Northern Virginia Transportation Commission

NVTC

Mode Share Comparisons for Northern Virginia's Major Transportation Corridors

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Sharmila Samarasinghe
Tamara Ashby

AWARD WINNER NVTC APTA 1996

4350 N. Fairfax Drive • Suite 720 • Arlington, VA 22203
703-524-3322 • Fax: 703-524-1756 • TDD: 800-828-1120 • VA Relay Service • E-mail: nvtc@nvtdc.org

Introduction

The importance of establishing a choice of transportation modes for the efficient and effective movement of persons and goods throughout Northern Virginia remains a paramount priority to all public agencies and private groups in the arena of transportation in Northern Virginia. Historically, achieving this goal through an informed mix of public transit facilities and additional highway capacity is the method that has shown the most favorable results.

This report consolidates mode share information for Northern Virginia's major transportation corridors in which transportation mode choices are available as a result of previous investments. The motivation to analyze mode share information, by specific corridor, is to gain a better understanding of transit and ridesharing performance in those specific markets.

The National Capital Region Transportation Planning Board of the Metropolitan Washington Council of Governments conducts several data collection exercises. The Beltway Cordon counts and the Metro Core Cordon counts are two such monitoring projects. The Virginia Department of Transportation (VDOT) commissions traffic counts as part of its preliminary engineering process for various highway improvements. The information presented in the following pages is from the most recent of these regional travel-monitoring efforts.

The Metro Core Cordon counts are performed in Washington D.C. and parts of Arlington County, along a line that includes Pentagon City, Pentagon, Crystal City, and Rosslyn. Counting stations are strategically located on radial routes that cross the cordon line. Counts are taken of all traffic crossing this line, into the metro core.

The inner loop of the Capital Beltway defines the boundary for the Capital Beltway Cordon Counts. Traffic counts are taken immediately inside this boundary. The counting stations are located on major radial highways that cross or connect to the inner loop of the Capital Beltway.

In both counts, vehicles and passengers that cross the cordon line are recorded. Traffic is counted once at each site for the inbound (5:00-10:00 AM) as well as for the outbound directions (3:00 – 8:00 PM). Traffic counts are conducted on single days at each site. Care is taken to collect data on typical days. Data collection is performed on Tuesdays, Wednesdays, and Thursdays. If any of these days occur prior to or after a holiday, data collection is postponed to a day that would provide a more reasonable representation of true traffic conditions. When using the data and observations drawn from these travel-monitoring efforts, it should be recognized that travel characteristics vary from day to day so these counts offer only a snapshot estimate of regular traffic conditions.

To offer an inclusive description of the travel patterns within the Metro Core and across the Capital Beltway, the traffic counts are supplemented with transit information from WMATA as well as local transit providers.

For the Metro Core Cordon Count all Metrobus, Metrorail, Virginia Railway Express, and other transit services crossing the cordon line are counted. Metrorail passenger volumes are assigned to the traffic counting station closest to the location that the rail line crosses. Commuter bus data are obtained by telephone interviews with bus company operators. They are asked to describe routes, schedules, and average ridership by trip. From this data commuter bus ridership crossing the cordon lines are assigned by station and time period. VRE provides data, by time period, of passengers traveling to and from Union Station, in Washington, DC. Assignment of VRE passenger volumes is on a similar basis as Metrorail passenger volumes. This same approach was applied to the Beltway Cordon Counts to report transit data.

In preparing the HOV Facilities Performance Report, ridership data are obtained from bus and rail service providers in each corridor. On the I-95/I395 corridor transit data are provided by WMATA, Fairfax County, city of Alexandria, VRE, PRTC and by private coach companies. On I-66 WMATA, Fairfax County, PRTC, Loudoun County, and private coach operators provide corridor transit data. Bus ridership is obtained from services operating on HOV facilities. Rail ridership was collected from rail lines parallel to the study facilities, at locations similar to the counting stations. Care has been taken to avoid 'double counting' errors.

This report is organized by major corridor, with a table in each section summarizing the available data. A list of mode share resources and the type of data they contain is included in **Appendix A**.

