Route 1 Corridor Bus Study

Final Report
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Prepared for
Northern Virginia Transportation Commission

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EXECUTIVE SUMMARY

Route 1 is a major traffic artery. In addition to carrying high volumes of auto and truck traffic, it also serves buses carrying passengers to and from activities along the corridor and pedestrians walking to and from these activities and the bus stops.

Significant changes are planned for Route 1. A 1997 study for VDOT recommended reconstruction from the Prince William-Stafford County line to the Capital Beltway. The recommended road would be six lanes wide south of Route 235 (WalMart/Multiplex) and eight lanes wide north of Route 235. A median would be provided with turn lanes at intersections. In most locations, the frontage roads would be eliminated. Sidewalks or paths were recommended on both sides of the road. Grade separated interchanges were proposed for five locations in Fairfax County and three locations in Prince William County.

These studies also recommended new transit services and facilities in the Corridor. A study to further define the scope and magnitude of the roadway improvements is now in progress. The study of bus service needs in the Route 1 Corridor was initiated in July of 2000.

These studies, funded by the state through the Northern Virginia Transportation Commission, have considered transit needs and operations in the Route 1 Corridor, addressing both the specific bus services to be operated and the facilities required to support and promote use of these services. The bus studies will complement and provide information to the concurrent highway Corridor Location Studies.

Those who travel Route 1 understand that while bus services are quite good in some sections, especially in the area north of Fort Belvoir, facilities for access to and from the bus and the waiting areas often leave something to be desired.

Proper waiting areas with shelters and benches are provided in some locations,

but often the need to "fit in" the transit facility has led to a less than desirable placement that is too close to the high speed traffic and isolated from nearby activities.

Where no facilities are provided, passengers often make their own accommodation

But in some places, even the most determined bus riders will have difficulty.

There are three agencies providing bus service in the Corridor. WMATA and the Fairfax Connector in Fairfax County, PRTC's OmniRide and OmniLink in Prince William County.

The current bus services are well used. There is crowding at some times on the buses in Fairfax County. Passengers can be seen waiting for buses at all times of day. In Prince William County, the Dumfries service is the most used OmniLink route and is approaching the capacity of a route deviation operation.

The Metropolitan Washington Council of Governments projects that, even without any improvements, transit use in the corridor will increase by 20% over the next two decades due to growth in both population and employment. Fort Belvoir alone may add 15,000 or more workers.

Background Conditions	
Projected Growth 2000 to 2020	
Households	+21% in Fairfax Co., +34 % in Prince William Co.
Employment	+27% in Fairfax Co., +30% in Prince William Co,
VDOT Route 1 Centerline Location Studies	
8 lanes proposed	Beltway to Route 235 (at Buckman Road)
6 lanes proposed	Route 235 to Stafford County

The study process has involved both analytic studies and extensive field work. The studies have involved analysis of the projected development and travel patterns. Guidelines for bus service, similar to those being used in a concurrent WMATA regional bus operations study, were applied. Current operations were compared against these standards. In most locations, existing bus services were found to meet guidelines today and to continue to do so over the next twenty years. In the northern section of the corridor, additional service will be required to provide adequate capacity to serve demand.

Field work included a full inventory of the conditions at all bus stops, review of pedestrian access and riding buses to record both travel times and the causes of delay.

The study team met in two rounds with representatives of groups with an interest in the Corridor; in the initial first round to hear views on services and needs and in a second round to receive comments on a proposed service and facilities enhancements plan. The recommended plan reflects those comments

The Recommended Plan includes four primary elements.

- New and expanded bus services
- Improvements to bus stops coupled with facilities to permit safer access to bus stops including sidewalks, crosswalks and pedestrian signals.
- "Transit Centers" in selected locations with Park-Ride at the Multiplex, Beacon Mall and Michael's. Details of providing park-ride will need to be negotiated with the owners.
- Use of Intelligent Transportation Systems (ITS) technology to provide bus information to passengers and to support preferential treatment for buses at traffic signals

Sidewalk and bus stop improvements are suggested for inclusion in the larger Route 1 reconstruction project as is the provision for bus priority at traffic signals.

