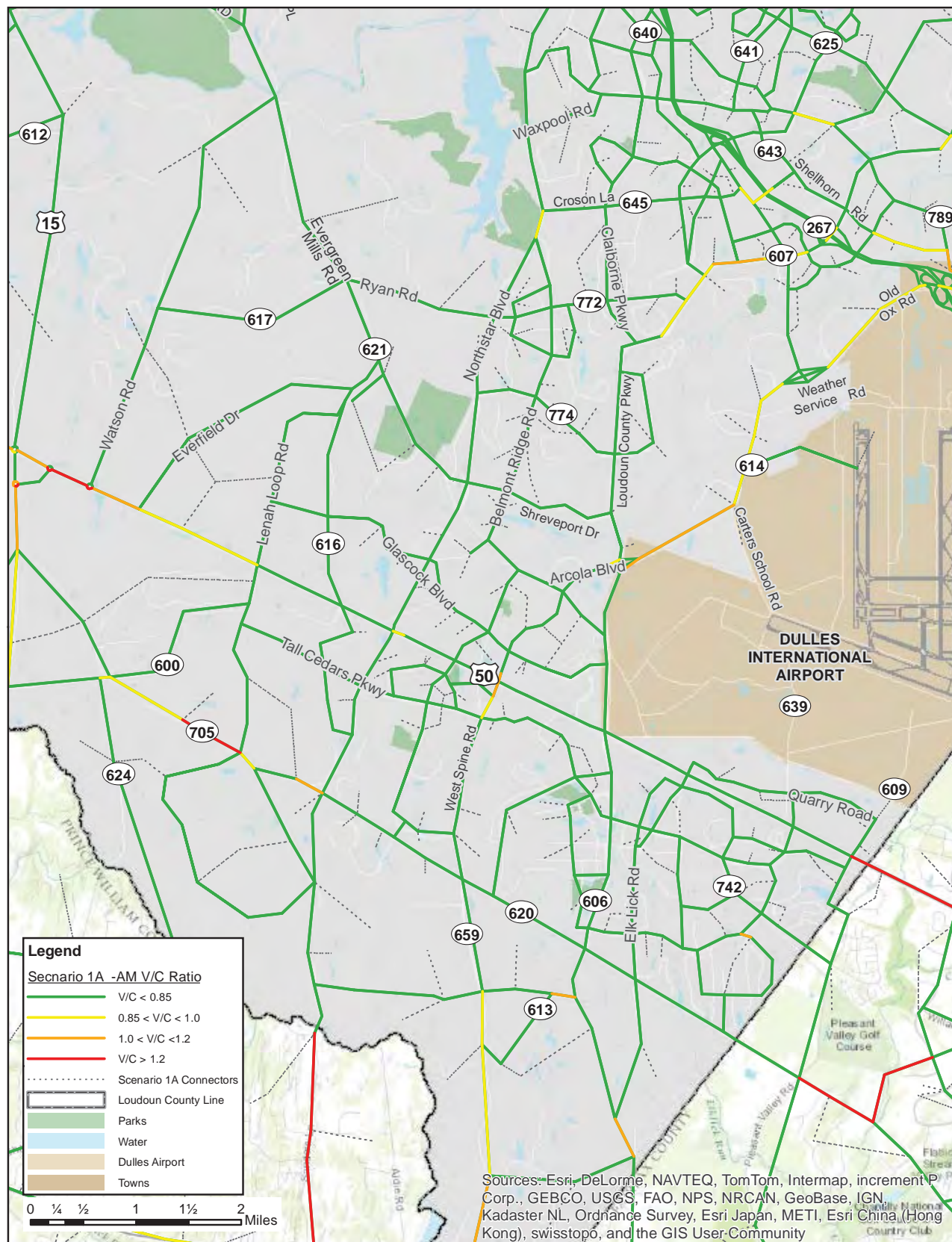


Scenario 1 - AM Peak Hour V/C Ratios



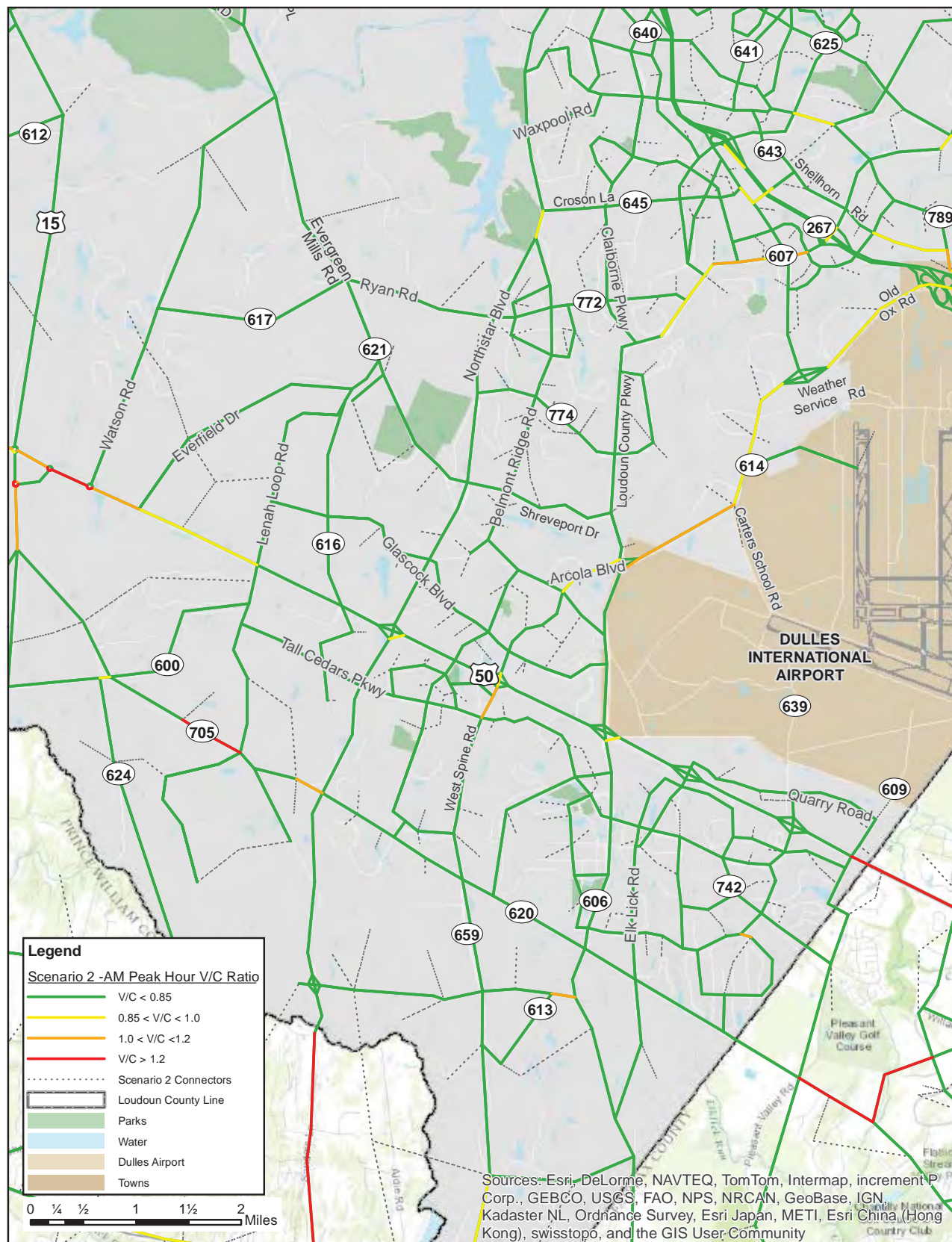


Scenario 1A - AM Peak Hour V/C Ratios



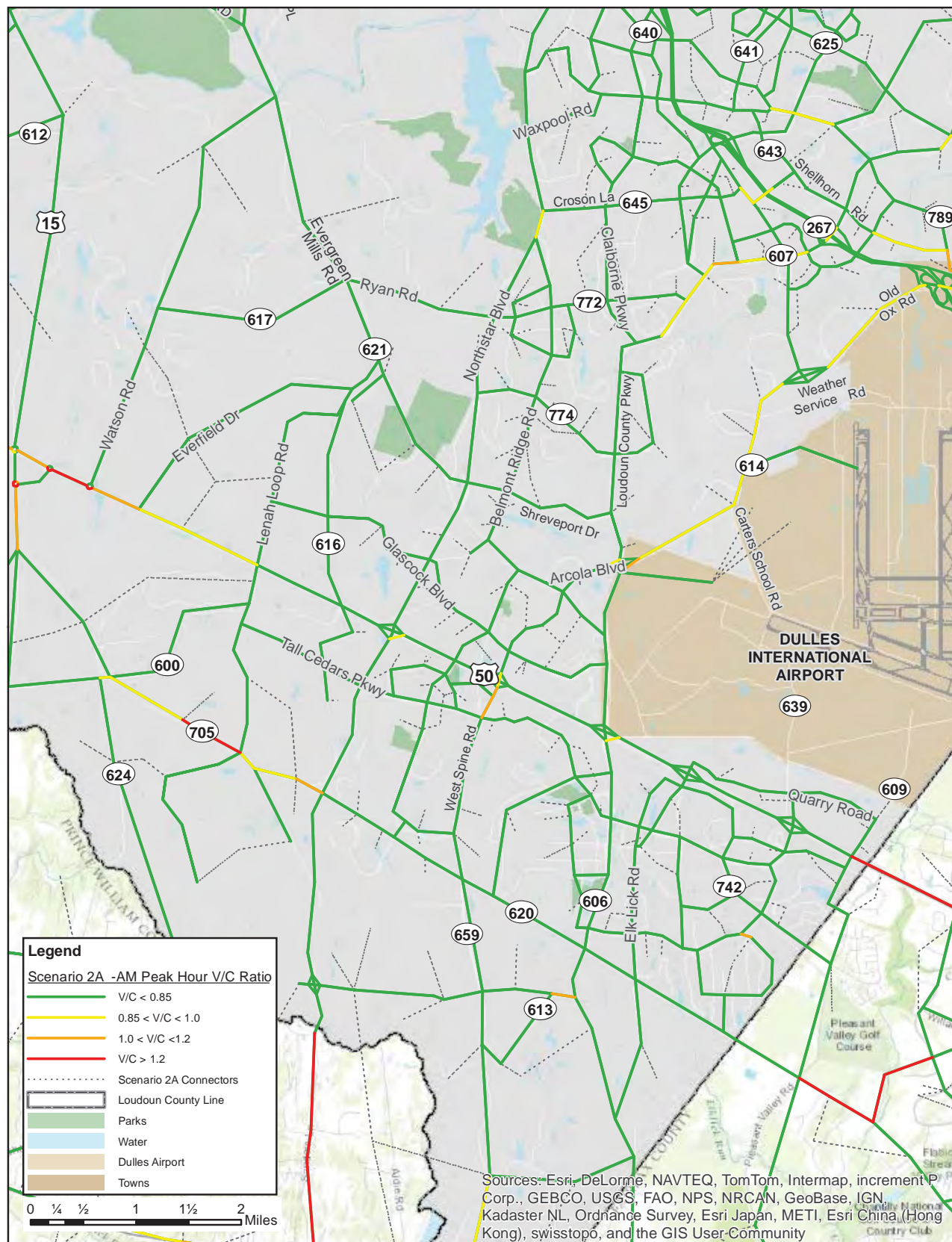


Scenario 2 - AM Peak Hour V/C Ratios



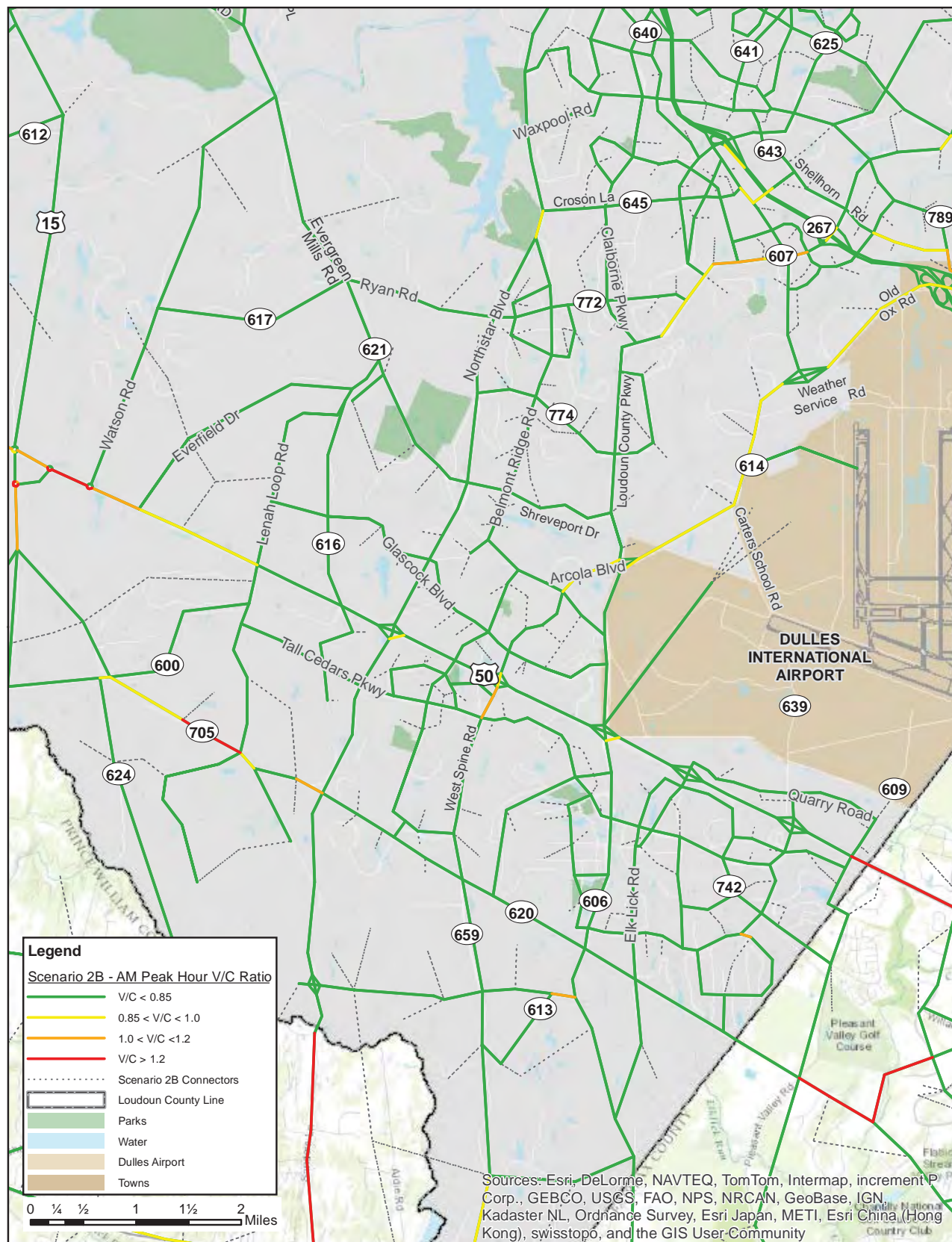


Scenario 2A - AM Peak Hour V/C Ratios



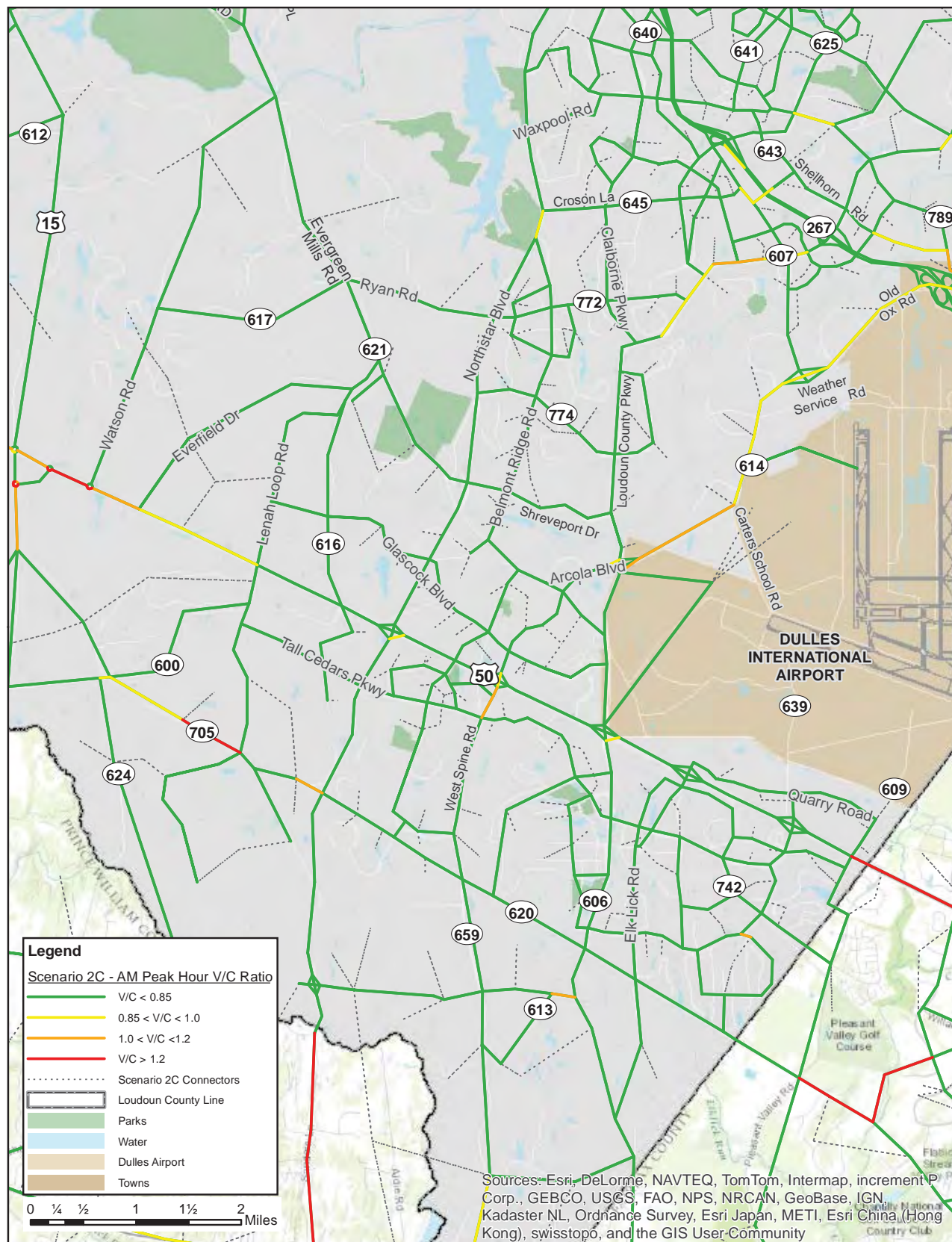


Scenario 2B - AM Peak Hour V/C Ratios



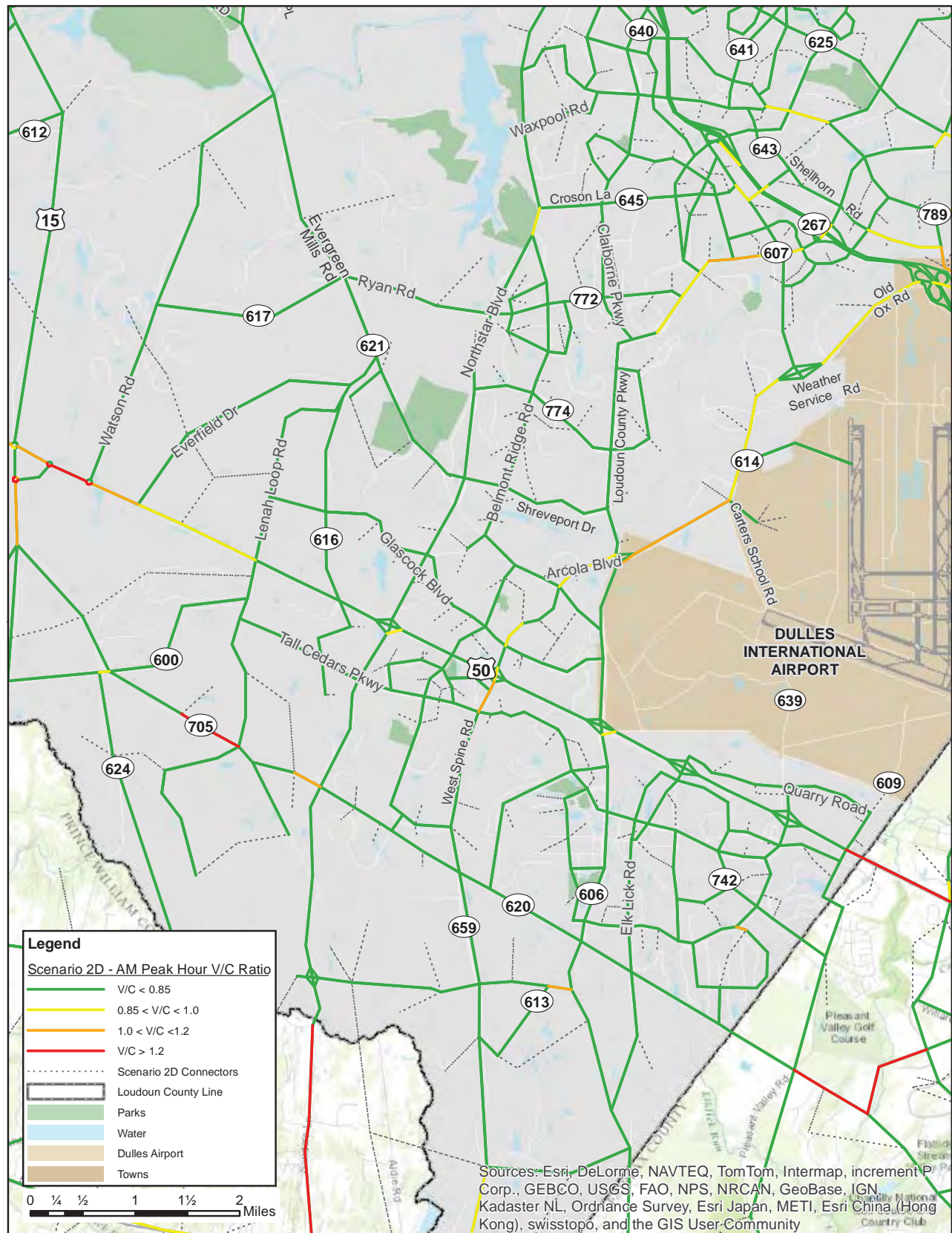


Scenario 2C - AM Peak Hour V/C Ratios



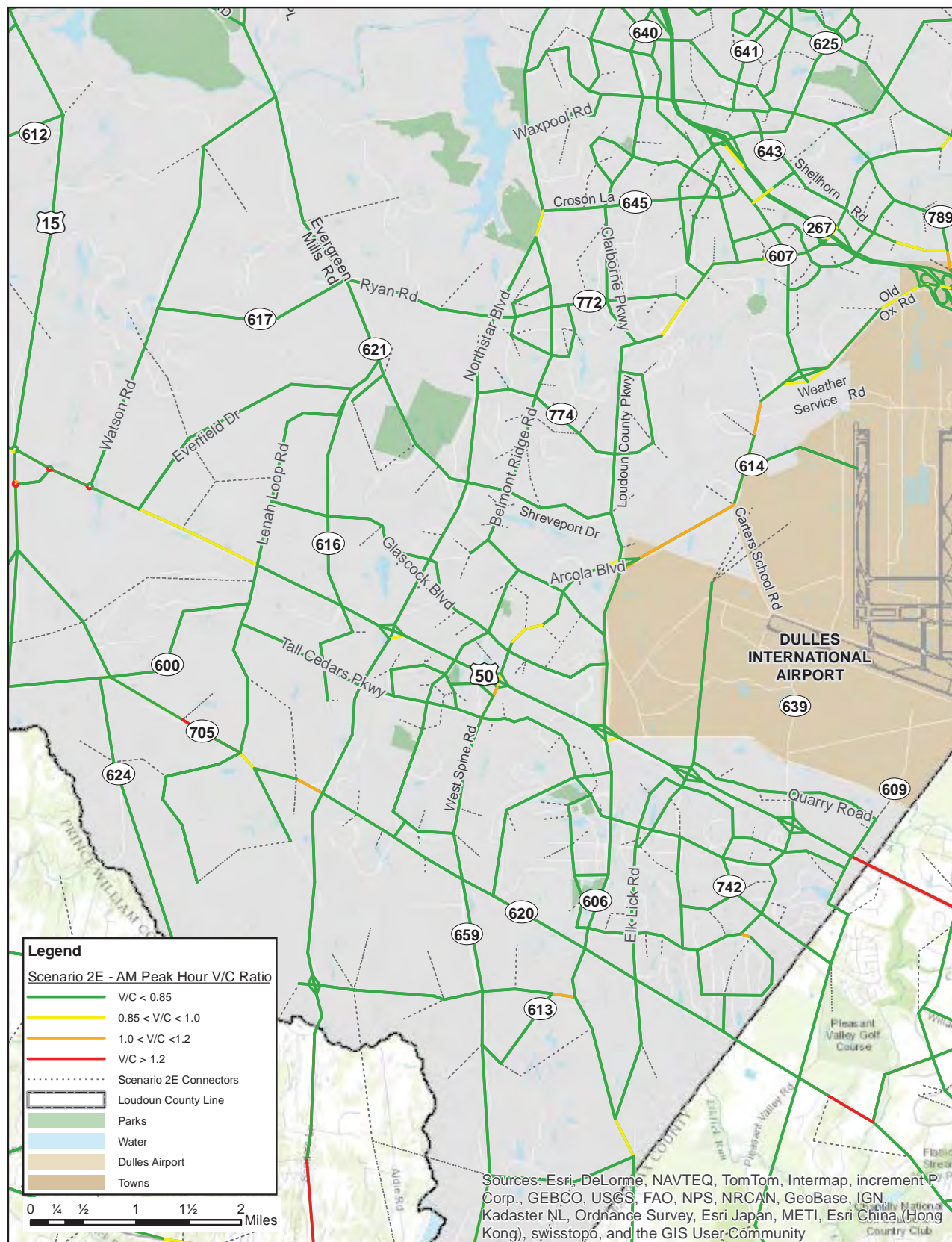


Scenario 2D - AM Peak Hour V/C Ratios



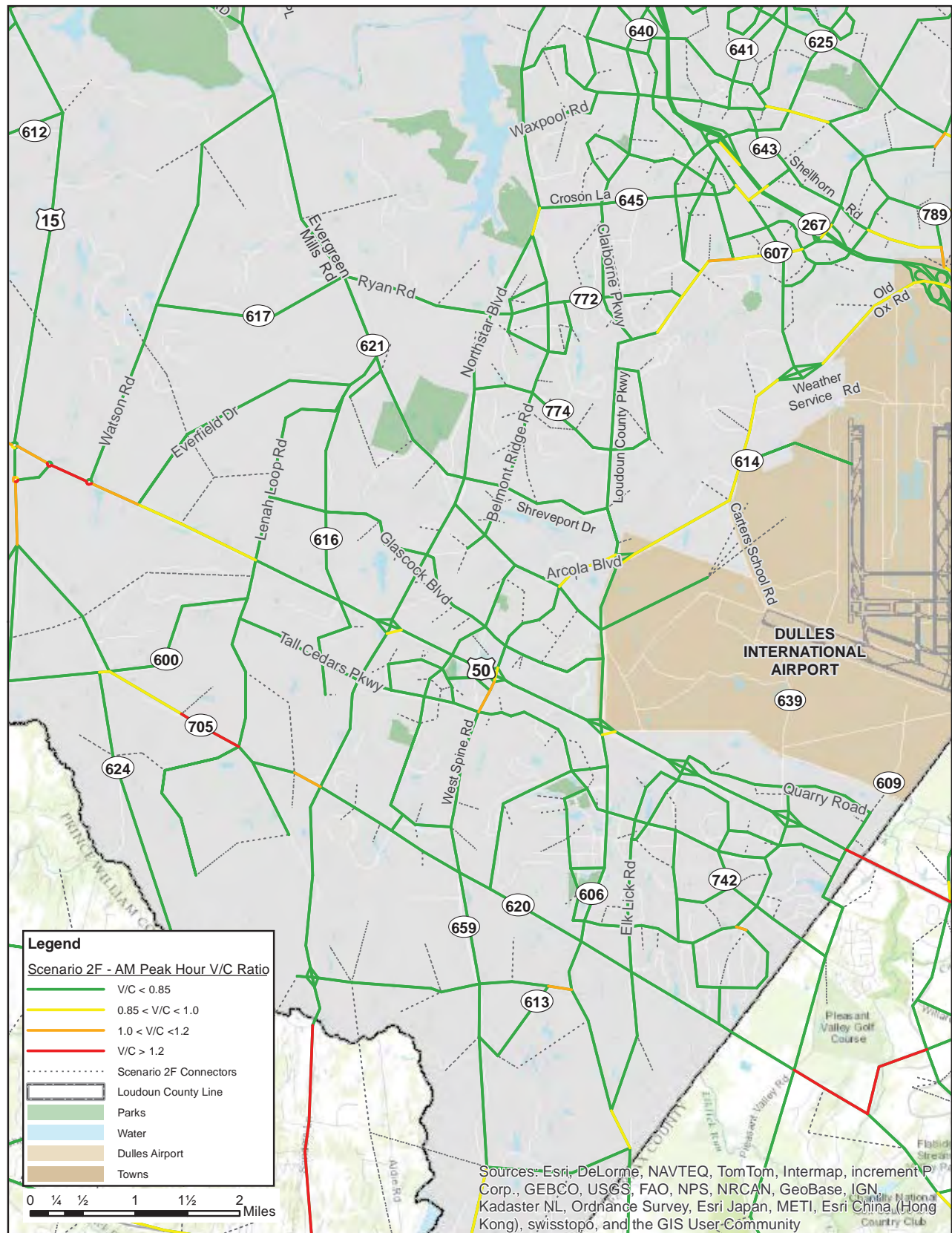


Scenario 2E - AM Peak Hour V/C Ratios



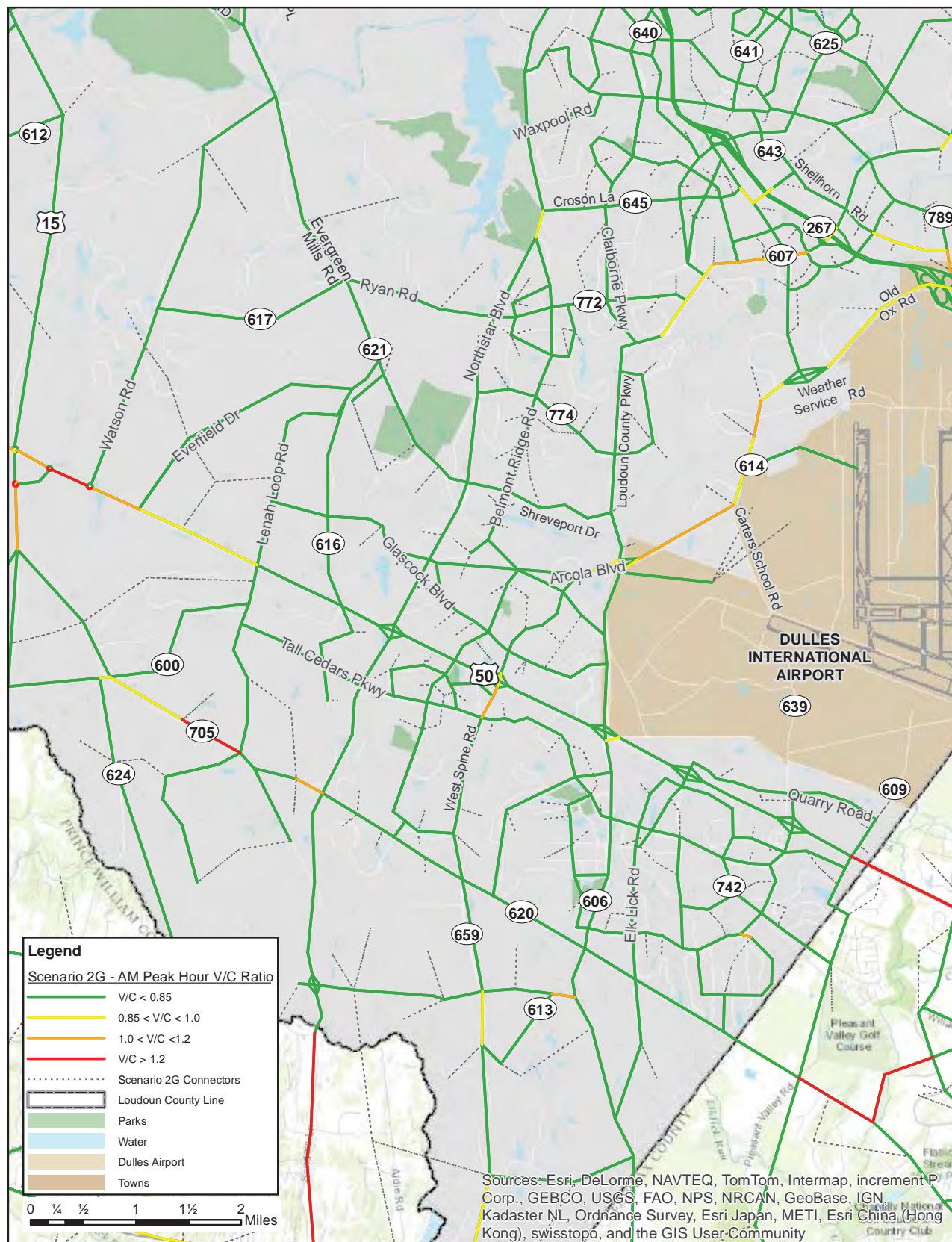


Scenario 2F - AM Peak Hour V/C Ratios



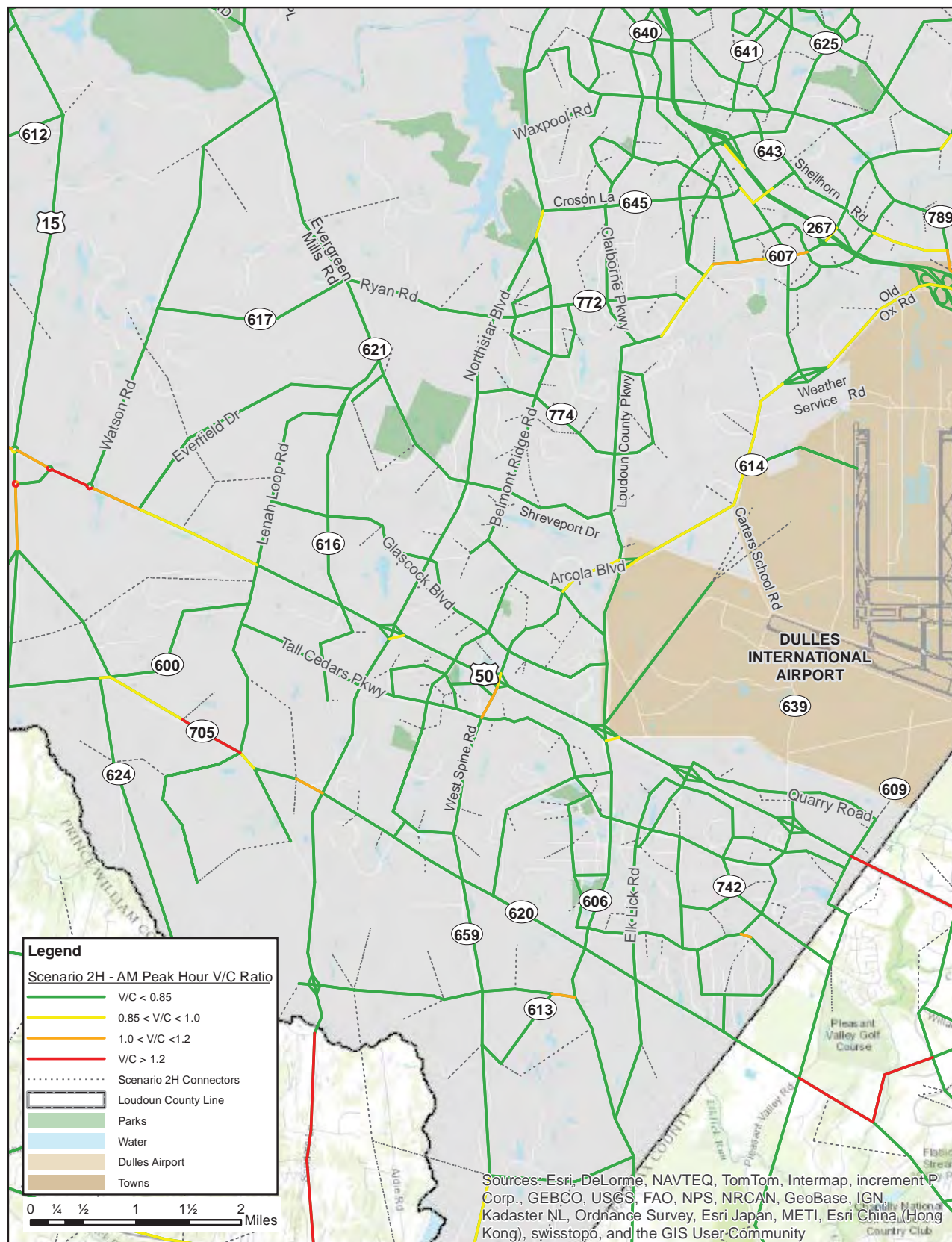


Scenario 2G - AM Peak Hour V/C Ratios

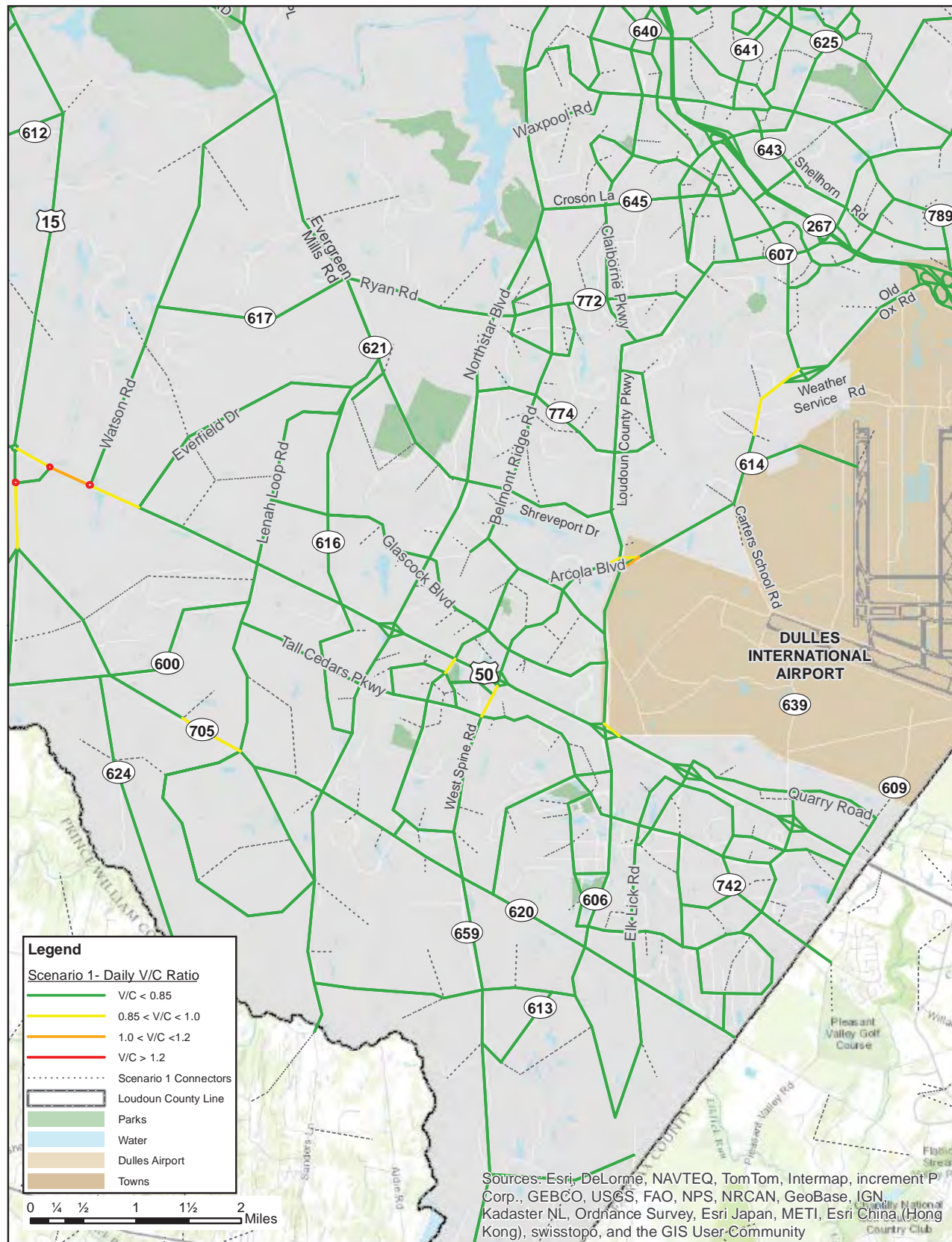




Scenario 2H - AM Peak Hour V/C Ratios