Mode Share Comparisons

The data for the Northern Virginia counting stations contained in the 1998 Beltway Cordon Count Report and the 1996 Metro Core Cordon Count Report were used to compile the following tables together with several special studies. All represent the most recent studies of their type available. They reflect conditions at different sets of geographic locations and are not intended in this report to provide trend information.

1998 Beltway Cordon Count

According to the *1998 Beltway Cordon Count*, 14 percent of the commuting population in Northern Virginia use transit to cross the Beltway. High Occupancy Vehicles with two passengers (HOV-2) capture 16 percent, and 12 percent of all vehicles crossing the beltway are comprised of High Occupancy Vehicles with three or more passengers (HOV-3) and vanpools.

The mode share percentages for Northern Virginia contained in the *1998 Beltway Cordon Count* follow the regional (entire metropolitan area of Washington DC, suburban Maryland and Northern Virginia) mode share percentages, closely.

Table 1

	Northern Virginia Mode Share[1]		Regional Mode Share	
	6:30-9:30AM Inbound Traffic			
	1998 Beltway Cordon Count	% Total	1998 Beltway Cordon Count	% Total
Transit Bus	3,185	1.5%	9,384	1.8%
Commuter Bus	1,499	0.8%	3,454	0.7%
Commuter Rail	3,709	1.7%	10,474	2.0%
Metro rail	20,916	10%	39,598	7.7%
Total Transit	**29,309**	**14%**	**62,910**	**12.3%**
SOV	120,555	58%	321,341	62.5%
HOV 2	32,642	15.7%	86,630	16.8%
HOV 3+	20,427	9.8%	34,434	6.7%
Vanpools[1]	4,416	2.1%	8,808	1.7%
Total Vehicle	**178,040**	**86%**	**451,213**	**87.7%**
Total Passengers	**207,349**		**514,123**	

[1] In calculating the Northern Virginia mode share, all counting stations that are found within sectors 7,8,9,10 were combined.

[2] Vanpools are vans with 8 or more passengers. For both cordon counts a factor of 12 persons was used to calculate Vanpool passengers. Vans with less than 8 occupants were counted as automobile occupancy

/996 Metro Core Cordon Counts

The *1996 Core Cordon Count* shows that 37 percent of passengers, in the Washington region, crossing the core cordon are transit users, while 16 percent use HOV-2, and 9.5 percent use HOV-3 and vanpools.

In comparison, 29 percent of commuters in Northern Virginia use transit to cross the metro core into parts of Arlington County and the District of Columbia. This is almost ten percent less than the regional mode share for transit.

Table 2

Northern Virginia Mode Share			Regional Mode Share	
6:30-9:30AM Inbound Traffic				
	1996 Core Cordon Count	% of Total	1996 Core Cordon Count	% of Total
Transit Bus	11,123	5.9%	35,962	7.8%
Commuter Bus	7,908	4.1%	9,402	2.0%
Commuter Rail	3,142	1.6%	10,272	2.2%
Metro rail	33,353	17.6%	118,961	25.4%
Total Transit	**55,526**	**29.2%**	**174,597**	**37.4%**
SOV	78,895	41.5%	173,144	37.1%
HOV 2	28,206	14.8%	74,668	16%
HOV 3+	22,487	12%	36,465	7.8%
Vanpools	4,692	2.5%	8,231	1.7%
Total Vehicle	**134,280**	**70.8%**	**292,506**	**62.6%**
Total Passengers	**189,806**		**467,105**	

I-395/I-95 Corridor

The HOV facility on the I-95/I395 corridor is a barrier separated and reversible highway, extending from Dumfries Road to the Potomac River. Several dedicated HOV on-ramps provide exclusive access to HOV lanes from Park-and-Ride facilities in Prince William County. The one-mile extension of this corridor north of the Pentagon does not currently have HOV restrictions. VRE, Metrobus, Metrorail Blue line, DASH, Fairfax County Connector, Omni Ride, and private coach companies operate public and private mass transit along this corridor.

