MEMORANDUM

To: Ed Gorski, Piedmont Environmental Council
From: Lucinda E. Gibson, P.E., Vice President
Date: 30 September 2005
Re: Local and Regional Traffic Impacts from the Proposed Greenvest Comprehensive Plan Amendment

The Greenvest Proposed Comprehensive Plan Amendment will dramatically alter the development and transportation environment in the South Dulles area of Loudoun County. We have assessed these impacts through use of the MWCOG-TPB Travel Demand Model (Metropolitan Washington Council of Governments Transportation Policy Board). This model provides a long range, comprehensive analysis of the regions highway and transit systems, and is a useful tool for evaluation regionally significant development proposals such as Greenvest.

The model essentially works by taking employment and residential land uses by transportation analysis zone, or TAZ, throughout the region, and determining how much traffic would be generated. Vehicle Trips from each TAZ are assigned to the road network to connect from their starting TAZ to their destination based in the shortest travel time. As traffic is loaded onto the road network, some roads will have so much traffic that they become congested, and travel times are reduced, possibly changing what route the shortest path would be. Several iterations of assignment and trip re-routing are conducted in the model until stability or equilibrium is reached. The MWCOG-TPB model currently has the year 2020 land use forecasts and planned transportation improvements, so that is the horizon year for purposes of this review.

An article describing the regional model, published in MWCOG-TPB *Region* periodical, is attached to this memorandum. More information about the MWCOG-TPB model can be found on the internet at:

http://www.mwcog.org/transportation/activities/models/

Traffic Impact Review Process

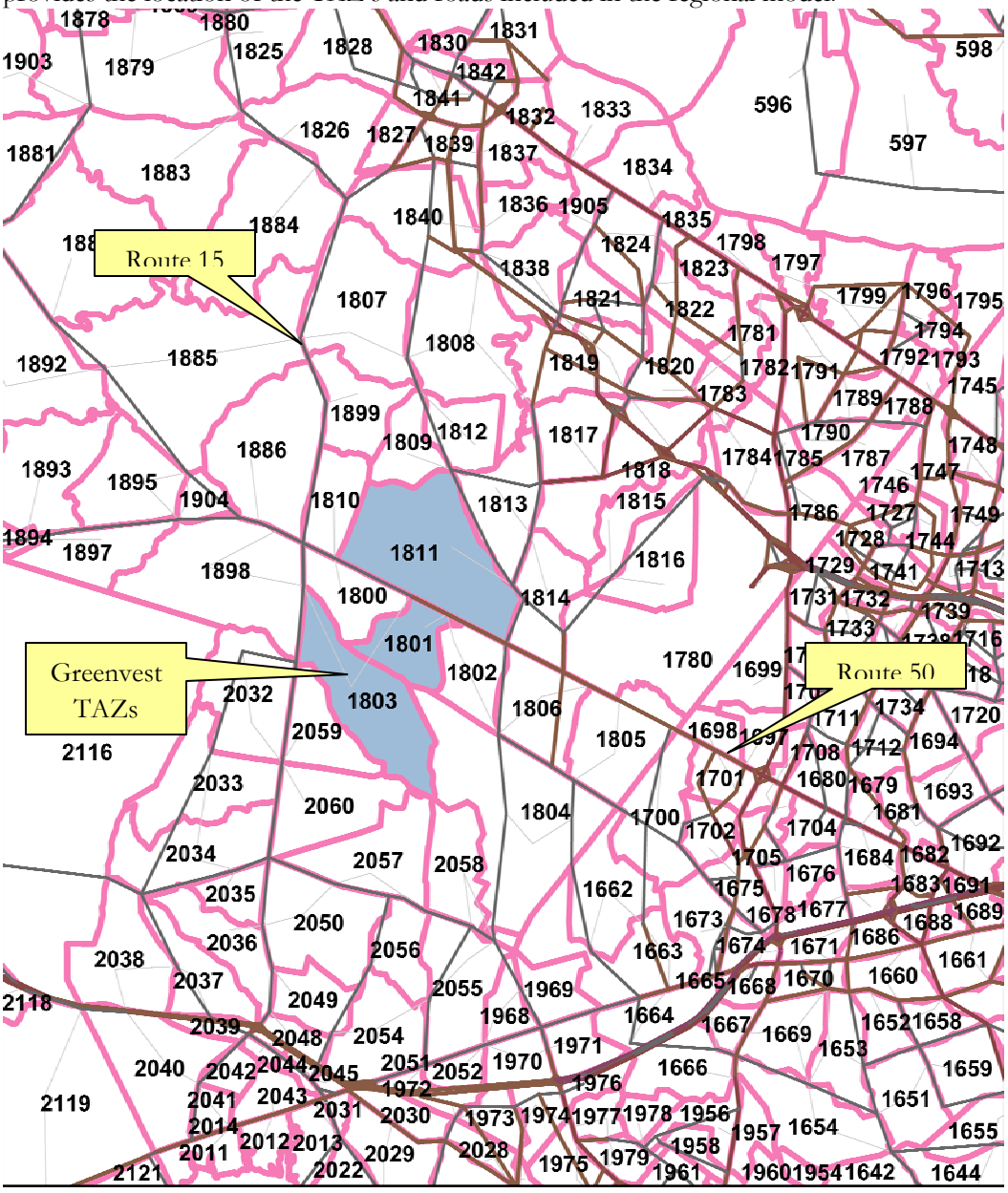
The proposed Greenvest Amendment was characterized in terms of the amount of households and employment it would generate beyond that planned for the area.