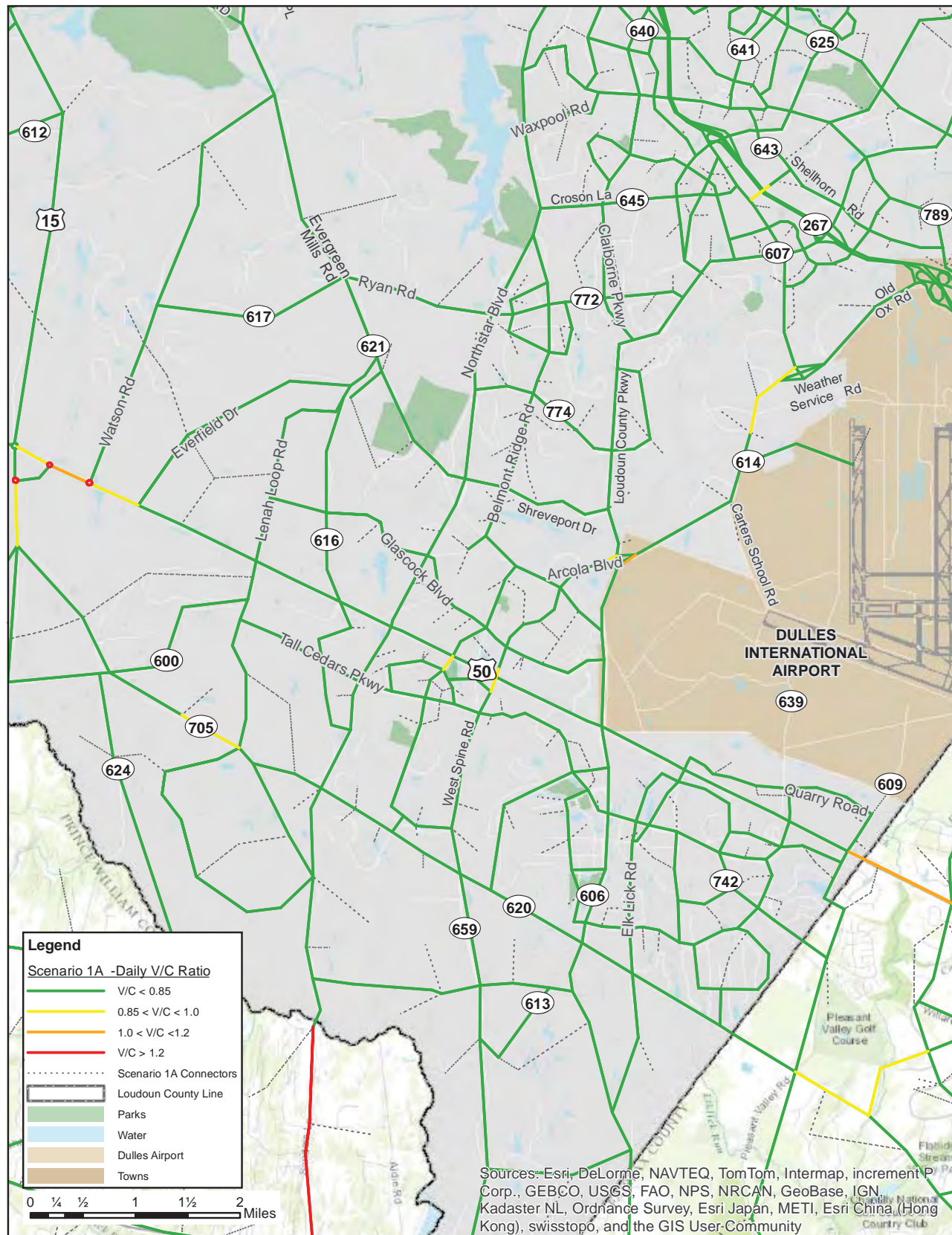


Scenario 1 - Daily V/C Ratios



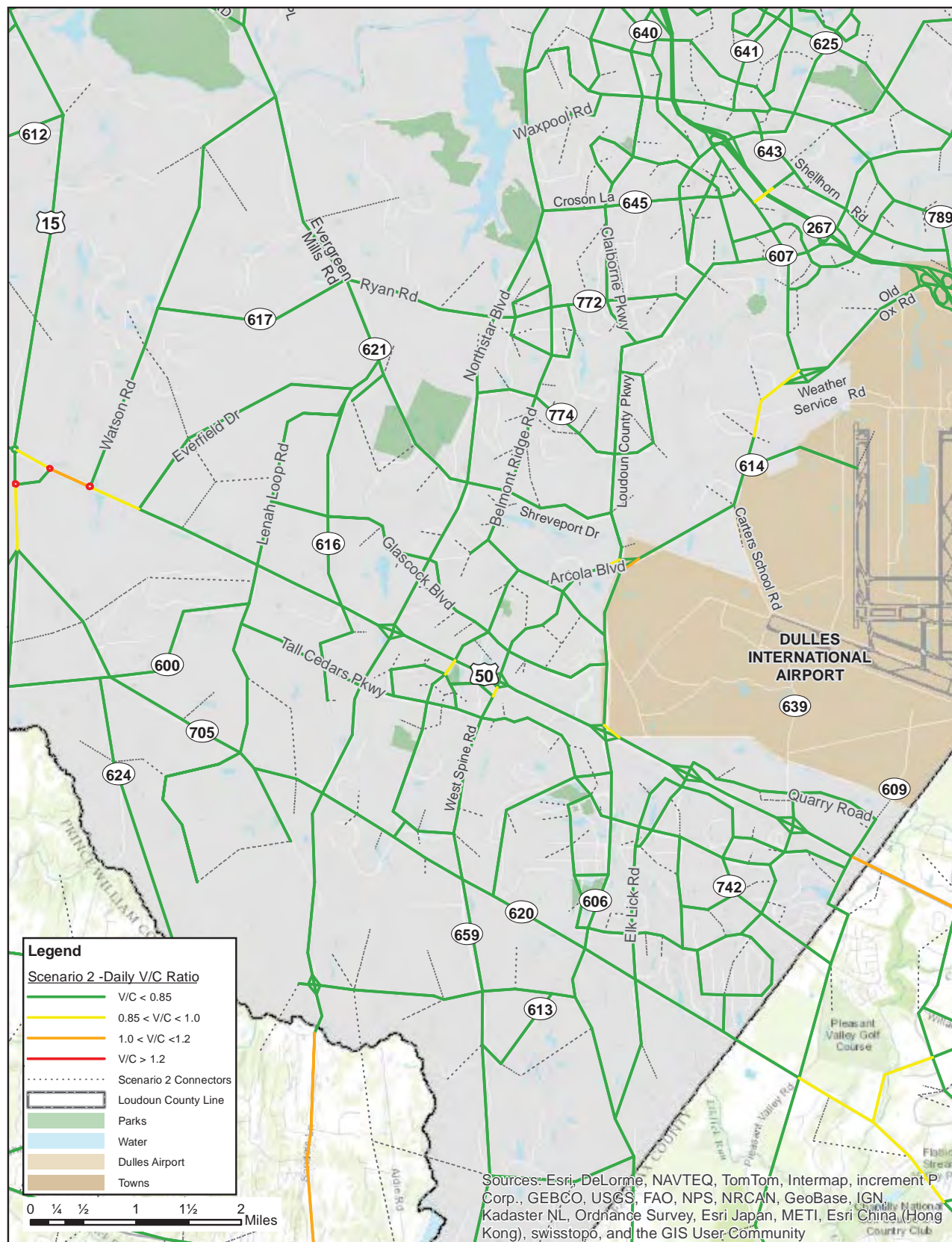


Scenario 1A - Daily V/C Ratios



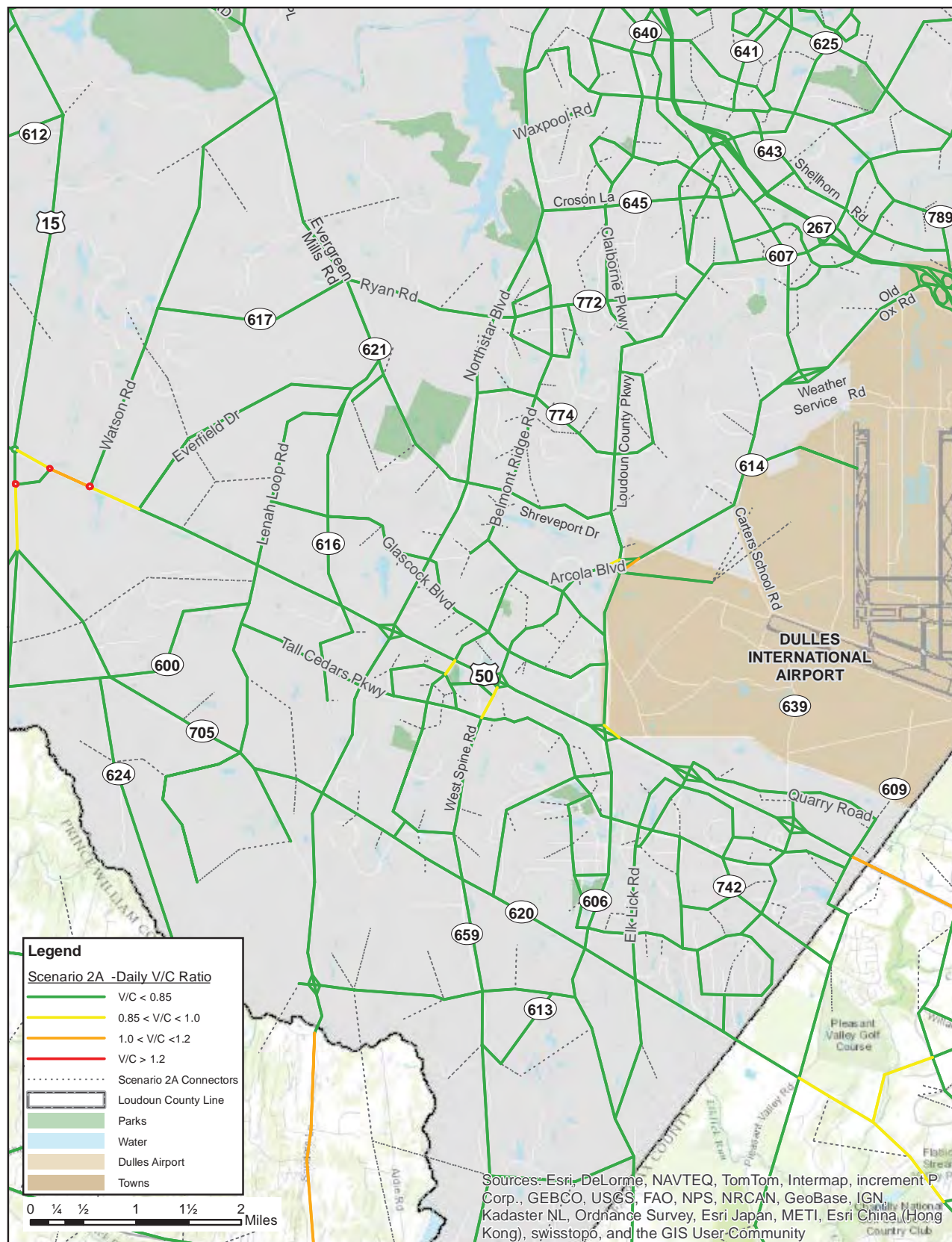


Scenario 2 - Daily V/C Ratios



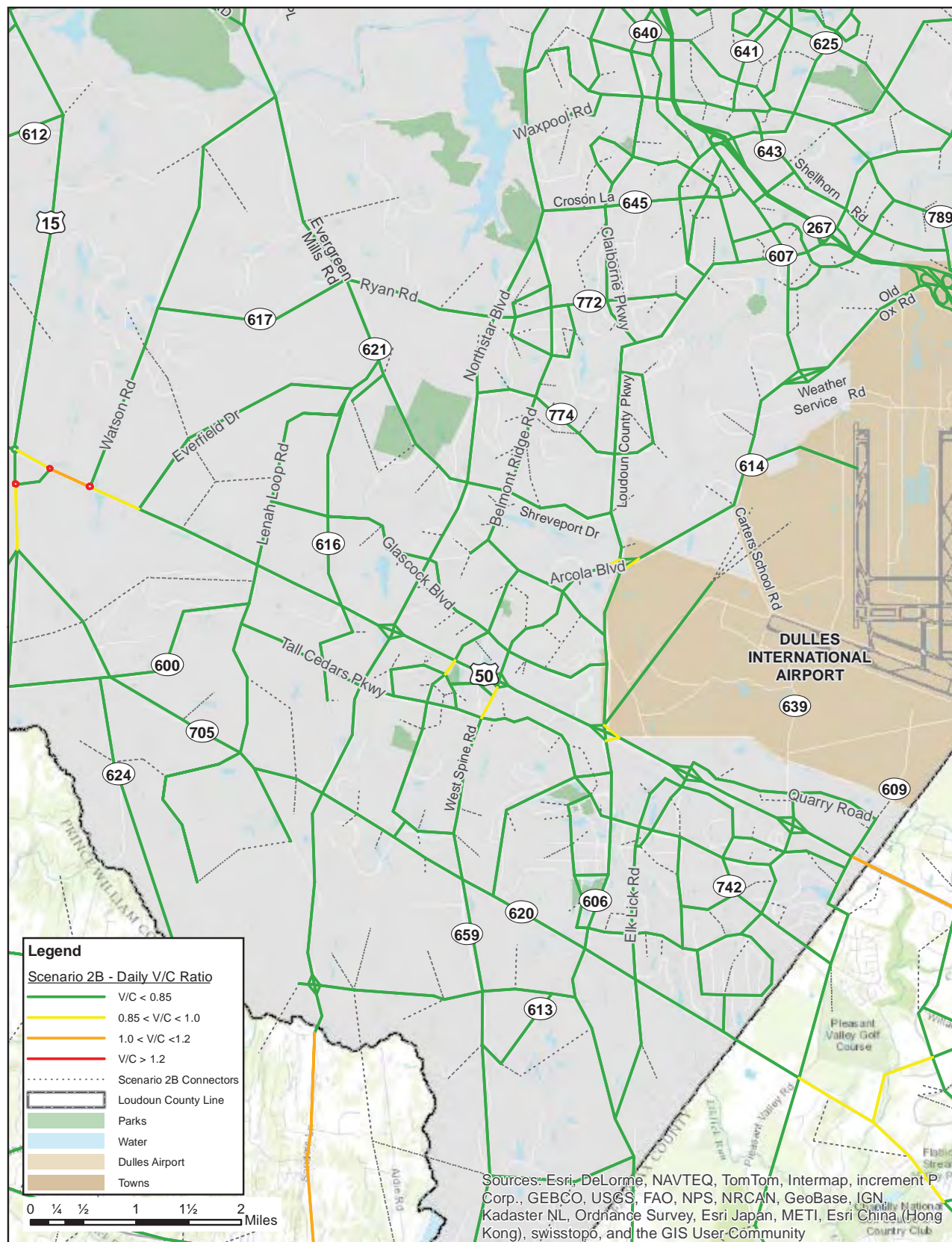


Scenario 2A - Daily V/C Ratios



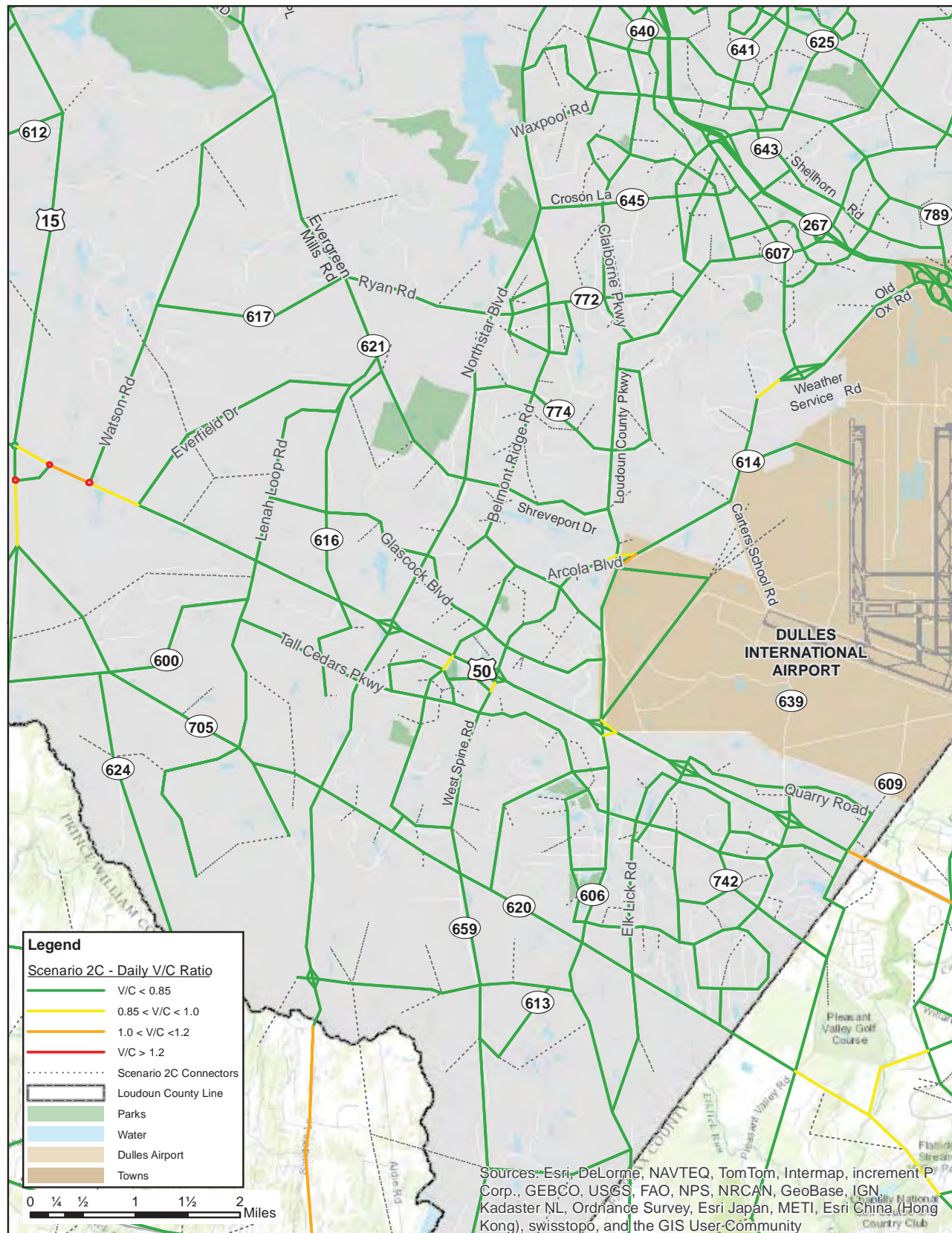


Scenario 2B - Daily V/C Ratios





Scenario 2C - Daily V/C Ratios



Legend

Scenario 2D - Daily V/C Ratio

- V/C < 0.85
- 0.85 < V/C < 1.0
- 1.0 < V/C < 1.2
- V/C > 1.2

Scenario 2D Connectors

Loudoun County Line

Parks

Water

Dulles Airport

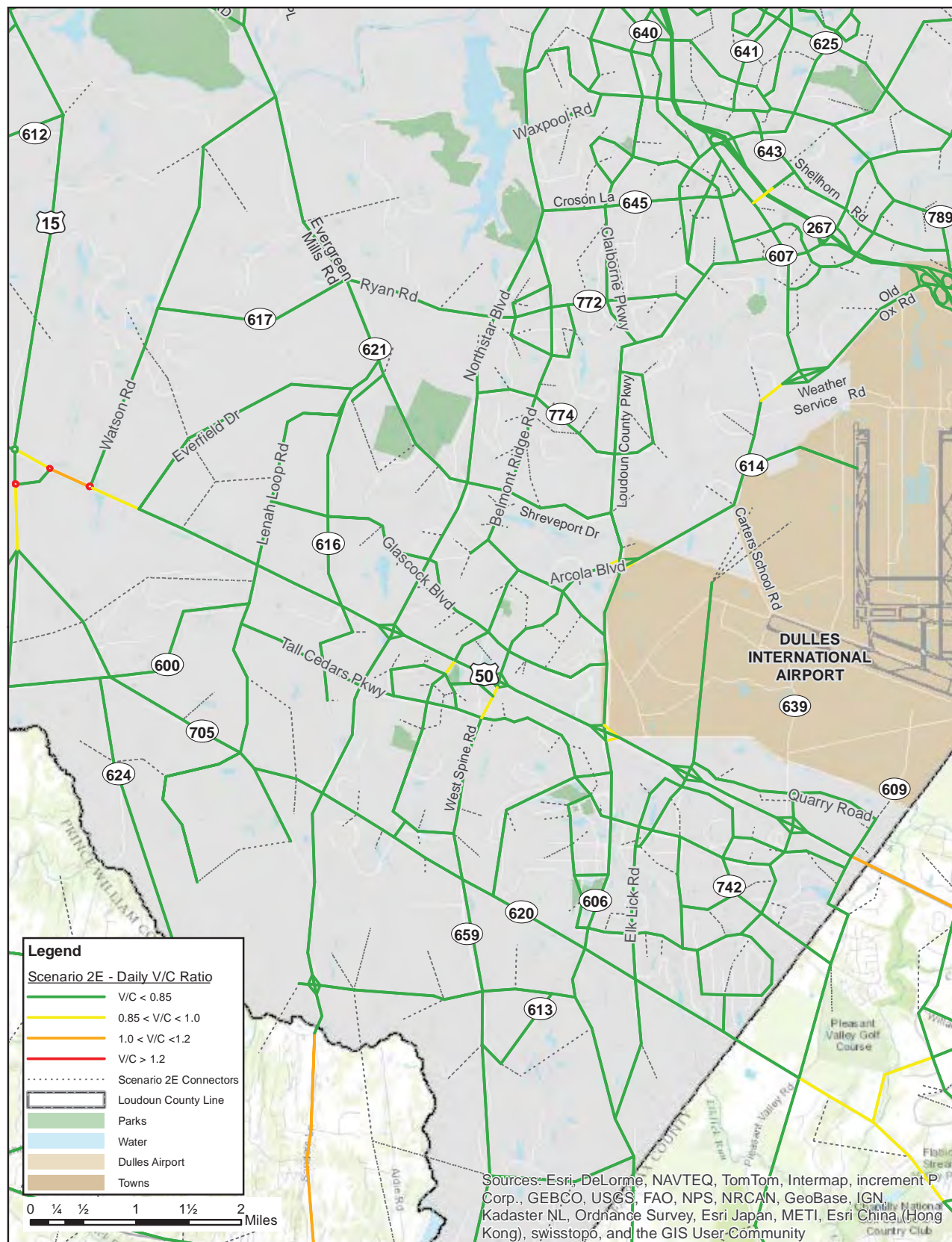
Towns

0 1/4 1/2 1 1 1/2 2 Miles

Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community



Scenario 2E - Daily V/C Ratios



Legend

Scenario 2F - Daily V/C Ratio

- V/C < 0.85
- 0.85 < V/C < 1.0
- 1.0 < V/C < 1.2
- V/C > 1.2

Scenario 2F Connectors

Loudoun County Line

Parks