Table 3a

I-95/I-395 Mode Share		
6:30-9:30AM Inbound Traffic		
	1998 Beltway Cordon Count	**% of Total**
Transit Bus	282[1]	0.7%
Commuter Bus	1,259	2.9%
Commuter Rail	3,709[2]	8.7%
Metro rail	3,791[3]	9%
Total Transit	**9,041**	**21%**
SOV	15,244	36%
HOV 2	4,644	11%
HOV 3+	11,918	28.2%
Vanpools	1,356	3.2%
Total Vehicle	**33,162**	**79%**
Total Passengers	**42,203**	

1 Shirley Hwy. all lanes combined
2 Backlick Rd. and Van Dorn Street Counting station
3 Van Dorn Street Metro Station

Table 3b

I-95/I-395 Mode Share 6:30-9:30AM Inbound Traffic		
	1996 Core Cordon Count	**% of Total**
Transit Bus	7,577	9.9%
Commuter Bus	6,052	7.9%
Commuter Rail	3,142[1]	4.1%
Metro rail	10,693[2]	13.9%
Total Transit	**27,464**	**36%**
SOV	23,574	30.8%
HOV 2	6,264	8.1%
HOV 3+	16,573	21.6%
Vanpools	2,544	3.3%
Total Vehicle	**48,955**	**64%**
Total Passengers	**76,419**	

[1] Crystal City Commuter Rail Station
[2] Numbers for Blue and Yellow Line

I-66 Corridor

Four reports, the *1998 Beltway Cordon Count*, the *1996 Core Cordon Count*, the *1998 HOV Report* and the *1997 VDOT I-66 HOV Report*, give mode share data for the I-66 corridor.

On the I-66 corridor, 'other buses' are defined as all buses that are not transit buses. This includes school buses, charter buses, prison buses, Greyhound buses, PRTC buses, and Loudoun County buses. As there are 'in service' buses as well as 'out of service' buses that cross the I-66 corridor, occupancy of these vehicles is assigned based on those buses that are 'in service'.

Table 4a

Mode Share on I-66		
6:30-9:30AM Inbound Traffic		
	1998 Beltway Cordon Count	% of Total
Transit Bus[1]	201	0.9%
Other Bus	92	0.4%
Metro rail	12,393	54.7%
Total Transit	**12,686**	**56.2%**
SOV	1,544	6.8%
HOV 2	6,170	27.3%
HOV 3+	1,791	7.9%
Vanpools	396	1.7%
Total Vehicle	**9,901**	**43.8%**
Total Passengers	**22,587**	

[1] Transit Bus passengers at the Arlington Blvd, Leesburg Pike, Lee Highway and I-66 between Leesburg Pike and I-495 stations were combined.

Table 4b

Mode Share on I-66		
6:30-9:30AM Inbound Traffic		
	1996 Core Cordon Count	% of Total
Transit bus	80	0.2%
Commuter Bus	1,856	4.7%
Metro rail	22,660[1]	57.7%
Total Transit	**24,596**	**62.8%**
SOV	3,688	9.4%
HOV 2	7,310	18.6%
HOV 3+	2,839	7.2%
Vanpools	804	2.0%
Total Vehicle	**14,641**	**37.2%**
Total Passengers	**39,237**	

The section between the Capital Beltway (I-495) and Rosslyn is restricted to HOV-2+ use only during the peak commute period in the peak direction.

Table 4c

Mode Share on I-66		
6:30-9:30AM Inbound Traffic		
	1997 I-66 HOV-2 Report	% of Total
Bus[2]	612	2.3%
Metro rail	15,597	59%
Total Transit	**16,209**	**61.3%**
SOV	1,604	6%
HOV 2	6,636	25%
HOV 3+	1,480	5.6%
Vanpools	528	2.1%
Total Vehicle	**10,248**	**38.7%**
Total Passengers	**26,457**	

[1] Ridership at the Courthouse Station on the Orange Line
[2] Classification used by 1997 I-66 HOV-2 Report

VA-267 (Dulles Toll Road) Corridor

The HOV lanes on the Dulles Toll Road were operational starting in December 1998. Data for the Beltway Cordon Count Report were collected in Spring, 1998. The *1998 Beltway Cordon Count* shows the transit mode share for VA-267 to be similar to Northern Virginia's mode distribution as well as to the region's transit mode share of 14 percent.