The land inputs required for the travel demand model include the following:

- Households
- Population
- Industrial Employment
- Retail Employment
- Office Employment
- Other Employment

While the current forecasted land uses for the year 2020 account for some growth in the area of the Greenvest proposal, significant additional residential and employment growth must be assumed to forecast likely future traffic from this large development.

The Greenvest lands proposed for development lie within the TAZs 1801, 1803, and 1811. The map below provides the location of the TAZ's and roads included in the regional model.



The following table shows the base year, 2020 Metropolitan Plan forecast, and 2020 with Greenvest for each affected TAZ.

Table 1: TAZ Data for Greenvest Area

2005 Base

TAZ	HH	HHPOP	TOTALPOP	TOTALEMP	INDULEMP	RETAIEMP	OFFICEMP	OTHEREMP
1801	142	382	382	203	53	51	48	51
1803	163	451	451	-	-	-	-	-
1811	170	454	454	487	127	122	116	122
Total TAZ	475	1,287	1,287	690	180	173	164	173

Projected Growth 2005 through 2020

TAZ	HH	HHPOP	TOTALPOP	TOTALEMP	INDULEMP	RETAIEMP	OFFICEMP	OTHEREMP
1801	329	858	858	547	142	137	131	137
1803	492	1,345	1,345	343	89	86	82	86
1811	131	343	343	453	117	113	110	113
Total TAZ	952	2,546	2,546	1,343	348	336	323	336

2020 Metropolitan Plan Official Forecast

TAZ	HH	HHPOP	TOTALPOP	TOTALEMP	INDULEMP	RETAIEMP	OFFICEMP	OTHEREMP
1801	471	1,240	1,240	750	195	188	179	188
1803	655	1,796	1,796	343	89	86	82	86
1811	301	797	797	940	244	235	226	235
Total TAZ	1,427	3,833	3,833	2,033	528	509	487	509

Proposed Development for Greenvest 2005-2020

TAZ	HH	HHPOP	TOTALPOP	TOTALEMP	INDULEMP	RETAIEMP	OFFICEMP	OTHEREMP
1801	5,000	13,316	13,316	300		45	255	-
1803	5,000	13,316	13,316	985		148	837	-
1811	5,000	13,316	13,316	460		69	184	207
Total TAZ	15,000	39,948	39,948	1,745	-	262	1,276	207

2020 Revised Land Use Forecasts with Greenvest

TAZ	HH	HHPOP	TOTALPOP	TOTALEMP	INDULEMP	RETAIEMP	OFFICEMP	OTHEREMP
1801	5,142	13,698	13,698	874	195	188	303	188
1803	5,163	13,767	13,767	1,160	89	148	837	86
1811	5,170	13,770	13,770	1,108	244	235	300	329
Total TAZ	15,475	41,235	41,235	3,142	528	571	1,440	603

The Greenvest proposal would result in a 15 fold increase in residential growth in these TAZ's. The following graph compares the amount of growth projected in the Metropolitan Plan and MWCOG TPB Model with that resulting from the Greenvest proposal. This is also illustrated on the following chart, which shows the projected growth in housing, population, and employment for the three zones combined (1801, 1803, and 1811) of the metropolitan plan versus with the Greenvest CMPA.