Water

Dulles Airport

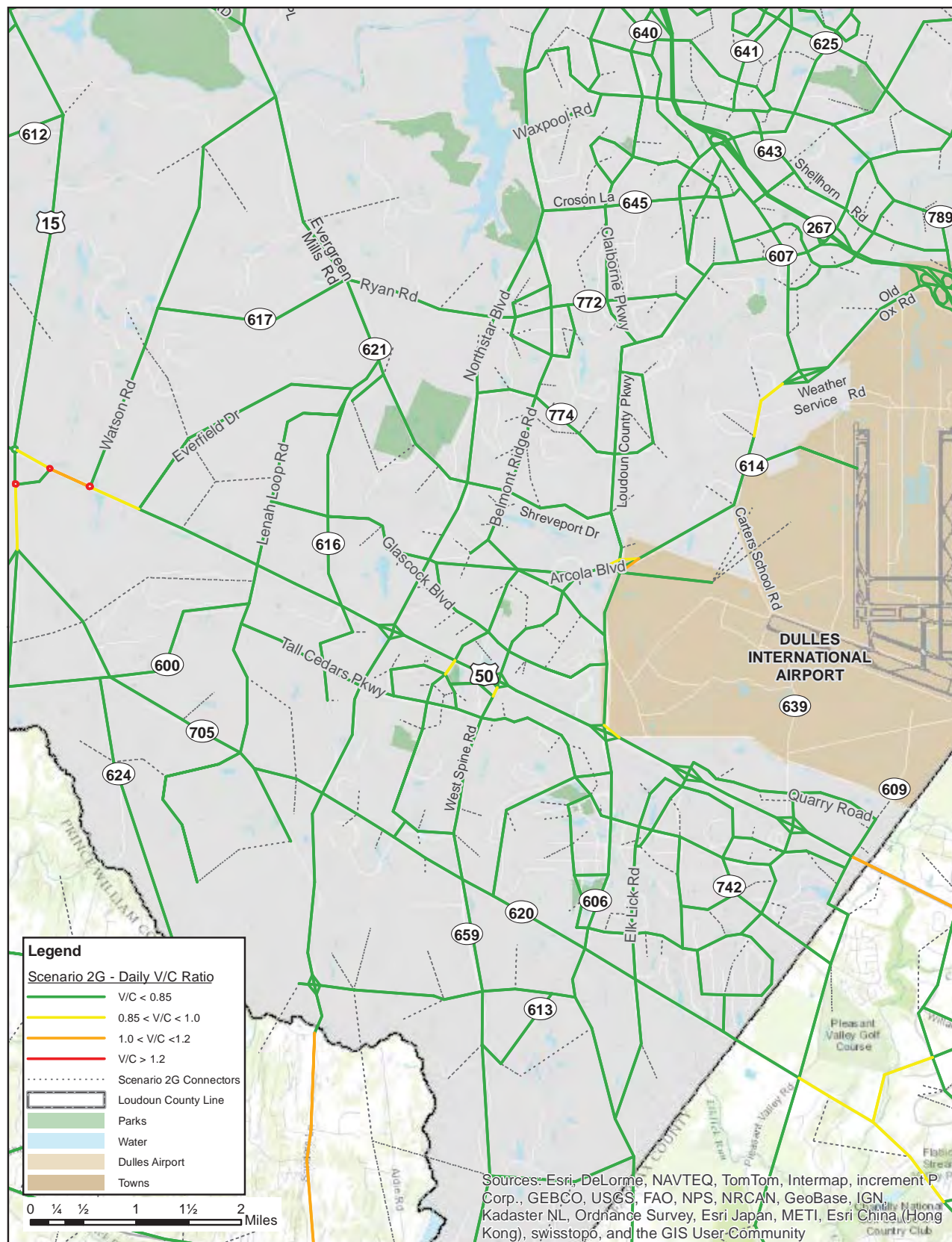
Towns

0 ¼ ½ 1 1½ 2 Miles

Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

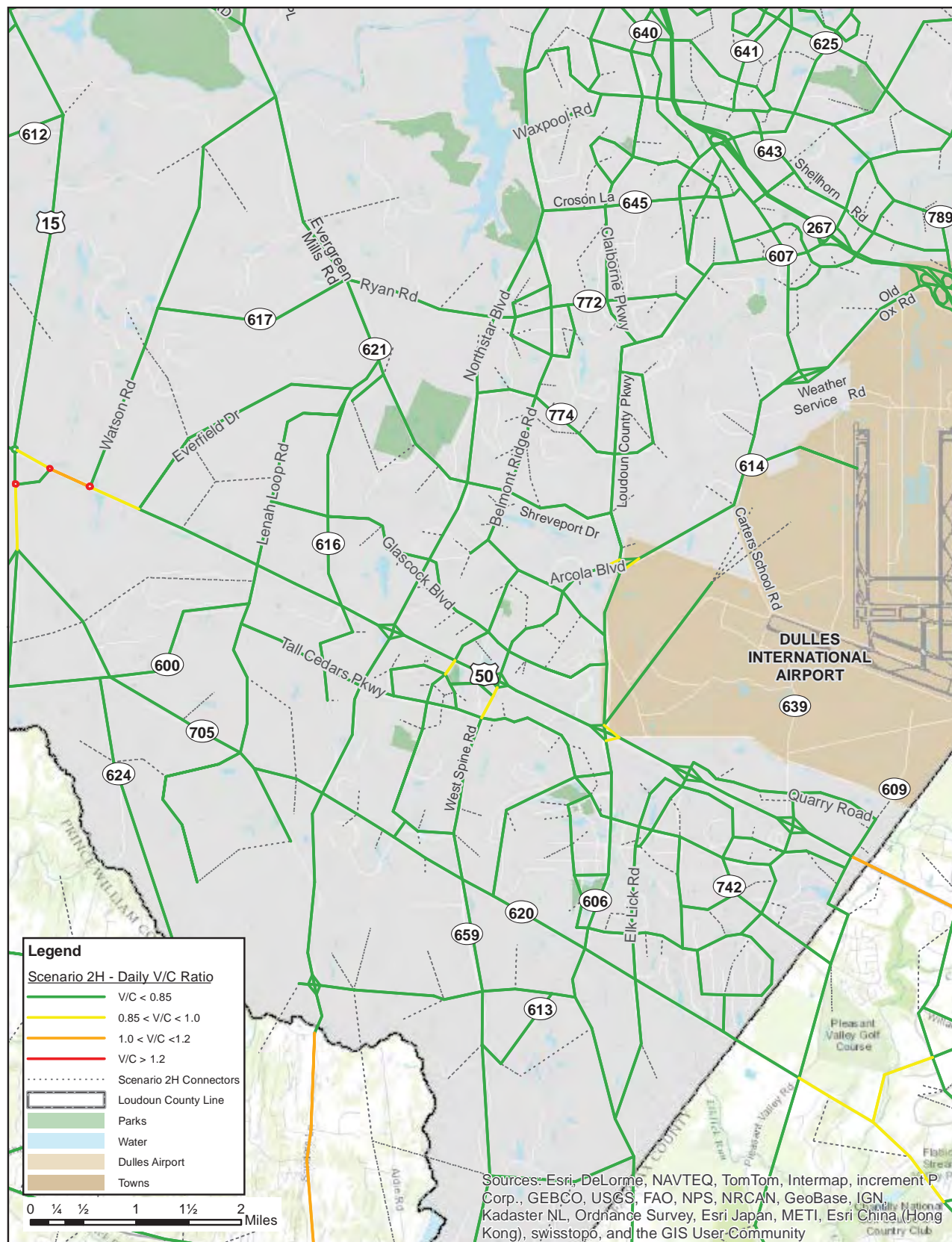


Scenario 2G - Daily V/C Ratios





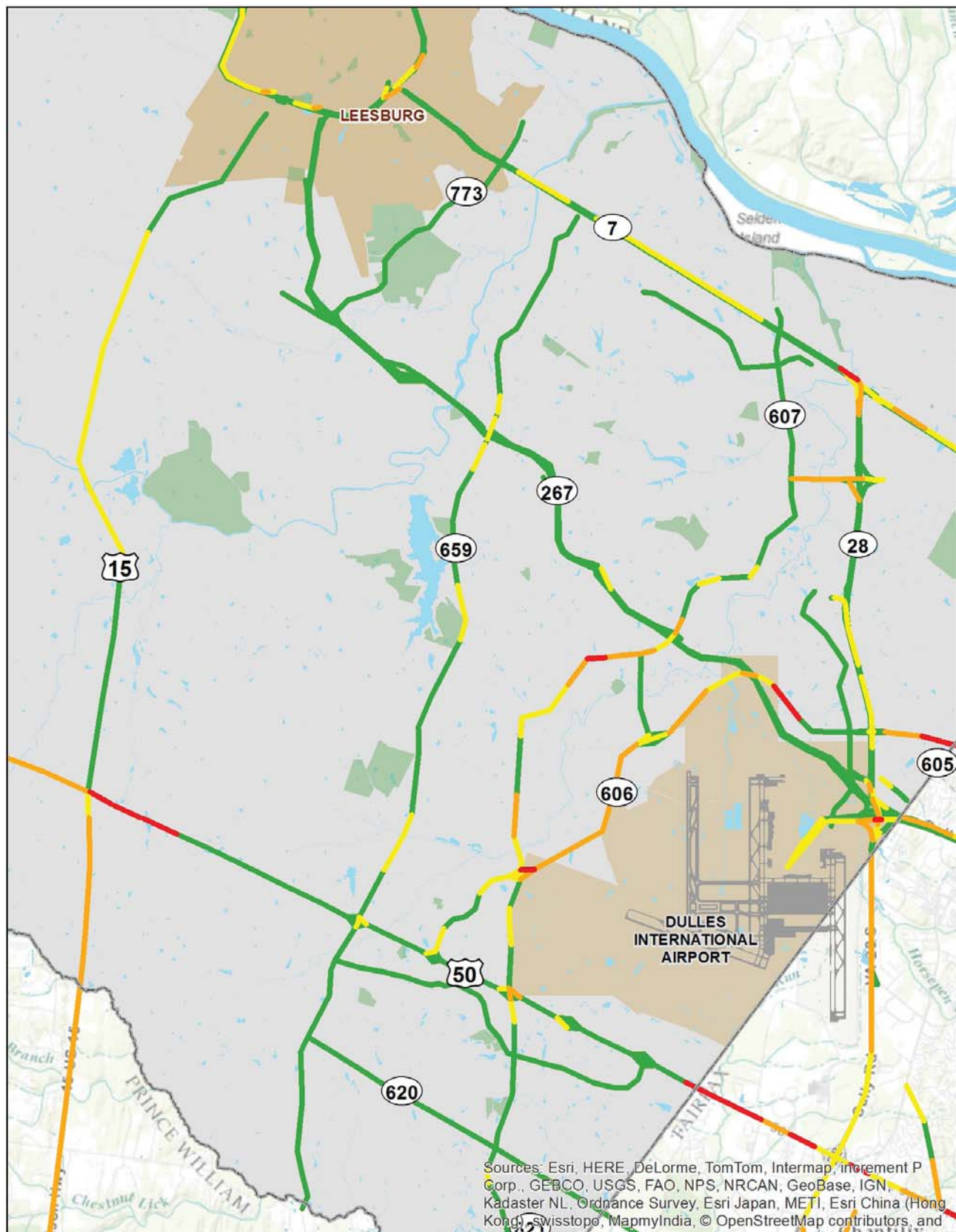
Scenario 2H - Daily V/C Ratios



Appendix D

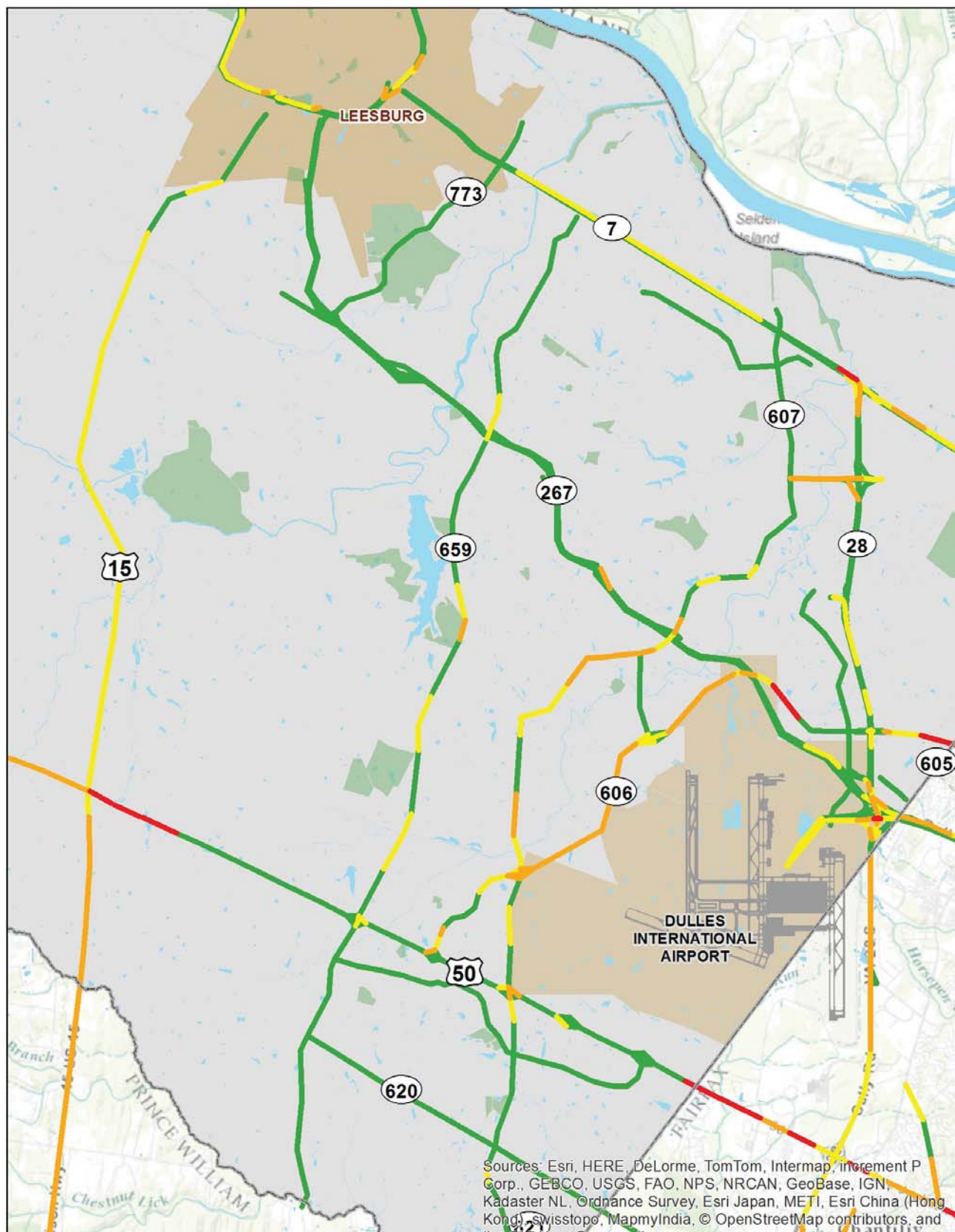


Scenario 1 - PM Peak Hour V/C Ratios



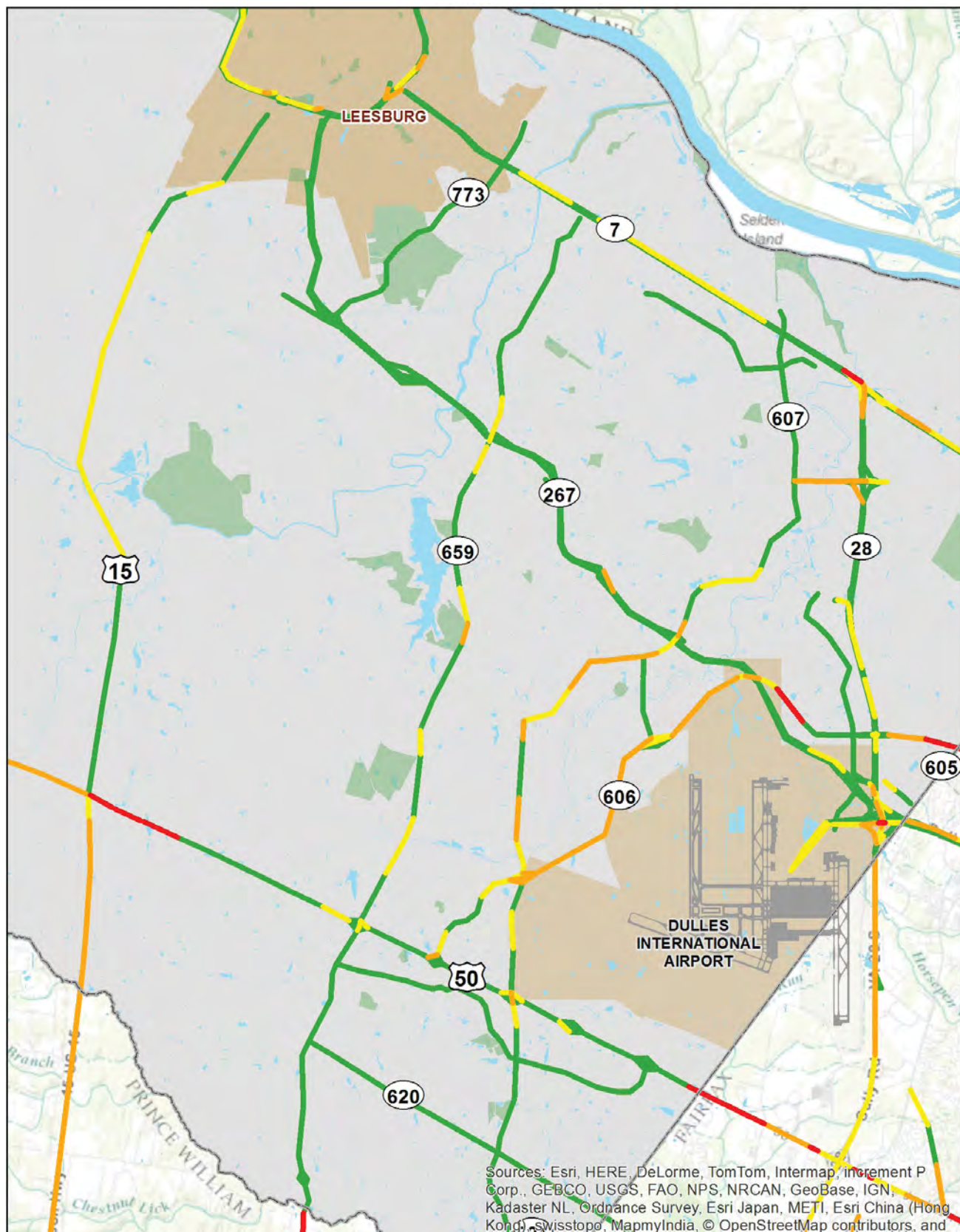


Scenario 1A: - PM Peak Hour V/C Ratios



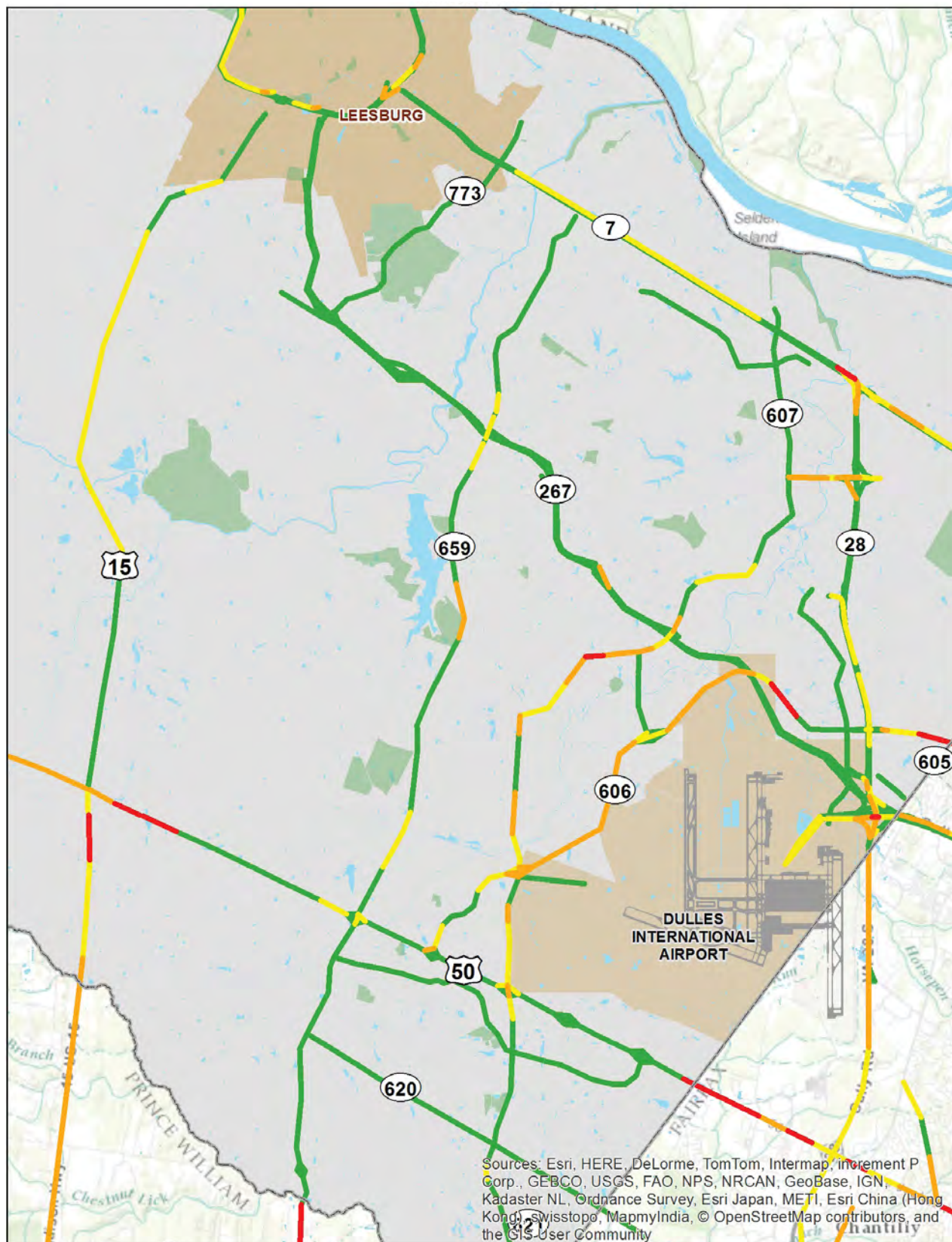


Scenario 2 - PM Peak Hour V/C Ratios



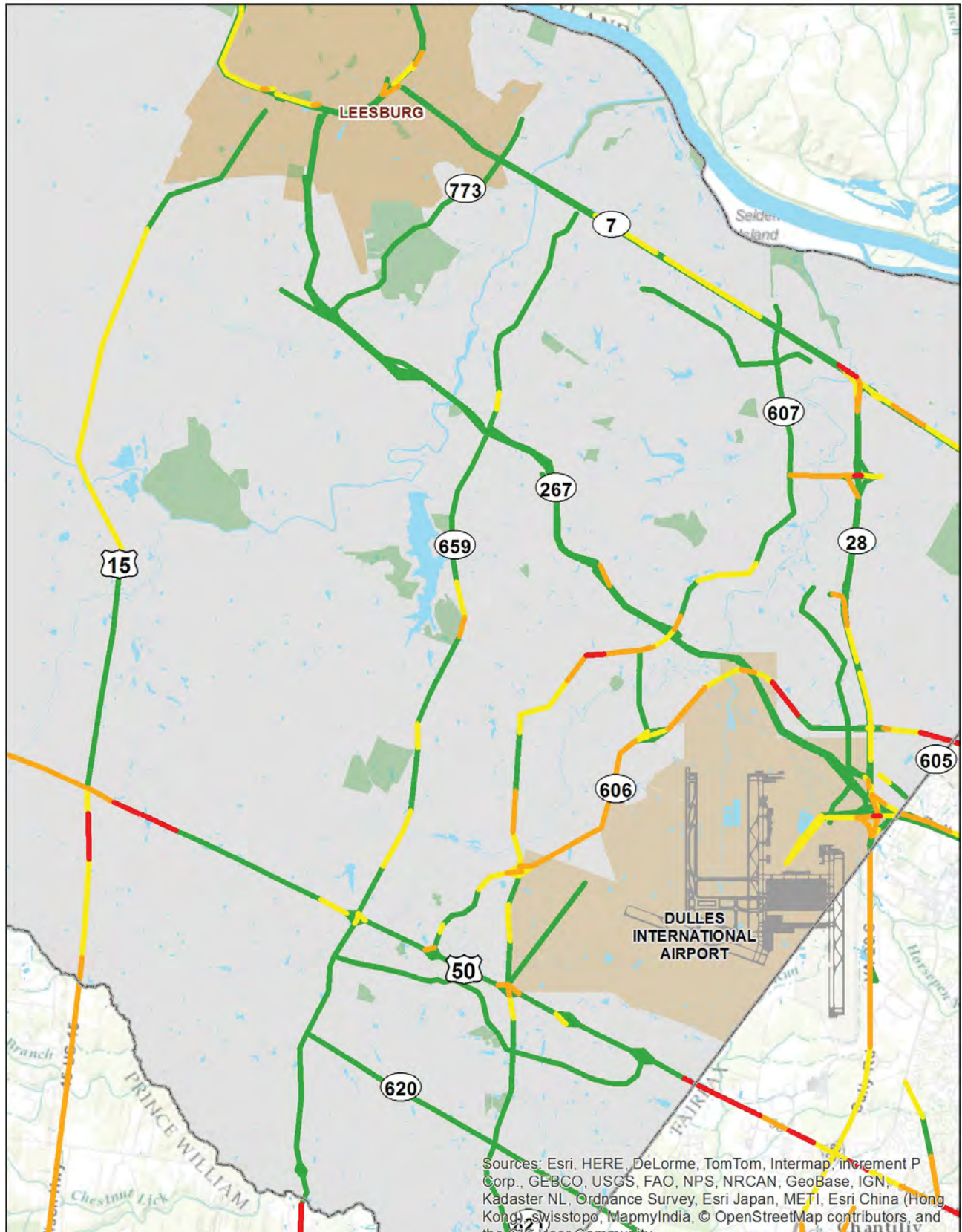


Scenario 2A - PM Peak Hour V/C Ratios



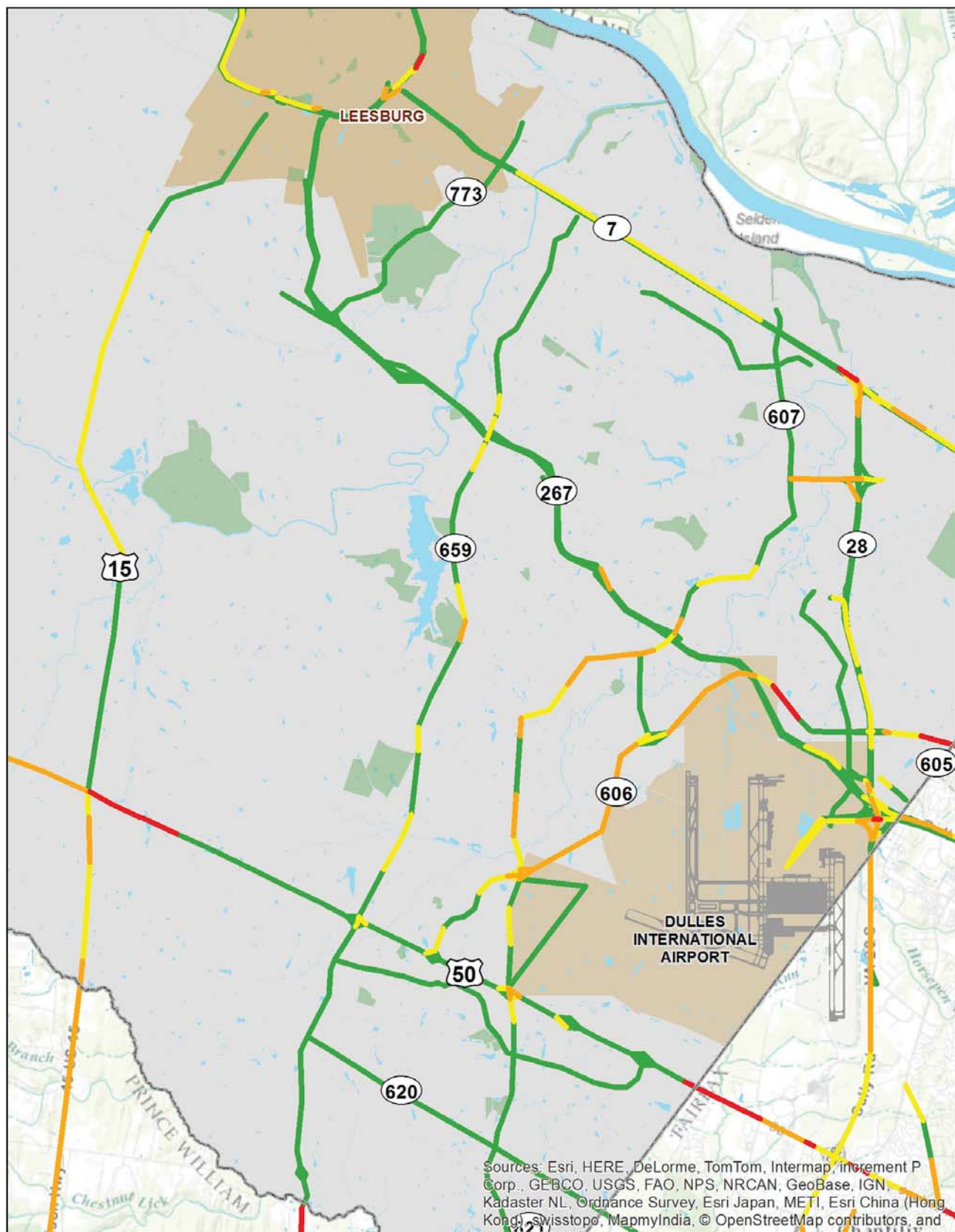


Scenario 2B - PM Peak Hour V/C Ratios



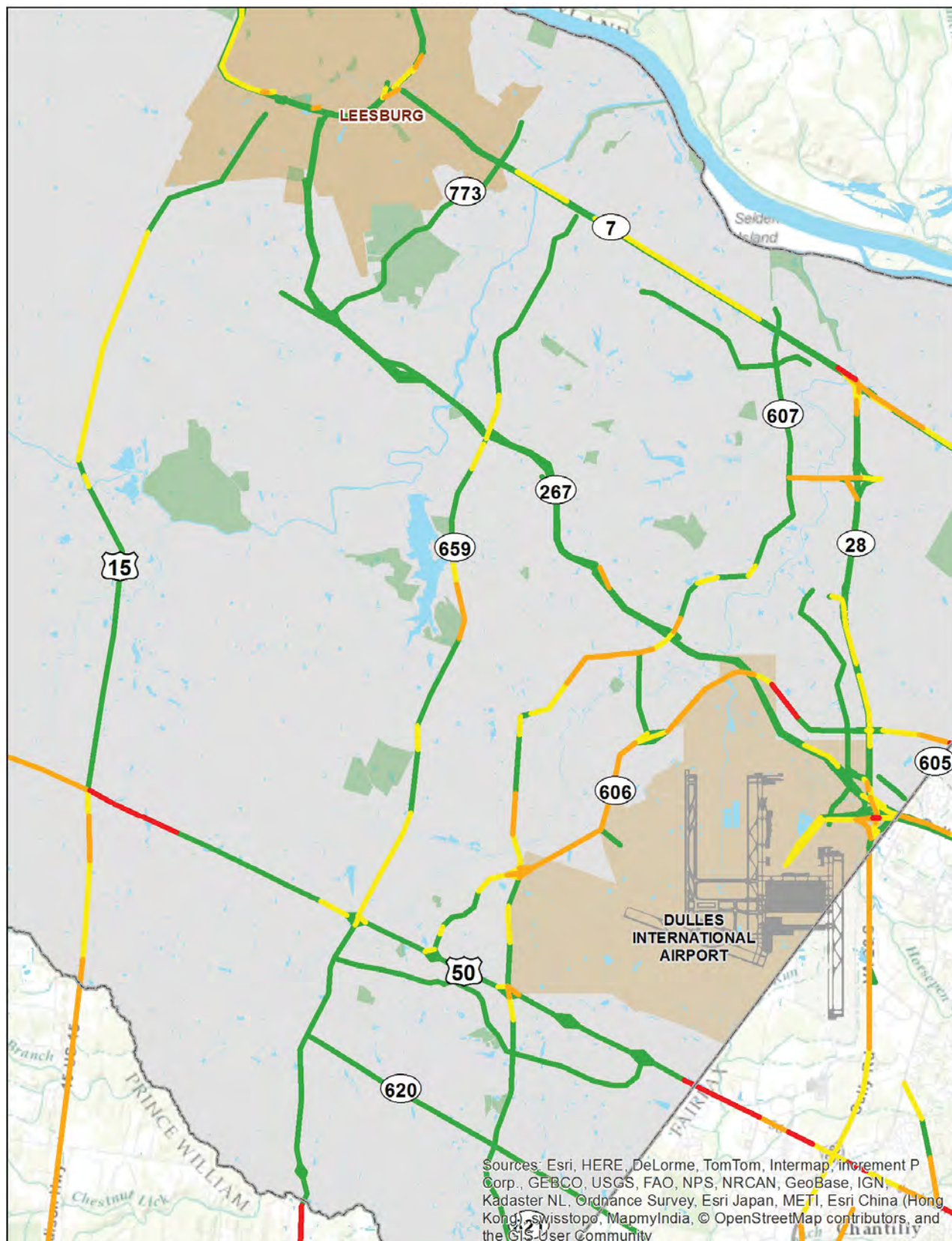


Scenario 2C - PM Peak Hour V/C Ratios



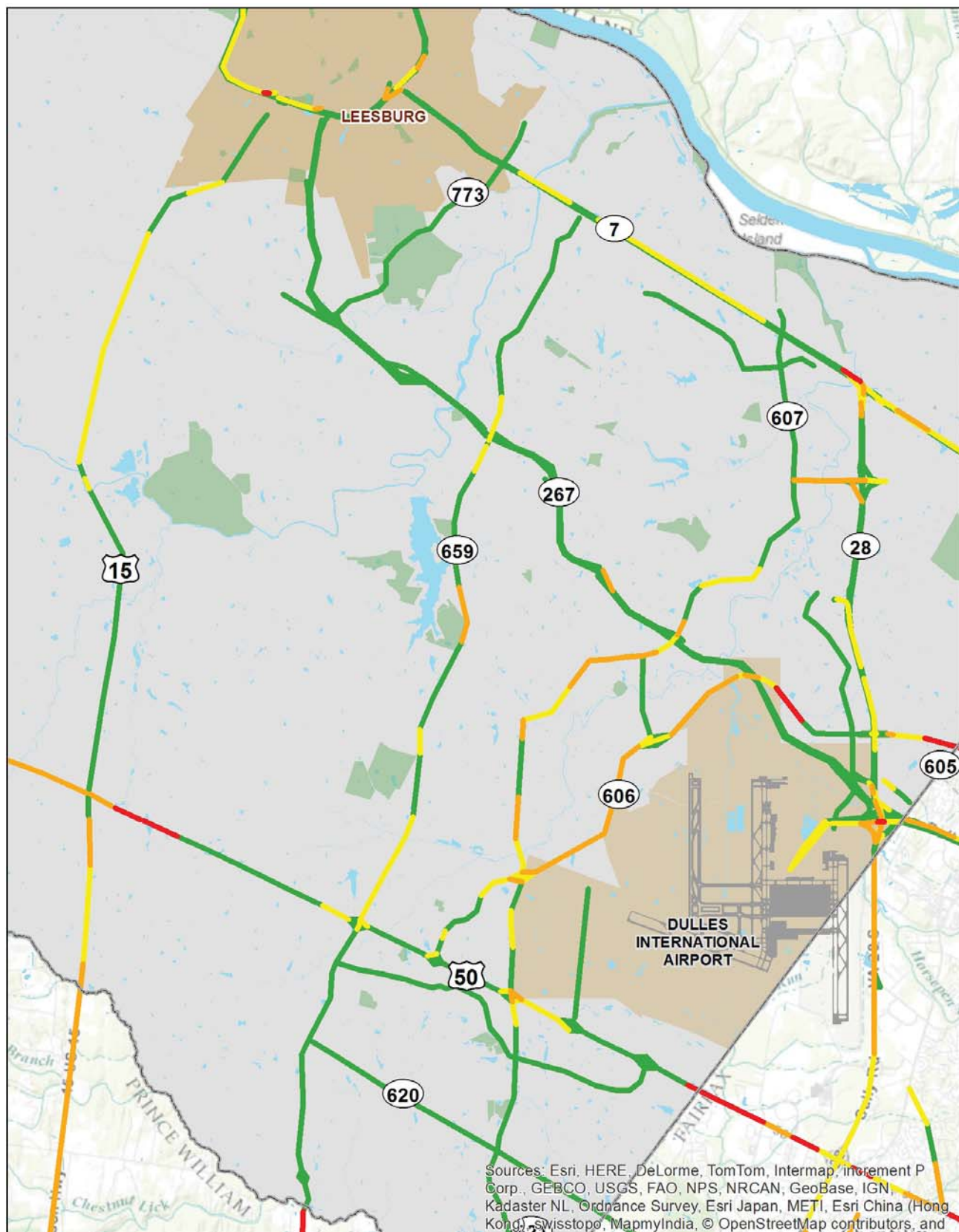


Scenario 2D - PM Peak Hour V/C Ratios



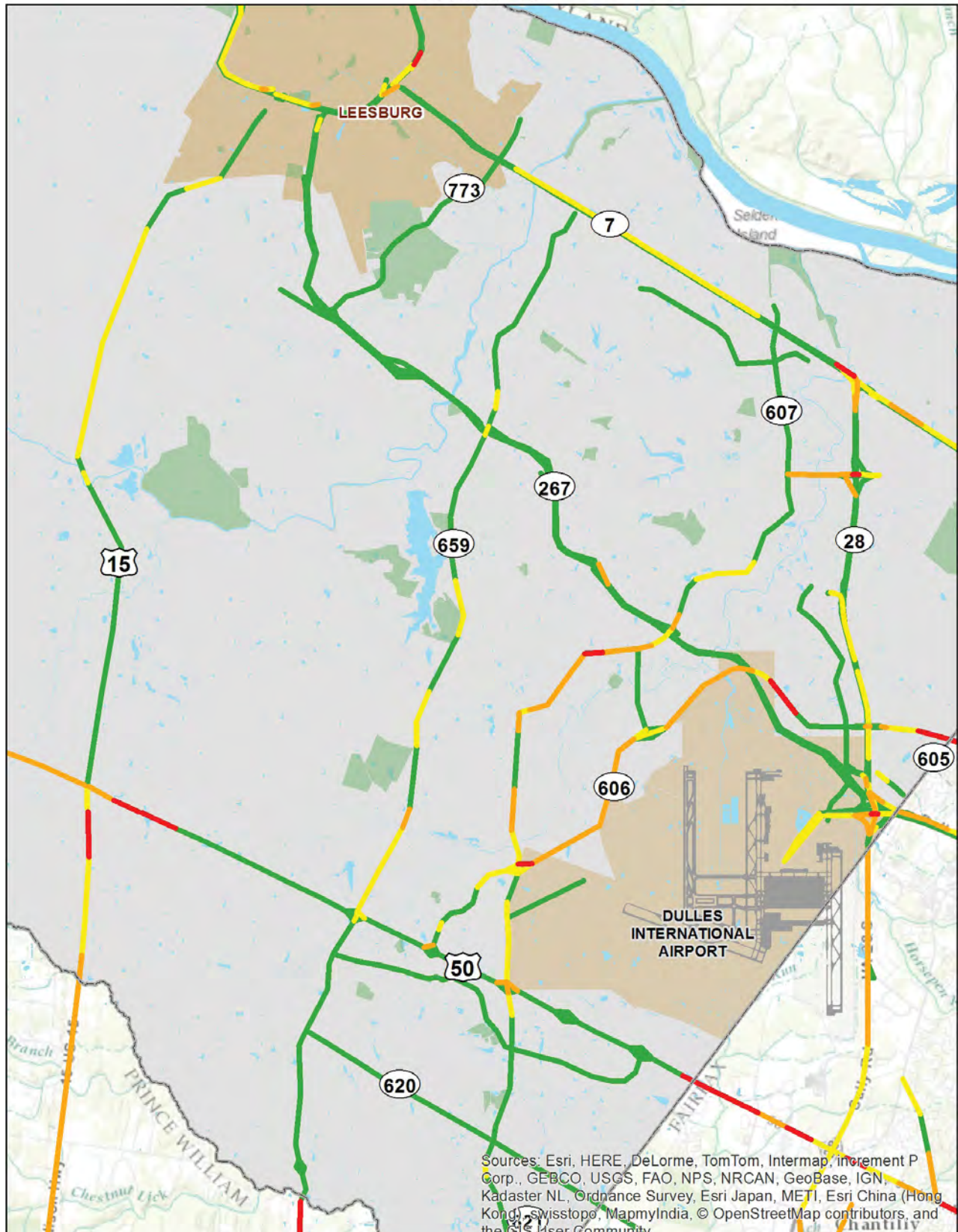