Table 5a

Mode Share on VA 267		
6:30-9:30AM Inbound Traffic		
	1998 Beltway Cordon Count	**% of Total**
Bus	1,254	12.7%
Commuter Bus	148	1.5%
Total Transit	**1,402**	**14.2%**
SOV	5,640	56.6%
HOV 2	1,828	18.3%
HOV 3+	724	7.3%
Vanpools	360	3.6%
Total Vehicle	**8,552**	**85.8%**
Total Passengers	**9,954**	

The *1998 HOV Report* assigns eight percent of the total trips on VA-267 to transit. SOV is the mode of choice for 67 percent of the commuters, which is about the same percentage as the Washington region, but higher in comparison to Northern Virginia. Data was collected in Fall, 1998 for the 1998 HOV Report, also before the HOV lanes were opened.

Table 5b

Mode Share on VA 267		
6:30-9:30AM Inbound Traffic		
	1998 HOV[1] Report	**% of Total**
Transit Bus	1,387	6.8%
Commuter Bus	259	1.2 %
Total Transit	**1,646**	**8%**
SOV	13,951	67.9%
HOV 2	3,716	18%
HOV 3+	1,020	4.9%
Vanpools	216	1.0%
Total Vehicle	**18,903**	**92%**
Total Passengers	**20,549**	

[1] VA 267 Facility Totals

US 1 Corridor

Table 6a

Mode Share on US 1		
6:30-9:30AM Inbound Traffic		
	1998 Beltway Cordon Count	% of Total
Transit Bus	250	1.6%
Commuter Bus	0	0.0%
Commuter Rail[1]	0	0.0%
Metro rail[2]	4,732	30.5%
Total Transit	**4,982**	**32.2%**
SOV	7,120	46%
HOV 2	2,592	16.7%
HOV 3+	746	4.8%
Vanpools	60	0.3%
Total Vehicle	**10,518**	**67.8%**
Total Passengers	**15,500**	

[1] Commuter Rail was not counted on this corridor as it was counted for in the I-95/I-395 corridor table on Page 6
[2] Eisenhower Station and Huntington Station

Table 6b

Mode Share on US 1		
6:30-9:30AM Inbound Traffic		
	1996 Core Cordon Count	**% of Total**
Transit Bus	333	1.3%
Commuter Bus	0	0.0%
Commuter Rail[1]	0	0.0%
Metro rail[2]	0	0.0%
Total Transit	**333**	**1.3%**
SOV	6,452	60%
HOV 2	2,780	26.7%
HOV 3+	726	7%
Vanpools	516	5%
Total Vehicle	**10,474**	**98.7%**
Total Passengers	**10,807**	

[1] Crystal City commuter rail station was not counted on this corridor as it was counted in the I-95/I395 corridor on page 7

[2] Metrorail ridership at Van Dorn station was not accounted for on this corridor as it was counted in the I-95/I395 corridor page 7

Conclusion

The Beltway Cordon count, as well as the Metro Core Cordon count, provides two separate data sets. Therefore, a comparison between these two reports will not yield plausible observations. The two counts are defined differently, are conducted in different years, and use different methods and counting stations for data collection.

The intent of the summary tables in this report is to show corridor specific mode share distributions in Northern Virginia.

The data collection for these reports is conducted on single weekdays. Therefore, the reports depict only an 'instance' of the current peak period traffic patterns. Based on these observations, transit is capturing a solid share both in the region and in Northern Virginia. As shown above, in Northern Virginia, transit mode split ranges from 14 percent to about 60 percent in the individual corridors reviewed here in which transit investments have been made. HOV usage is also strong, capturing about 25 percent or more of the peak-commuting mode split both in Northern Virginia and the Washington Metropolitan Region, and a very impressive 30 - 40 percent in the I-95/395 and I-66 corridors.

Accordingly, when the performance of transit investments is considered in specific corridor commuting markets, the pay-off from the investments, as measured by the share of persons traveling in those markets, is seen to be substantial.