Figure 1: Growth in Households, Population and Employment in Greenvest TAZs in the Metropolitan Plan versus the Greenvest CMAP

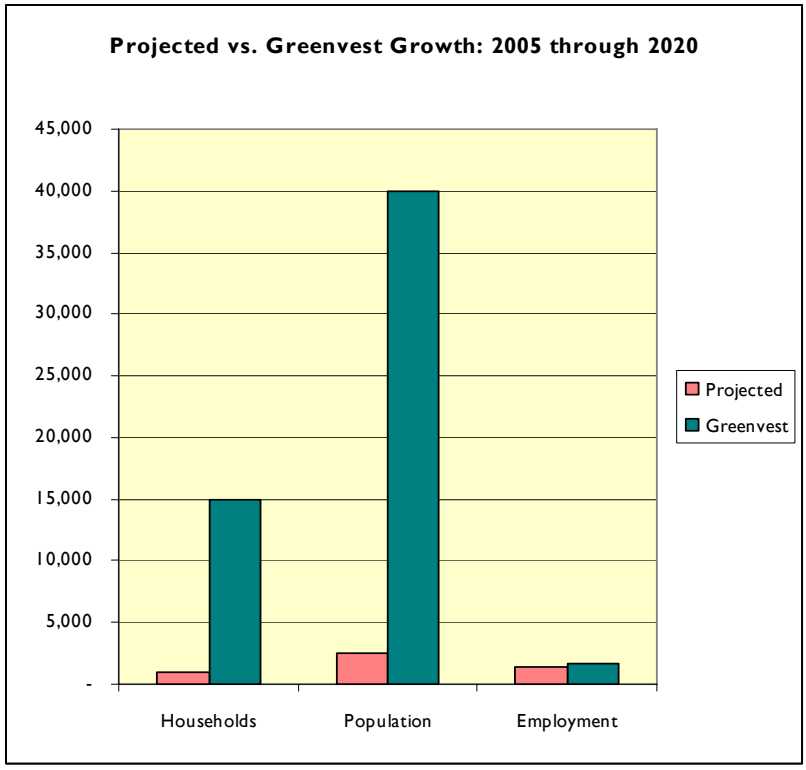
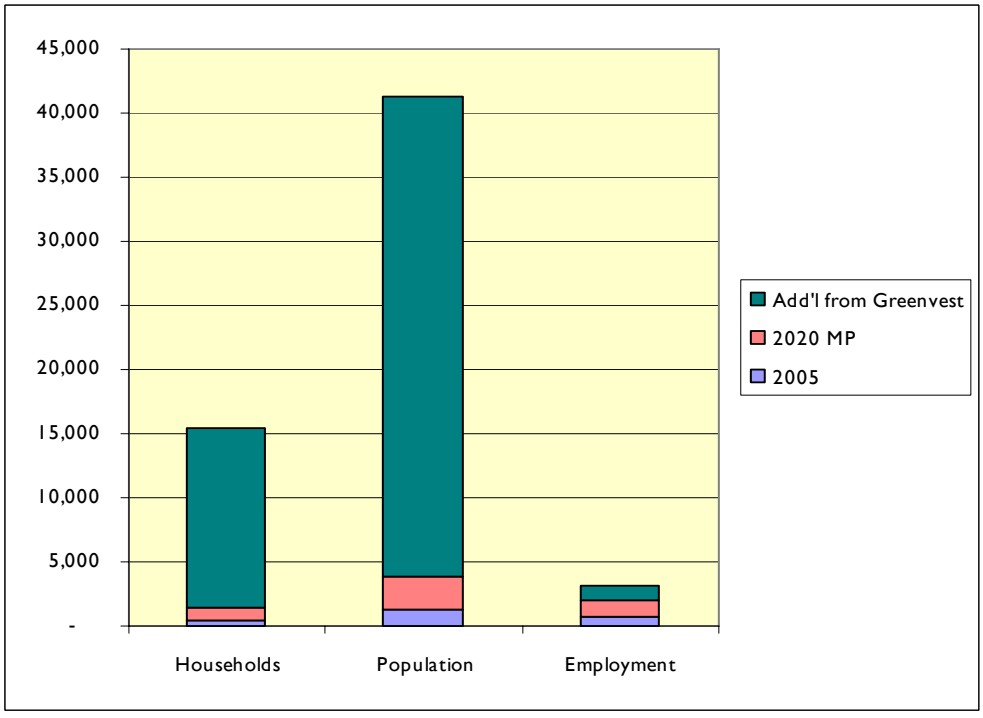