Scenario 2E - PM Peak Hour V/C Ratios



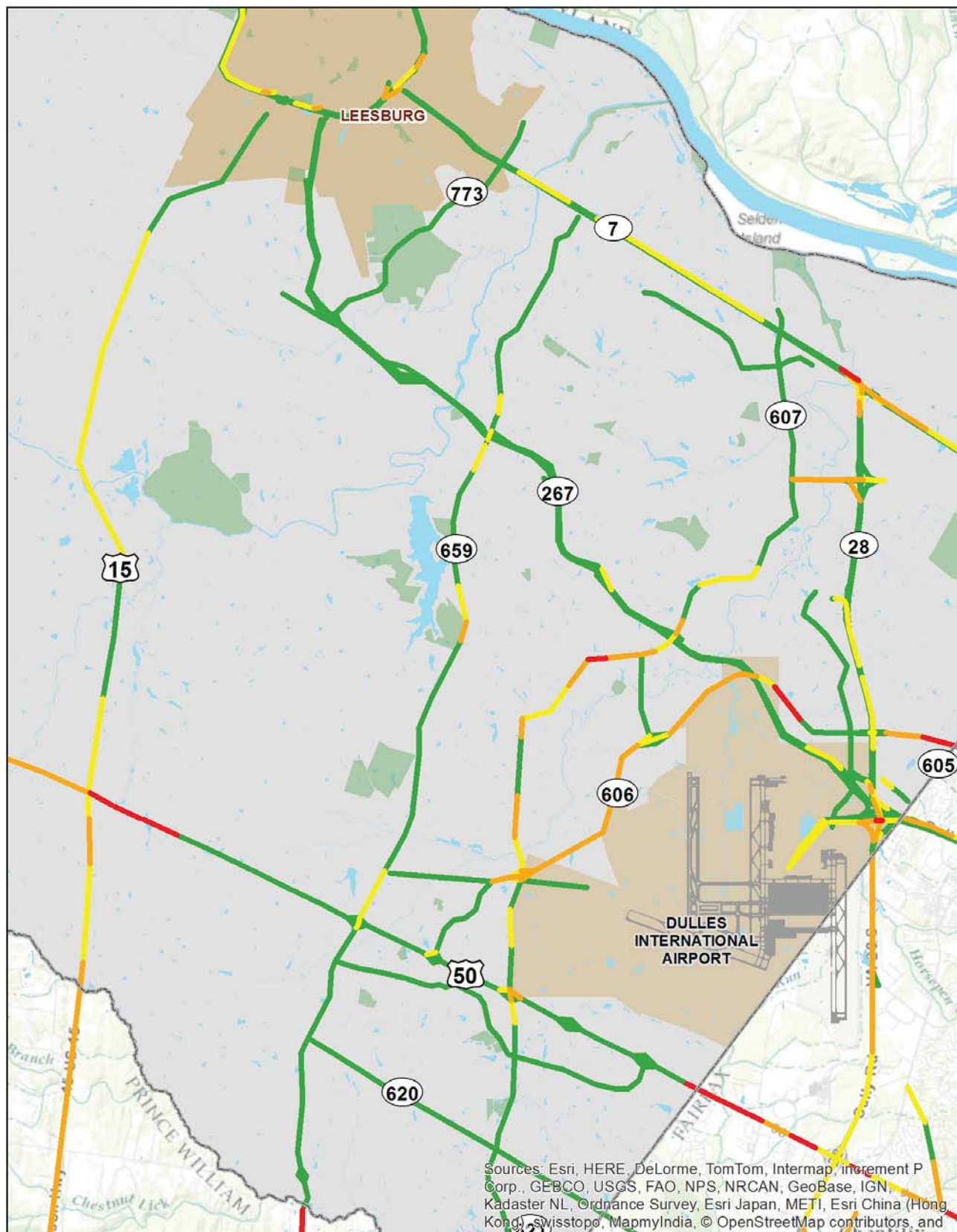


Scenario 2F - PM Peak Hour V/C Ratios



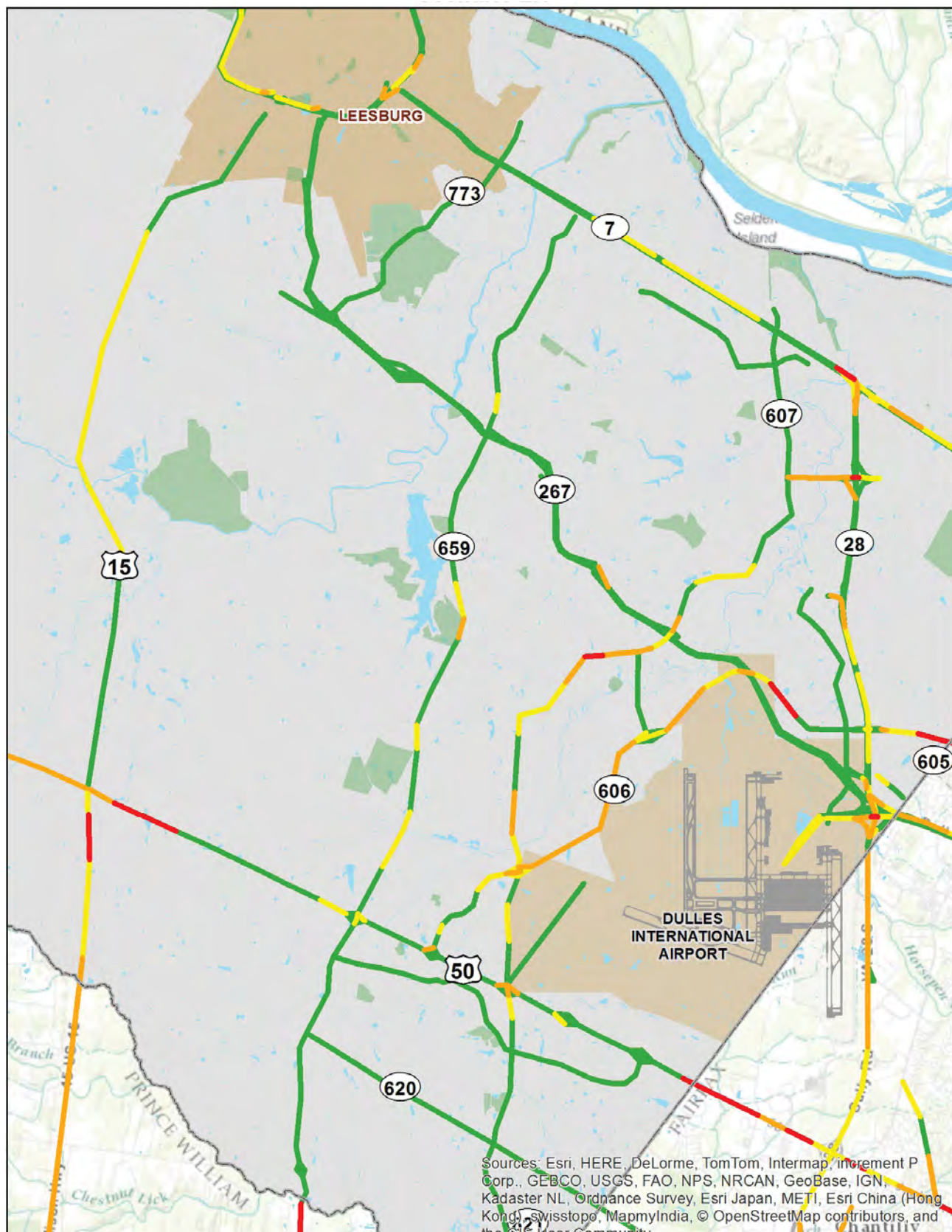


Scenario 2G - PM Peak Hour V/C Ratios





Scenario 2H - PM Peak Hour V/C Ratios



Western Dulles Access Study

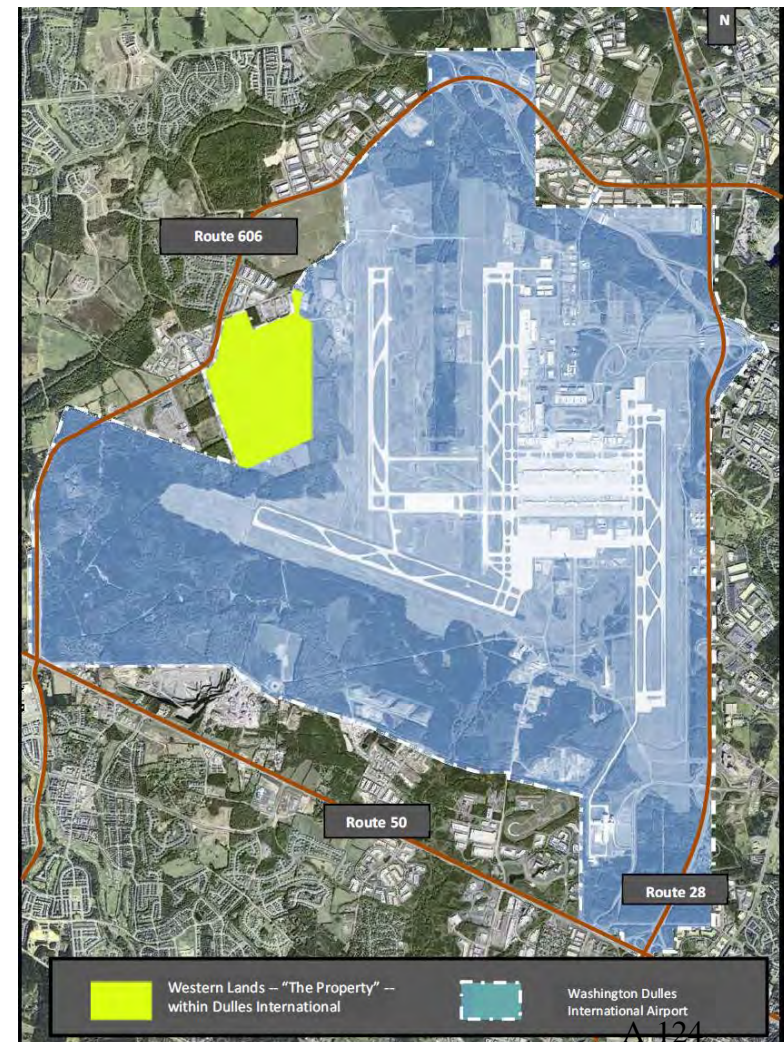
Presentation of Findings
To Loudoun County Board of Supervisors

Business Meeting
May 20, 2015



Purpose of the Study

- The purpose of the County study was to independently evaluate the adequacy of the Countywide Transportation Plan (CTP) to serve the development of the Western Lands (owned by MWAA)
- Significant differences between VDOT and County studies precludes direct comparison of results



Background (influenced the need for the study)

- Bi-County Parkway (established regional connectivity between I-66 and US 50)