Appendix A: Mode Share and Access Resource List

1. **1994 MWCOG Household Survey** - This is an origin-destination survey containing total person trips in the Washington region (auto, walking, transit, school bus, bike, taxi, other), trip purpose distribution, average trip length, travel time, transit use percentages, and average vehicle occupancies.
2. **1996 MWCOG Metro Core Cordon Count** - This is a traffic count that is done by MWCOG on a three-year cycle. It contains one-day, peak period/direction counts of total persons crossing the Core Cordon line, total vehicles (transit bus, commuter bus, metro, commuter rail, vanpools, cars, trucks, motorcycles) crossing the Core Cordon line, and vehicle occupancy.
3. **1997 Board of Trade Reports** - This is a series of reports published in 1997 detailing the results of the Board of Trade's Regional Transportation Study. They contain general mode split for the Washington region (SOV, transit, carpool), population and employment growth, vehicle miles traveled by jurisdiction, and other regional transportation data.
4. **1997 VDOT I-66 Inside the Capital Beltway HOV-2 Annual Report** - As one of the stipulations of I-66 remaining HOV-2, VDOT must monitor the performance of the facility inside the Beltway. This report documents the fulfillment of this stipulation, providing peak period volume, average speed, occupancy and violation rates (auto, vanpool, bus, truck motorcycle), and peak period Metro rail boardings. This information is provided for both directions at several counting stations.
5. **1997 VDOT Route 1 Corridor Study** - This report summarizes the findings of a one-time study intended to help guide project development and implementation efforts in the corridor. This report has traffic volumes, through movements, peak hour mode share, travel time and travel speeds, level of service information, and estimated hours of congestion for 1995 and 2020.
6. **1998 MWCOG Beltway Cordon Count** - This traffic count is performed every three years by the Council of Governments. It contains one-day, peak period/direction counts of total persons crossing the Beltway, total vehicles (transit bus, commuter bus, metro, commuter rail, vanpools, cars, trucks, motorcycles) crossing the Beltway, vehicle occupancy.
7. **1998 Performance of Regional HOV Facilities on Interstate Highways in the Washington Region** - MWCOG performs this traffic count on the HOV facilities in the Washington Metropolitan Region every three years. It contains one-day, peak period/direction counts of vehicles (autos, vanpools, motorcycles, transit buses, "other" buses, trucks, metro, commuter rail) on 66, 95/395, 267 and 270, as well as vehicle occupancy and passenger counts.
8. **Capital Beltway MIS (1997)**- This major investment study, commissioned by VDOT provides supporting information to identify the most appropriate types of transportation improvements to the Capital Beltway through 2020. It includes 1990 auto traffic counts and 2020 projected volumes, vehicle trips using the Capital Beltway, O-D info on these trips, and peak hour LOS information.

9. **Dulles Corridor Transportation Study (1997)** - This VDRPT report provides information developed during the course of the Dulles Corridor Transportation Study. It contains MWCOG's round 5.2 employment, household and population forecasts, as well as distribution of daily trips to the airport. The study also includes projected changes in overall traffic volumes in the Dulles Corridor between 1990 and 2020. .
10. **I-66 MIS Final Report (1998)** - This document summarizes the results of VDOT's I-66 corridor MIS. It describes the locally preferred Transportation Investment Strategy and the supporting reasons for it, including average daily auto traffic volumes and traffic growth on I-66, Rt. 29, Rt. 50, Rt. 15, Rt. 234, Rt. 28, Rt. 7100, Rt. 123, Rt. 243, and I-495 for 1985, 1990 and 1996.
11. **I-95/I-395 HOV Restriction Study (1999)** - A one-time study performed by VDOT to assess the utilization of HOV lanes in the I-95/395 corridor and any alternatives to the current situation. It provides HOV v/s non-HOV average auto occupancy, person movements, persons per lane per hour, mean restricted period speeds, and travel time for I-95/I-395. It also includes the number of scheduled transit trips and estimated ridership in the corridor, and mode share information for the corridor (1998 and forecast for 2010). (This report used the same numbers as MWCOG's 1998 HOV count)
12. **Mixing Bowl Marketing Research (1998)**- This report focuses on eliminating trips through Springfield Interchange during the Mixing Bowl construction. It contains origin-destination information and preferred, rather than actual, mode split.
13. **Northern Virginia 2020 Plan (1999)** - This VDOT report gives general information on the planned Northern Virginia transportation projects through 2020 and supporting data. It includes total trips generated in and through the Washington region in 1990 by purpose, mode and vehicle type, origin-destination data, household and employment density, and demographic data.