Figure 2:Total Land Use in Three Greenvest TAZs



Traffic Impacts from Greenvest CMAP

Traffic improvements that are proposed as part of the Greenvest CMAP were included in the travel demand modeling impact assessment. These include the following improvements, beyond what has already been planned for the area in the Metropolitan Plan.

UPPER BROAD RUN-CDA NO. 1

- Route 50-Phase I: 1 lane on north side of west bound lanes from existing Route 659 to Route 659 relocated (5,500 ft)
- Rt. 50/659 Interchange-Full Urban Diamond
- Rt. 659 North-Phase I- 2 lanes from Route 50 to relocated Rt. 621 (9,000 ft)
- Rt. 659 North-Phase II- 2nd 2 lanes from Route 50 to relocated Rt. 621 (9,000 ft)
- Rt. 621-Phase I-4 lanes from Rt. 659 to Arcola entrance (3,000 ft)
- Arcola Spine Road-4 lanes divided (10,000 ft)

UPPER BROAD RUN-CDA NO. 2

- Route 50-Phase II-4 laning from end of current 4 lanes to Lenah connector (4,000 ft)
- Route 50-Phase III-4 laning from Lenah connector to western edge of Broad Run Village (6,700 ft)
- Route 50-Phase IV-3rd west bound lane from Lenah Connector to western edge of Broad Run Village (6,700 ft)
- Route 50-Phase V-3rd east bound lane from Lenah Connector to western end of Broad Run Village (6,700 ft)
- Route 621-Phase II-add 2 lanes from Arcola entrance to end of Broad Run Village (5,600 ft)
- Broad Run Spine Road-4 lanes divided (16,500 ft)