- North-South Corridor (emerged as a corridor of statewide significance providing regional connectivity from I-95 to Route 7 utilizing the Bi-County Parkway)
- Western Dulles Access Road (introduced in 2014 as part of a VDOT study looking at the North-South Corridor including a draft Environmental Assessment)
- HB2 (Active legislation that will require any new state funded transportation project to go through prioritization, effectively putting all the above on hold)
- Loudoun County Board Business Meeting June 18, 2014, directed staff to conduct this current study



Western Land Use

- MWAA/VDOT land use projections
 - ~10,000 employees in western lands
 - ~6 million ft² of development (air cargo, air support, general aviation, non-residential mixed use—biomedical, data center, general office, hotel conference center, retail)
- Loudoun County/MWCOG land use projections of record
 - ~5,000 employees in western lands
 - ~3 million ft² of development (air cargo, air support, general aviation)
- County Study Modeled both



Countywide Transportation Plan

- CTP assumes a 2040 build-out of the roadway network
 - Robust road network that is planned to serve this area including (highlights):
 - Widening Route 606 to a minimum of 6 lanes (limited access)
 - Constructing and widening Loudoun County Parkway to 6 lanes
 - Constructing Arcola Blvd. to 6 lanes
 - Completing Northstar Blvd. to 6 lanes
 - Improving US 50 to 6 lanes with limited access and northern and southern collector roads
 - Constructing Westwind Drive to 4 lanes
- VDOT environmental study at the time included roadway network in the area following FHWA requirement of only using roads in the constrained long-range plan (CLRP) for the region – a good portion of CTP roads planned in this area were not in the CLRP at that time
- Since that time – all CTP roads in this area are now in the CLRP (as of October 2014)