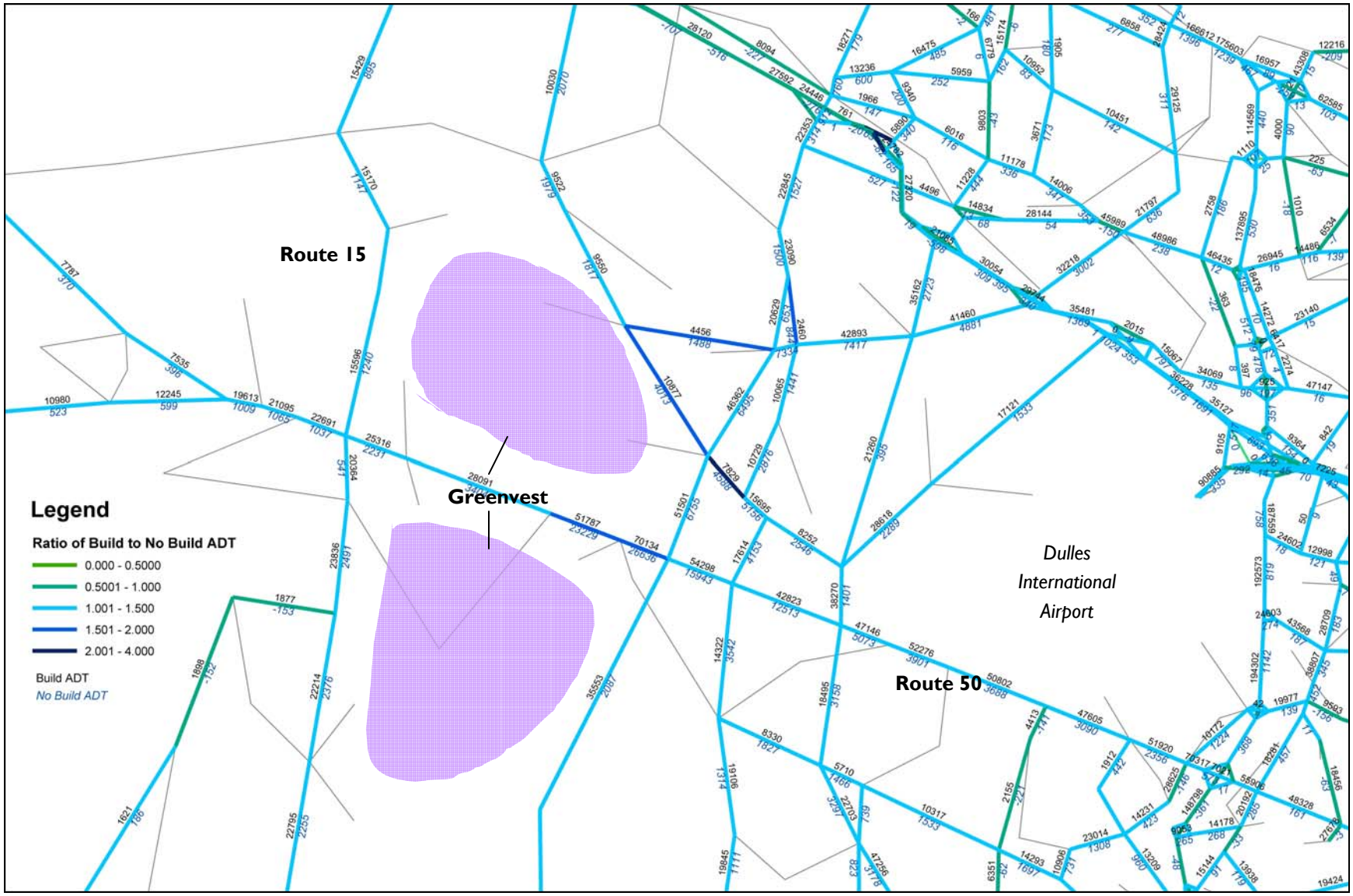
UPPER FOLEY CDA

- Rt. 659 South-Phase I- 2 of 4 lanes from Rt. 50 to Braddock Road (9,000 ft.)
- Route 659-Phase II-2 of 4 lanes from Braddock to northern Greenfields entrance (4,800 ft)
- Rt. 659 South-Phase III- 2nd 2 of 4 lanes from Rt. 50 to Braddock Road (9,000 ft)
- Route 659-Phase IV-2 of 4 lanes from Braddock to northern Greenfields entrance (4,800 ft)
- Route 659-Phase V-2 of 4 lanes from Greenfields entrance to southern property line (7,200 ft)
- Braddock Road-Phase I-2 of 4 lanes from Rt. 659 to Lenah entrance (4,000 ft)
- Braddock Road-Phase II-2 lanes from Lenah entrance to Gulick Property (6,200 ft)
- Braddock Road-Phase III-2nd 2 of 4 lanes from Route 659 to Lenah entrance (4,000 ft)
- Lenah Connector South-4 lanes from Tall Cedars to Route 50 (2,300 ft)
- Greenfields/Lenah Spine Road-4 lanes divided (30,000 ft)

Some of these roads are not included in the MWCOG model. All improvements that are on roads included in the model were entered into the Greenvest Proposal scenario.

The results of the MWCOG model are presented on the following graphics. Below shows the model link results for the area immediately around the Greenvest proposal. The link ADT volumes are shown, and links with the darkest blue color are those with the greatest growth in traffic from the proposal.

Figure 3: ADT for Build Scenario and Change in ADT



These show significant growth in ADT in the Greenvest area. Many of the intersections and links exceed capacity. The following graphics compare the volume/capacity ratios of these links for the 2020 Metropolitan Plan scenario with the Greenvest Proposal, including the proposed road improvements.

Figure 4 on the following page shows the effects of the Greenvest traffic and improvements in terms of roadway links that are in overcapacity conditions with the Greenvest traffic but not in the comprehensive plan (bright red), and roadway links that are already overcapacity but which the Greenvest proposal will exacerbate (purple). This indicates a need to look more comprehensively at the road network, development patterns, and alternative development and growth patterns that would lessen these severe impacts.

Figure 5, on the following page, shows the resulting Volume to Capacity ratios for the year 2020 with the Greenvest traffic and road improvements. The dashed lines represent the varying conditions for each direction of the roadway.

Conclusions

The Greenvest proposal will bring development to an area far in excess of what has been planned and forecast through the MWCOG travel demand model. While road improvements are also proposed, they are vastly insufficient to address the impacts. In fact, the regional plan, without the Greenvest amendments, already shows growth in excess of road capacity for many roadways. It would be prudent to consider this in light of any proposals that would even worsen these over capacity, congested conditions in the future.

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Figure 4: Greenvest Impact to V/C Ratios on Area's Road Network

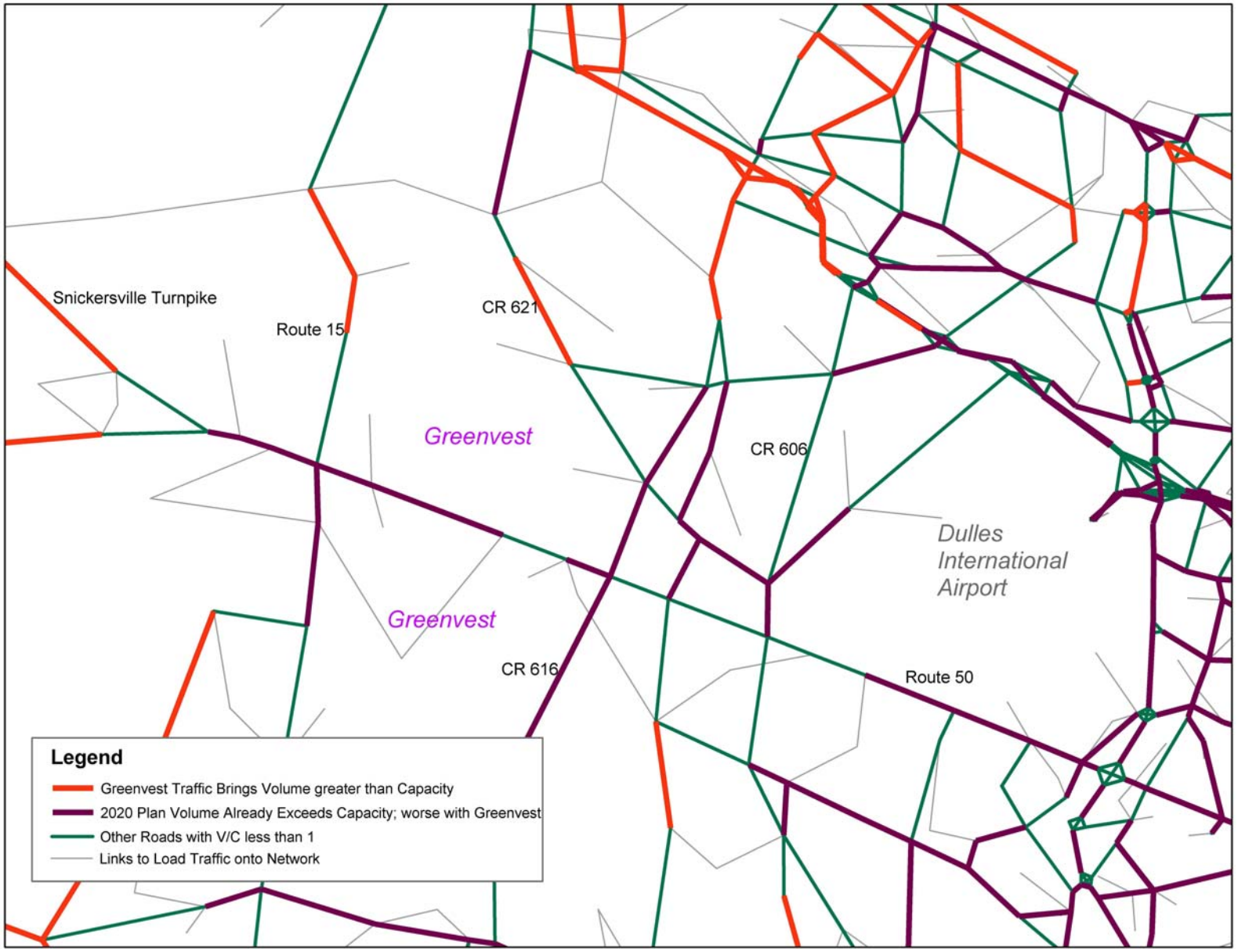

Figure 5: 2020 V/C Ratios with Traffic and Improvements of Proposed Greenvest Amendment