Scenarios Analyzed

- **Scenario 1** - CTP - with Western Lands land use from Loudoun County/MWCOG (~5,000 employees - ~3 M square feet)
 - **Scenario 1a** - CTP with Western Lands land use from MWAA/VDOT (~10,000 employees - ~6 M square feet)
- **Scenarios 2 (2a-h)** - CTP with only Loudoun County/MWCOG land use, includes limited access on Northstar Blvd (Bi-County Parkway)
 - **Scenarios 2a-e** – with various access locations to airport western lands
 - **Scenario 2f** – with Evergreen Mills Road connected to Northstar Blvd. and extended to Dulles International Airport (IAD)
 - **Scenario 2g** – with new road from Dulles West Blvd (aka Glascock Blvd.) to Arcola Blvd. to the IAD
 - **Scenario 2h** – with CTP planned limited access US 50 from Northstar Blvd. to future Rt. 606/US 50 interchange with IAD access from the interchange



Sensitivity Analysis

- Growth of employees on Western Lands – the western land zones were increased by increments of 5,000 employees to determine how much growth influences the degradation of the CTP – the CTP begins to be negatively influenced at around a total of ~15,000 to 20,000 employees especially on Route 606
- Select link analysis done to look at network roads most influenced by connections into Dulles Airport western lands along Route 606 – Important roadway connections include:
 - Route 606
 - Westwind Drive
 - Loudoun County Parkway
 - US 50



Analysis Results

- **All scenarios adequately met traffic demand at full CTP build-out (2040) based on link volume/capacity ratios**
 - Difference between scenarios
 - Location of airport access along Rt. 606 shows little difference between scenarios
 - Airport access along US 50 improves conditions on Loudoun County Parkway and Route 606
 - Adding Evergreen Mills connection improves conditions on Tall Cedars Parkway and US 50
- **No need for additional east/west link as studied in EA**
- **US 50 does not need dedicated lanes for Airport traffic**



Recent MWAA activity on the Western Lands

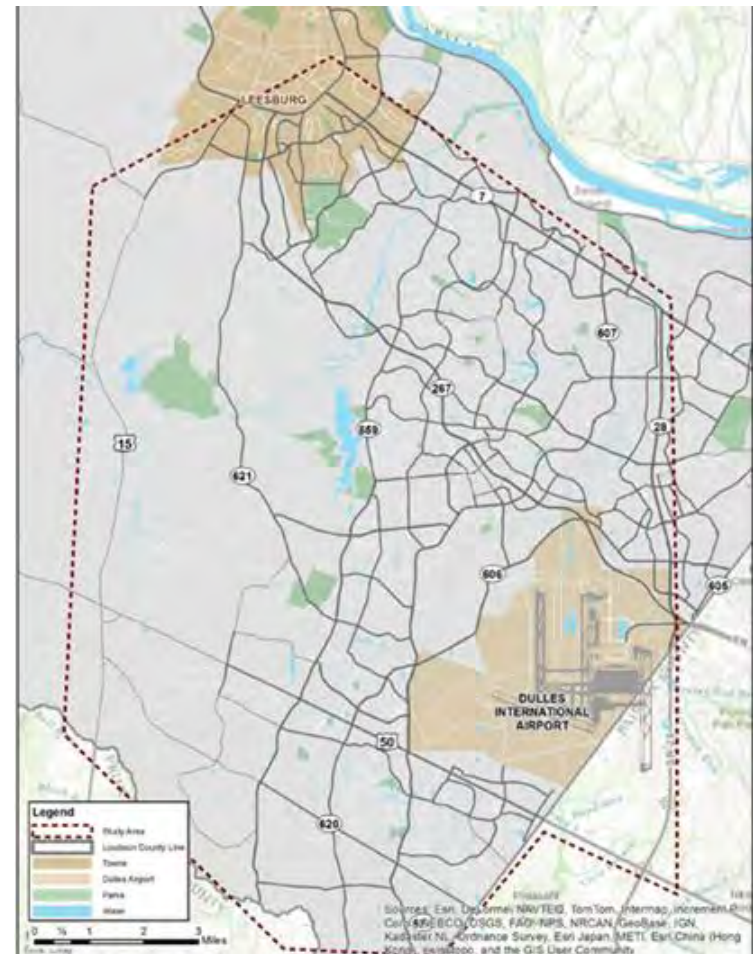
- MWAA Board in March 2015 incorporated Western Lands into IAD's Master Plan as "Non-Aviation Commercial"
- MWAA is currently actively planning for growth on the Western Lands. MWAA is:
 - coordinating with Loudoun County Staff
 - already developed and adopted policy and procedures to process unsolicited proposals
 - marketing the Western Lands for development
 - conducting an archeological study for the Western Lands
 - Preparing to do an Environmental Assessment (EA) of the Western Lands Fall 2015
 - FAA NEPA Procedures
 - Using generic PD-GI development assumptions



Thank You

- Bob Brown, DTCL
- Mike Harris, Kimley-Horn

Questions



Metropolitan Washington Airports Authority

Real Estate Development Policies

Policies and Procedures

Regarding

Unsolicited Proposals

for

Western Lands

at

Washington Dulles International Airport

March 3, 2015

Contents

FOREWORD

I.	INTRODUCTION.....	1
II.	PROCEDURES FOR THE SUBMISSION OF UNSOLICITED PROPOSALS	4
	A. Unsolicited Proposals	4
	B. Unsolicited Proposal Submissions	4
	C. Applicability of Other Laws	6
III.	PROCEDURES FOR THE REVIEW, EVALUATION AND COMPETING OF UNSOLICITED PROPOSALS.....	6
	A. Step 1 – Review of Unsolicited Proposal.....	7
	B. Step 2 – Competing the Unsolicited Proposal.....	7
	C. Step 3 – Negotiations and Approvals	9

ATTACHMENT 1 -- Suggested Content of *Conceptual Proposal* Submissions

ATTACHMENT 2 -- Suggested Content of *Detailed Proposal* Submissions

I. INTRODUCTION

The Metropolitan Washington Airports Authority (Authority) is a public body, corporate and politic, created in 1986 by joint legislation establishing an interstate compact between the Commonwealth of Virginia and the District of Columbia. As authorized by the Metropolitan Washington Airports Act of 1986, Ronald Reagan Washington National (Reagan National) and Washington Dulles International Airports (Dulles International) have been leased to the Authority by the United States.

The Authority's mission is to develop, promote, and operate Reagan National and Dulles International Airports. The Authority also operates the Dulles Toll Road and is responsible for the construction of the Metrorail Silver Line. The Authority is governed by a Board of Directors (Board) consisting of seven members appointed by the Governor of Virginia, four members appointed by the Mayor of the District of Columbia, three members appointed by the Governor of Maryland, and three members appointed by the President of the United States. The Authority is not a federal agency.

To accomplish its mission, the Authority enters into a wide range of business agreements and partnerships to generate revenue that offsets the cost of operation, maintenance and capital improvements at its airports. Dulles International land offers a major opportunity toward the Authority's goals for revenue enhancement and diversification. This *Policies and Procedures Regarding Unsolicited Proposals for Western Lands* (Policy) describes the process for the submission of unsolicited real estate proposals for the portion of Dulles International consisting of Authority-owned property known as Western Lands (Property), shown on Figures 1 and 2, and for the Authority's review of such proposals. Proposals could offer long-term ground leasing or sale of all or portions of the Property.

The Property is not part of the approximately 11,000 acres at Dulles International that the Authority leases from the federal government. Since the Authority took control of Dulles International in 1987, it has purchased approximately 1,575 acres of land on the northwest side of Dulles. About 1,149 of these purchased acres have been used for the construction of a new, third north-south runway, which was completed and opened in 2008. The Property is comprised of the remaining 426 of the purchased acres, which are located at the western boundary of Dulles International along Route 606.

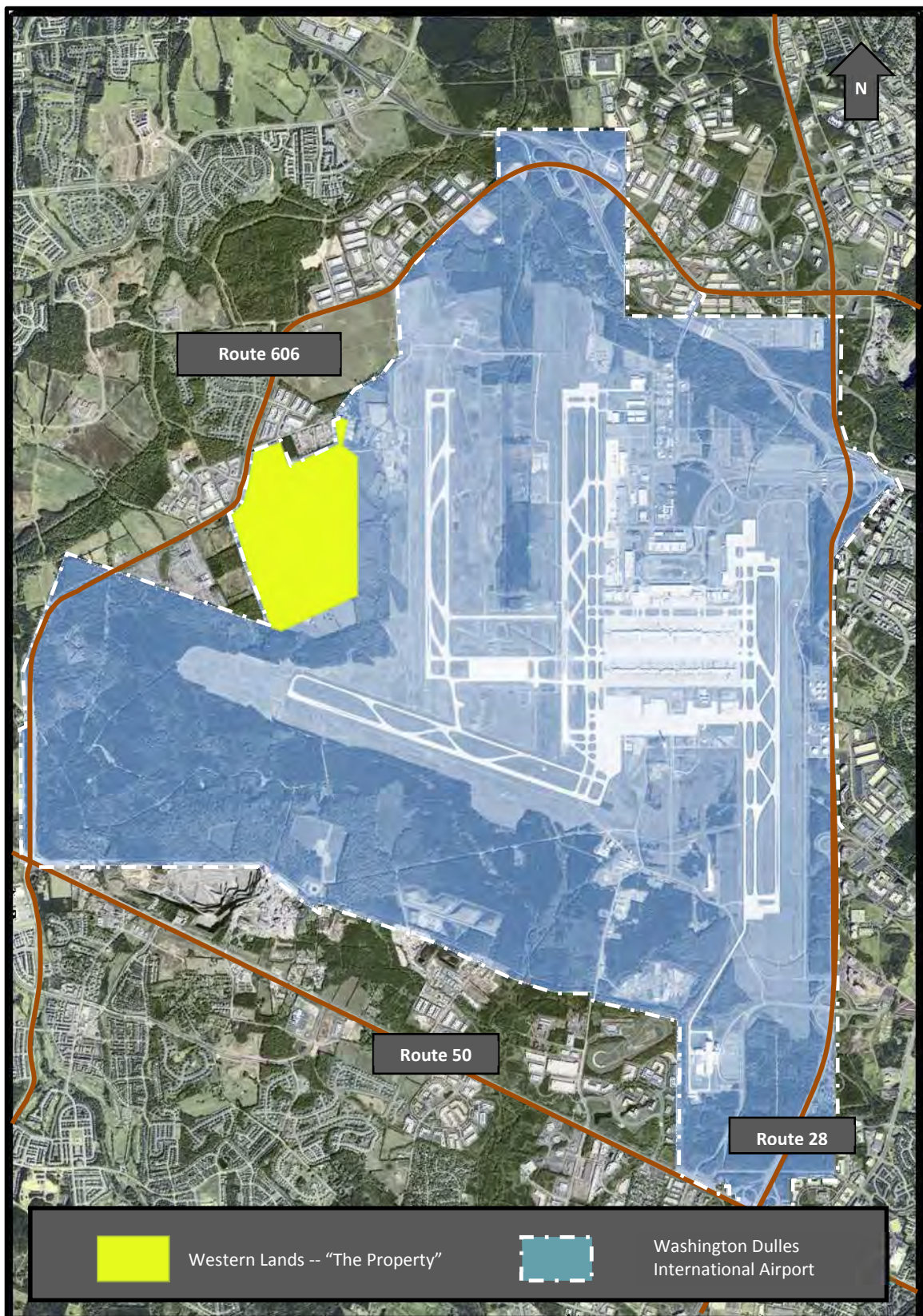


Figure 1 -- Airports Authority Property at Washington Dulles International Airport

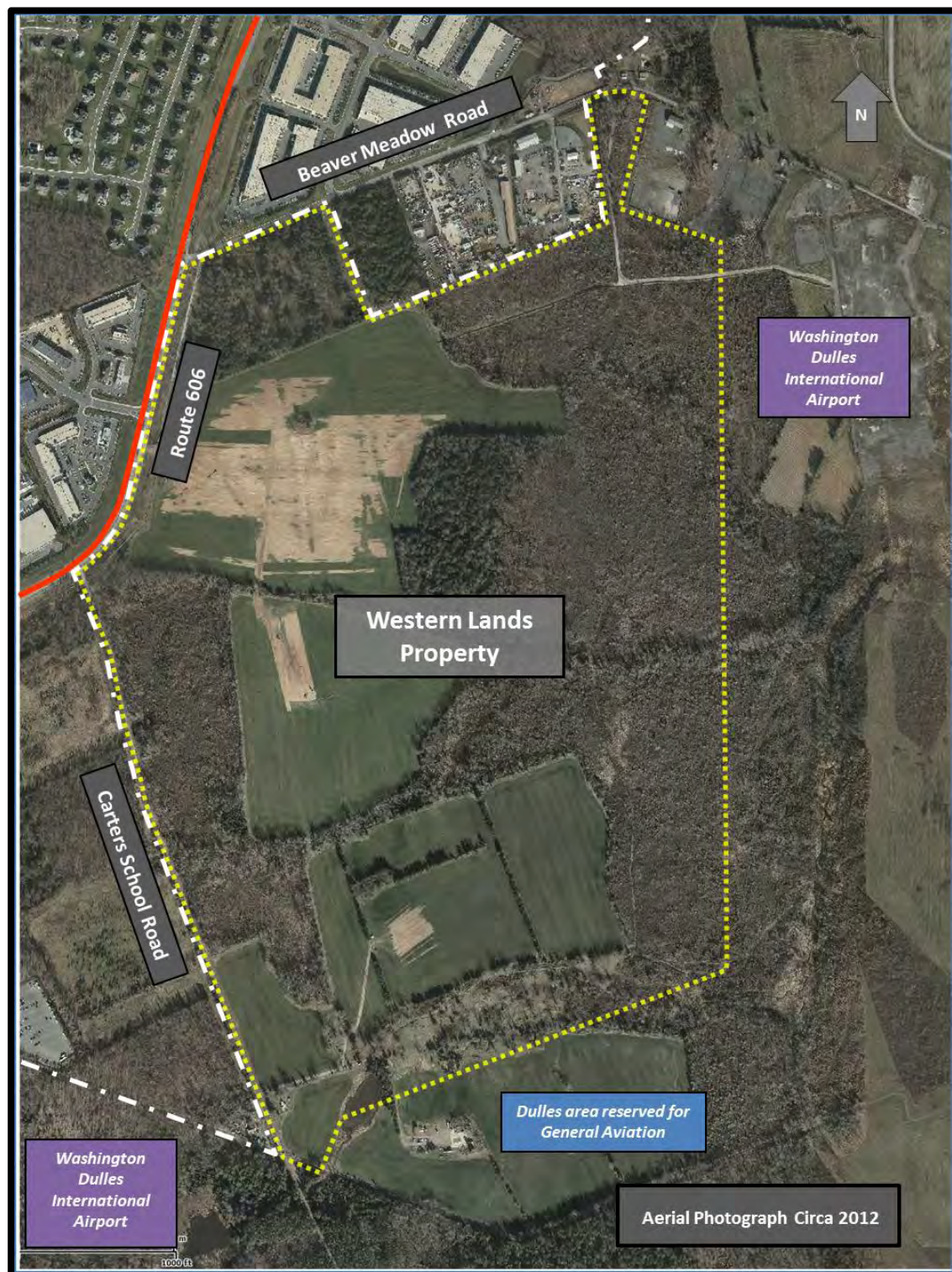


Figure 2 -- Enlarged View of the Property

Although located in Loudoun County, the County’s zoning designations for the Property (Planned Development – General Industrial or PD-GI) do not apply as long as the land is owned by the Authority. Currently, the Dulles International Master Plan does not define or designate a land use for the Property. The airport land immediately southeast of the Property has been for General Aviation activities. Although the Property is not directly subject to terms of the Authority’s lease with the federal government, if the lease is not extended beyond its current expiration date of June 6, 2067, title to any unsold portion of the Property would pass to the United States government at that time.

II. PROCEDURES FOR THE SUBMISSION OF UNSOLICITED PROPOSALS

A. Unsolicited Proposals

Unsolicited proposals for the Property are defined to be proposals for the long-term lease or sale of the Property submitted to the Authority that are not in response to any solicitation issued by the Authority (Unsolicited Proposals). The Authority invites Unsolicited Proposals for both non-aviation uses and aviation uses of the Property, the latter uses consisting of second-line aviation support activities such as freight forwarders and consolidators, which typically are able to be located “off-airport.” Unsolicited proposals may be based on the Authority’s interests, needs and goals, as described in public materials. On the other hand, parties interested in preparing an Unsolicited Proposal may see opportunities for development of the Property that are not addressed in Authority materials and that may be beneficial to the Authority. Parties submitting an Unsolicited Proposal will bear all costs and expenses associated with the preparation of their Unsolicited Proposals.

B. Unsolicited Proposal Submissions

Unsolicited Proposals should be submitted in two parts, to include a *Conceptual Proposal* and a *Detailed Proposal*. The *Conceptual Proposal* should provide general information about the Proposer’s qualifications and experience, the major characteristics of the proposed development, the project financing, anticipated public support or opposition, and project benefits and compatibility. Further suggestions about the content of a *Conceptual Proposal* are provided in Attachment 1. If, pursuant to the procedures described below in Section III, the Authority accepts a *Conceptual Proposal* for further consideration and issues an invitation for Competing Unsolicited Proposals, the *Conceptual Proposal* will be posted for public viewing. Therefore, confidential or proprietary information should not be included in a Proposer’s *Conceptual Proposal*.

The *Detailed Proposal*, which is to be submitted with the *Conceptual Proposal*, should provide further detail on the scope of the project, feasibility and risk analyses, relevant proprietary or confidential information, and cost estimates that support the viability of the Proposal. The *Detailed Proposal* will not be posted for public viewing. Suggested content for the *Detailed Proposal* is provided in Attachment 2.

If confidential or proprietary information is included in the *Detailed Proposal*, it should be appropriately marked in accordance with the Authority's Freedom of Information Policy. The Authority will withhold and protect such information from public disclosure, to the extent allowed by the Freedom of Information Policy, which can be found on the Authority's website at [http://www.mwaa.com/file/Freedom of Information Policy.pdf](http://www.mwaa.com/file/Freedom%20of%20Information%20Policy.pdf).

In order for the Authority to consider an Unsolicited Proposal, a Proposer must submit two fees: (1) a non-refundable Review Fee in the form of a certified or cashier's check payable to the "Metropolitan Washington Airports Authority" in the amount of \$5,000, which must be submitted with the *Conceptual Proposal* (Review Fee), and (2) a Proposal Fee in the form of a certified or cashier's check or irrevocable letter of credit in an amount equal to the smaller of \$50,000 or one-half of one percent (0.5%) of the Proposer's estimated constructed cost of the proposed project which must be submitted with the *Detailed Proposal* (Proposal Fee). The Proposal Fee will be refunded to those Proposers who are not selected when: (1) a contract has been executed with another Proposer, or (2) the Authority announces it is terminating the specific Unsolicited Competing Proposals process without a selection.

One copy of each of the *Conceptual* and *Detailed* parts of the Unsolicited Proposal must be marked as "Signature Copy" and should contain any documents with original signatures, along with the fees previously described. This copy, together with seven additional printed copies and one electronic copy, should be submitted to the Authority's at the address below.

The *Detailed Proposal* (the "Signature Copy," seven reproduced copies, and an electronic copy) must be submitted in a sealed envelope or box, labeled "*Detailed Proposals*," that is separate from the remainder of the submission.

The Unsolicited Proposal submission should be mailed, sent via delivery service, or hand-delivered to:

Western Lands – Unsolicited Proposal
c/o Department of Real Estate, Office of Revenue
Metropolitan Washington Airports Authority
1 Aviation Circle
Ronald Reagan Washington National Airport
Washington, D.C. 20001

C. Applicability of Other Laws

Development of the Property may be subject to various federal, state and local laws with which a successful proposal would need to comply, including the National Environmental Policy Act, and may require preparation of environmental review documents and analyses of the Proposal's impacts in accordance with Federal Aviation Administration (FAA) guidelines and directives.

**III. PROCEDURES FOR THE REVIEW, EVALUATION AND COMPETING OF
UNSOLICITED PROPOSALS**

The Authority will process Unsolicited Proposals for the development of the Property under the terms of this section. The Authority reserves the right to amend or modify the procedures in this section, and to reject any and all Unsolicited Proposals, at any time and in its sole discretion. Proposers bear all costs and expenses associated with their Unsolicited Proposal and the procedures outlined in this Section III.

Interested parties may submit an Unsolicited Proposal based on the Authority's interests, needs, and goals, as described in public materials. On the other hand, the Authority does not intend these materials to necessarily limit the nature or scope of development that might be proposed for the Property. Interested parties may see opportunities for development that are not addressed or reflected in the Authority's materials and that may represent viable uses of the Property which would benefit the Authority.

If the Authority believes an unsolicited proposal has merit, it will provide an opportunity for others to compete for the ability to purchase or lease the Property by undertaking one of two forms of open-competition:

- An invitation for Competing Unsolicited Proposals; or
- A formal advertisement for Solicited Proposals.

The Competing Unsolicited Proposals process typically will be pursued in situations where the Authority is faced with little risk or issue, does not need to define scope and conditions, and where the evaluation criteria are straightforward. The Solicited Proposals process will be pursued when the Authority needs to be specific and directive regarding scope and conditions, or where the evaluation criteria are more complex.

The following describes the procedures (A) for the Authority's review of Unsolicited Proposals and (B) for completing those Unsolicited Proposals which are favorably reviewed.

A. Step 1 – Review of Unsolicited Proposal

- A party (Original Proposer) submits an Unsolicited Proposal package, which includes a *Conceptual Proposal* and a *Detailed Proposal*, along with the Review Fee and Proposal Fee described in Section II above.
- The Authority acknowledges receipt of the proposal in writing.
- The Authority conducts a review of the *Conceptual Proposal* only and, based on this review, determines whether to accept the Proposal for further review or to reject it.
- If the Proposal is rejected based on the contents of the *Conceptual Proposal*, the *Detailed Proposal* will be returned to the Original Proposer unopened, along with the Proposal Fee contained therein.
- If the Authority decides to conduct a further review of the Unsolicited Proposal, it will notify the Original Proposer of the decision and will post a notice on its website www.mwaa.com under "Business Information; Opportunities; Land Development" which: (i) states it has received an Unsolicited Proposal; (ii) identifies the property addressed by the Unsolicited Proposal; and (iii) in the Authority's words, summarizes the nature of the Unsolicited Proposal. This posting is for public notice purposes only. (The Original Proposer's *Conceptual Proposal* will not be posted on the website at this time but may, based on decisions in Step 2, be posted at a later time.)
- The Authority then will review the *Detailed Proposal*, and decide whether to advance the Unsolicited Proposal to the next step or to reject it. If the Authority decides to reject the Unsolicited Proposal, it will return *Detailed Proposal* along with the Proposal Fee.

B. Step 2 – Competing the Unsolicited Proposal

- Based on its review of the *Conceptual Proposal* and *Detailed Proposal*, the Authority will decide whether to:
 - Invite Competing Unsolicited Proposals (Step 2a), or
 - Initiate a Solicited Proposals process (Step 2b).
- However, any Unsolicited Proposal that involves the sale of land to the Proposer will automatically move to the Step 2b Solicited Proposals process.

Step 2a – Invitation for Competing Unsolicited Proposals

- The Authority will notify the Original Proposer that the Authority is proceeding to open competition by providing an opportunity for interested parties to submit proposals which are competitive with the Original Proposer's Unsolicited Proposal. All competing proposal submissions must include the Review Fee (non-refundable) and Proposal Fee (refundable to those not selected).
- The Authority will modify existing notices relating to the Unsolicited Proposal on its website, will post an invitation for Competing Unsolicited Proposals with instructions and guidance for the competing submissions, and will post the Original Proposer's *Conceptual Proposal*.
- In response to this invitation, the Original Proposer may revise and resubmit its *Detailed Proposal* on the same schedule as advertised for Competing Unsolicited Proposals.
- At the Authority's option, the *Conceptual Proposals* of all submitted Competing Unsolicited Proposals will be posted on the Authority's website in the same location as the Original Proposer's *Conceptual Proposal*.
- The Authority will review the *Conceptual Proposals* and *Detailed Proposals* included in the submitted Competing Unsolicited Proposals, will evaluate them together with the Original Proposer's Unsolicited Proposal (including a revised *Detailed Proposal*, if submitted), and will select a proposer (Selected Proposer) for contract negotiations.
- The Authority reserves the right to request Best and Final Offers from those Proposers of Unsolicited Proposals that it judges to be in the competitive range.
- The Authority reserves the right to terminate the Step 2a process and return the *Detailed Proposals* and Proposal Fees at any time and without making a selection.

Step 2b – Solicited Proposals

- The Authority will notify the Original Proposer in writing that it is proceeding to open competition by initiating a Solicited Proposals process in which it will solicit proposals for the development and use of the Property, or parts thereof, in accordance with a set of requirements set out in a formal solicitation document. In this case, the Original Proposer's *Detailed Proposal* will be made obsolete by the solicitation, and will be returned to the Original Proposer along with the Proposal Fee.
- The Authority will post a notice on its website indicating that it will initiate a Solicited Proposals process and will note the approximate date when the solicitation will be posted.

- In presenting relevant background information and the requirements to be met by proposers responding to the solicitation, the Authority may use non-proprietary elements of the Original Proposer's *Conceptual* and *Detailed Proposals*, as it deems appropriate.
- In the solicitation document, the Authority also will establish the due date for the submission of proposals and the criteria by which submitted proposals will be evaluated.
- To continue to be considered, the Original Proposer must respond to this solicitation by submitting a proposal in accordance with its terms.
- The Authority will evaluate all submitted proposals on the basis of the evaluation criteria and will identify a Selected Proposer with whom to begin contract negotiations.
- The Authority reserves the right to request Best and Final Offers from the proposers it judges to be in the competitive range.
- The Authority reserves the right to cancel the Step 2b process at any time, returning any Proposal Fees required by the solicitation, and without making a selection.

C. Step 3 – Negotiations and Approvals

- The Authority and the Selected Proposer will enter into contract negotiations based on the terms and conditions of the Selected Proposer's proposal.
- If the parties fail to conclude negotiations, the Authority may elect to pursue negotiations with another proposer, which will become the new Selected Proposer.
- Upon the execution of an agreement or the termination of negotiations, the Proposal Fees of the non-selected proposers will be returned.

ATTACHMENT 1

Suggested Content of *Conceptual Proposal* Submissions

In an Unsolicited Proposal offer, the *Conceptual Proposal* is the first document opened by the Authority and is the only document the Authority will use in determining its willingness and interest in *accepting* an Unsolicited Proposal for further consideration. Following such acceptance, the *Conceptual Proposal* is the document that will be used by Authority technical staff in deciding whether to move the Unsolicited Proposal to the next stage of the process which involves competition. If the process proceeds to a call for Competing Unsolicited Proposals, the *Conceptual Proposal* will be publicly posted along with an invitation for competing proposals. Therefore, this *Conceptual Proposal* must give enough detail to establish the Unsolicited Proposal concept as viable, desirable and in the Authority's interests without divulging details that the Proposer submitting the Unsolicited Proposal does not wish to have made public, such as proprietary or sensitive information, or a unique competitive strategy.

The Authority takes no responsibility for any impacts caused a Proposer by its inclusion of proprietary or sensitive information in its *Conceptual Proposal*.

The list that follows includes information that might be submitted as part of a *Conceptual Proposal*; the list should not be regarded as describing, and is not intended to describe, required information. The *Conceptual Proposal* might contain the following:

1. Project Characteristics

- a. A description of the project, including its fundamental business concept and facility features, that outline the proposed project in a manner that ensures that its nature and purposes are clearly understood.
- b. The scale and types of revenue opportunities for both the Proposer and the Authority.
- c. A conceptual site plan showing the proposed site for the project and indicating the proposed location and configuration of the project on the site.
- d. The projected positive social, economic and environmental impacts of the project.
- e. Any anticipated adverse social, economic and environmental impacts of the project, and the strategies or actions to mitigate such impacts.

- f. The most significant assumptions or conditions that must come about in order for the project to be successful.
- g. Any contingency plans or actions that add resiliency to the project.

2. Proposal Team Structure, Qualifications and Experience

- a. The characteristics of the Proposer's team, including the organizational structure, and how each partner and major subcontractor in the structure relates to the overall team.
- b. The identities and experiences of the companies and key individuals of the Proposer's team, including experience with projects of comparable size and complexity.
- c. The level of commitment to use Authority certified Local Disadvantaged Business Enterprises.
- d. The names, addresses, and telephone numbers of persons who may be contacted for further information.

3. Project Financing

- a. A preliminary estimate of the cost of the design and construction of the project, by phase if applicable.
- b. A generic plan for the development, financing and operation of the project.
- c. A list and discussion of major financial and other assumptions underlying the financing element of the generic plan.
- d. A list of significant project risk factors and methods for dealing with these factors.
- e. Market analyses supporting revenue forecasts.

4. Schedule/Phasing

- a. A proposed schedule for the project, including the estimated time for completion.
- b. A list of federal, state, local and Authority permits and approvals required for the project, and their relation to the schedule.
- c. Information relative to the phased or partial openings of the project.

ATTACHMENT 2

Suggested Content of *Detailed Proposal* Submissions

In the Original Unsolicited Proposal offer, the *Detailed Proposal* is the document reviewed by the Authority to determine whether and in what manner the generic concept of the Unsolicited Proposal should proceed to competition, through either Competing Unsolicited Proposals or Solicited Proposals. The *Detailed Proposal* will only be reviewed if the Authority, based on the related *Conceptual Proposal*, accepts the Unsolicited Proposal for further processing.

If the process advances to an invitation for Competing Unsolicited Proposals, the *Conceptual Proposal* and the *Detailed Proposal* of each Proposer (Original and Competing) will be treated as companion documents and will be used in combination in the evaluation. *Detailed Proposals* will not be posted on the website. The Authority expects that sufficient detail will be contained in the combination of the *Conceptual* and *Detailed Proposals* so that: (1) the Proposal is a fully-formed offer on which the Proposer is willing to place a Proposal Fee, (2) the Authority can gain the confidence that the proposal is both attractive and viable, and (3) the information gives the Authority's evaluators the best information possible in distinguishing a Proposer from his competitors. The depth and breadth of materials in the *Detailed Proposal* is at the Proposer's discretion; however, the Authority has no obligation for ex post facto consideration of Proposal detail held by the Proposer and not communicated to the Authority if its Proposal is rejected or passed-over in favor of a competitor's proposal.

If the Authority elects to proceed using the Solicited Proposal process, the Original Proposer's *Detailed Proposal* will be made obsolete by the solicitation. To continue to be considered, the Original Proposer must respond to this solicitation by submitting a proposal in accordance with its terms. The contents of the original Detailed Proposal will not be used to advantage or disadvantage the Original Proposer.

The Authority requires that *Detailed Proposal* (printed and electronic) copies be separately packaged and sealed (tamper-proof envelope, bag or box) by the Proposer so that, in the event that a *Conceptual Proposal* is not accepted or does not survive initial evaluations, the Authority has not been exposed to or reviewed any sensitive or proprietary information of the Proposer.

The list that follows includes information that might be submitted as part of a *Detailed Proposal*; the list should not be regarded as describing, and is not intended to describe, required information. The *Detailed Proposal* might contain the following:

1. Project Characteristics

- a. A detailed description of the project, including the business plan elements, supporting market research, and sublease commitments.
- b. A detailed discussion of assumptions regarding revenues.
- c. Assumptions related to ownership, legal liability, law enforcement, infrastructure construction and maintenance, and operation of the project, and the existence of any restrictions on the operation or use of the project.
- d. A detailed site plan indicating proposed location and configuration of the project on the proposed site, access/egress, and utility connections.
- e. Characteristics of the proposed project in terms of size, density, traffic impacts, utility service requirements, and any unique operational features or special events.
- f. Conceptual (single line) plans and elevations depicting the general scope, appearance and configuration of the proposed project.
- g. A list of public utility facilities, if any, which will be accessed or crossed by the proposed project and a statement of the plans of the Proposer to gain approvals for such connections or crossings.
- h. A description of any work proposed to be performed by the Authority or any other public sector entity that is not a member of the Proposer's team.
- i. A listing of firms that will provide specific design, construction and completion guarantees and warranties, and a brief description of such guarantees and warranties.
- j. A discussion of the project's compatibility or lack thereof with neighboring Authority and non-Authority land uses (actual, planned and proposed) and, where applicable, a summary of the steps required for reconciliation.
- k. The proposed approach to assessing environmental impacts, describing both what is known and what data must be collected and accessed.

2. Proposal Team Structure, Qualifications and Experience

- a. The legal structure and organizational structure of the Proposer's team, the management approach the team would bring to the project, and how each team member and major subcontractor fits into the overall approach.
- b. The identities and experience of the companies and key individuals of the Proposer's team, including experience with projects of comparable size and complexity, length of time in business, and other current engagements
- c. The names, addresses, and telephone numbers of persons on the Proposer's team who may be contacted for further information
- d. For each member of the Proposer's team and each major subcontractor, a summary of the work

performed by the member or subcontractor firm during the past five (5) years for up to five (5) clients on comparable projects, including contact information for such clients (the Authority prefers reference projects similar in scope and size to the proposed project).

- e. The past technical performance history on recent projects of comparable size and complexity, including disclosure of any legal claims for or against the relevant team member on those referenced projects.
- f. The identity of any firms that will provide design, construction and completion guarantees and warranties and a description of such guarantees and warranties.
- g. The past safety performance record and current safety capabilities of the Proposer's team.
- h. Worker safety training programs, job-site safety programs, accident prevention programs, written safety and health plans, including incident investigation and reporting procedures.
- i. Any Authority offices or employees, or persons or firms under contract with the Authority, known to the Proposer, who would be obligated to disqualify themselves from participation in any transaction arising from or in connection to the project.
- j. The level of commitment to use Authority certified Local Disadvantaged Business Enterprises including the names, roles, certification numbers or documents of certifications if already obtained, and percentage commitments of individual team members as known.
- k. Current or most recently audited financial statements of members of the Proposer's team having an equity interest of twenty percent (20%) or greater.
- l. Identification of the executive management, officers and directors of the members of the Proposer's team, along with the identification of any known conflicts of interest or other disabilities that may impact the Authority's consideration of the proposal.

3. Project Financing

- a. A detailed description of the proposed participation and financial involvement of each of the Proposer's team members.
- b. A preliminary estimate and estimating methodology of the cost of the work by phase.
- c. An operational plan including appropriate staffing levels and associated costs, and any supporting due diligence studies, analyses or reports
- d. A financial pro forma from the Proposer's perspective specifying proposed project start date; the anticipated commitment of parties (equity, debt, and other financing mechanisms); a schedule of projected project revenues and project costs; the expected useful life of the project elements; an estimate of annual operating expenses; and an analysis of the projected return or rate of return, or both.
- e. A financial pro forma from the Authority's perspective indicating what the Authority can expect to receive from the project and the value of any improvements or investments that will enhance or expedite the development of the remainder of the Property or of Dulles International.

4. Scheduling/Phasing

- a. The proposed schedule for the work on the project, including the estimated time for completion.
- b. A list of federal, state, local and Authority permits and approvals required for the project, and their relation to the schedule.
- c. Information relative to phased or partial openings of the proposed project.

5. Project Benefit and Compatibility

- a. A description of the compatibility of the project with Authority, other local, regional, and state economic development efforts.
- b. A recommended strategy and plan to be coordinated with the Authority that will involve and inform the general public, business community, local governments, and governmental agencies in areas affected by the project.

6. Forms and Certifications

A Proposer submitting an Unsolicited Proposal understands that the representations, information and data supplied in support of, or in connection with, the Proposal plays a critical role in the Authority's evaluation process and in the ultimate selection of a proposal by the Authority. Accordingly, as part of the *Detailed Proposal*, the Proposer and its team members should certify that all material representations, information and data provided in support of, or in connection with, the Proposal is, to the best of their knowledge, true and correct. Such certifications should be made by authorized individuals who have knowledge of the information provided in the proposal. In the event that material changes occur with respect to any representations, information or data provided for the proposal, the Proposer should notify the Authority of the same. Any deficiencies regarding certifications in the *Detailed Proposal* may cause the Authority to exercise its reserved right to reject the Unsolicited Proposal.

Metropolitan Washington Airports Authority

Real Estate Development Policies

Policies and Procedures

Regarding

Unsolicited Proposals

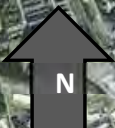
for

Western Lands

at

Washington Dulles International Airport

March 3, 2015



Route 606

Route 50

Route 28



Western Lands -- "The Property" --
within Dulles International



Washington Dulles
International Airport A-151



METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

WESTERN LAND AREA at WASHINGTON DULLES INTERNATIONAL AIRPORT



Illustrative Subdivision Plan

AIRPORTS AUTHORITY DEPARTMENT OF REAL ESTATE

CONTACT INFORMATION:

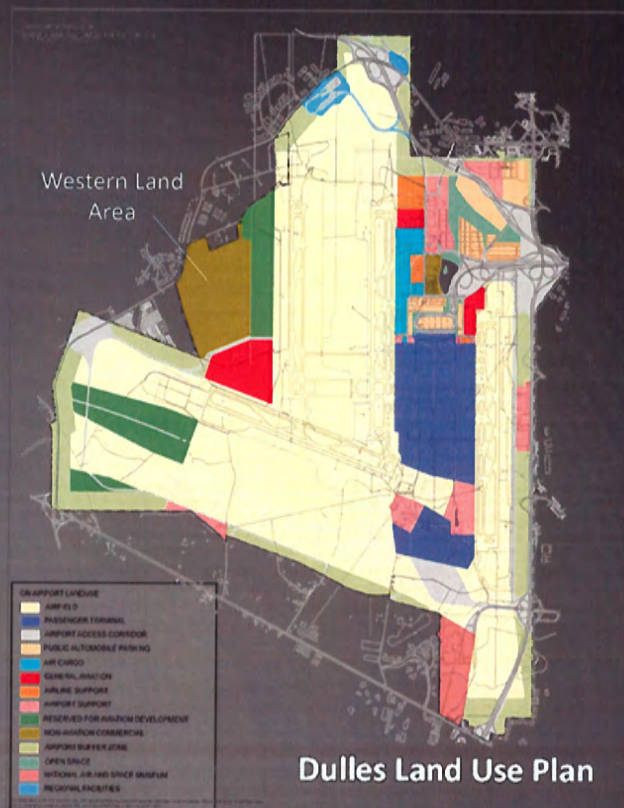
Jim Poff	703-572-1592	james.poff@mwaa.com
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METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

WESTERN LAND AREA at WASHINGTON DULLES INTERNATIONAL AIRPORT

- Approximately 430 acres for commercial development on airport property
 - Will sub-divide
 - Non-aviation uses are welcomed
 - Secure sites and data center sites easily developed
 - Unsolicited proposals invited
- <http://www.metwashairports.com/384.htm>



View to the west overlooking IAD's Western Land Area and Route 606



AIRPORTS AUTHORITY DEPARTMENT OF REAL ESTATE

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