Bus Service enhancements in Fairfax County would include:

- Route 105 - 12 minute peak frequency, Saturday evening service
- Route 105 - Saturday service to Lorton
- Route 105 X - Express service from Multiplex to/from Huntington
- Route 107 - 4 buses per hour in weekday peak hours
- Route 202 or 303 - Midday service Lorton/Belvoir to/from Springfield

In Prince William County the recommendations are for:

- additional trips on the Route 1 OmniRide Commuter service coupled with Park- Ride at Murumsco Plaza
- a new OnmiLink route from Dumfries to Woodbridge

Other recommended bus service improvements are:

- A bus connection between VRE commuter rail and Fort Belvoir to tap the market of those who live in Stafford and Spottsylvania Counties but work at Fort Belvoir.
- Bus service connecting Fairfax and Prince William Counties, operating along Route 1 from Huntington to Potomac Mills, to serve commuters to Fort Belvoir, as well as connecting residents of the corridor in Fairfax County to job and shopping opportunities at Potomac Mills.

Accommodations for bus riders are often lacking along the corridor. Here, where there is a shelter for southbound passengers but no shelter or bench for northbound passengers, the bus riders have made their own accommodation.

The concept plan recommends bus stop enhancement at 62 locations in Fairfax County (31 NB, 31 SB) with shelters at 30 of these.

PASSENGER FACILITY RECOMMENDATIONS	
Improved Bus Stops with:	
	Paved waiting area
	Passenger information
	Benches and shelters at higher use stops
Transit Centers:	
	Off-street
	Major centers have enclosed waiting areas
	Real-time bus information by use of ITS

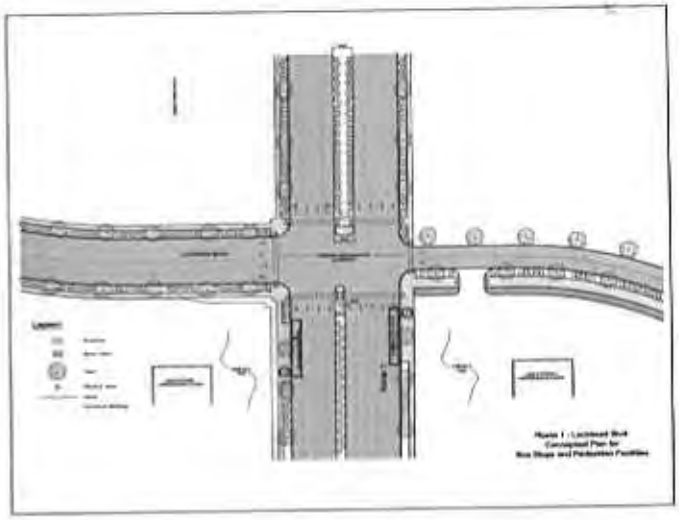
Off-street "transit centers" are suggested at Beacon Mall (to reduce the need to cross the road) and Fort Belvoir (to facilitate transfers).

Minor transit centers, off-street with shelters, are recommended in Fairfax County at the new Southeast Government Center, the Multiplex and at Michaels. In Prince William County, a new Transit Center is proposed to serve both OnmiLink and Greyhound in Triangle outside the Quantico Marine Corps Base. Real-time information would be available at the transit centers.

A typical bus stop serving 50 or more passengers per day should look something like the bus stop illustrated here.

Pedestrians should not be enticed to cross multiple lanes of traffic at unprotected locations. Safe and protected places to cross the road are an integral element of the bus service plan. The recommended plan suggests signals and illuminated crosswalks within 250 feet of all bus stops.

Concept plans illustrate how this might be done at selected locations.

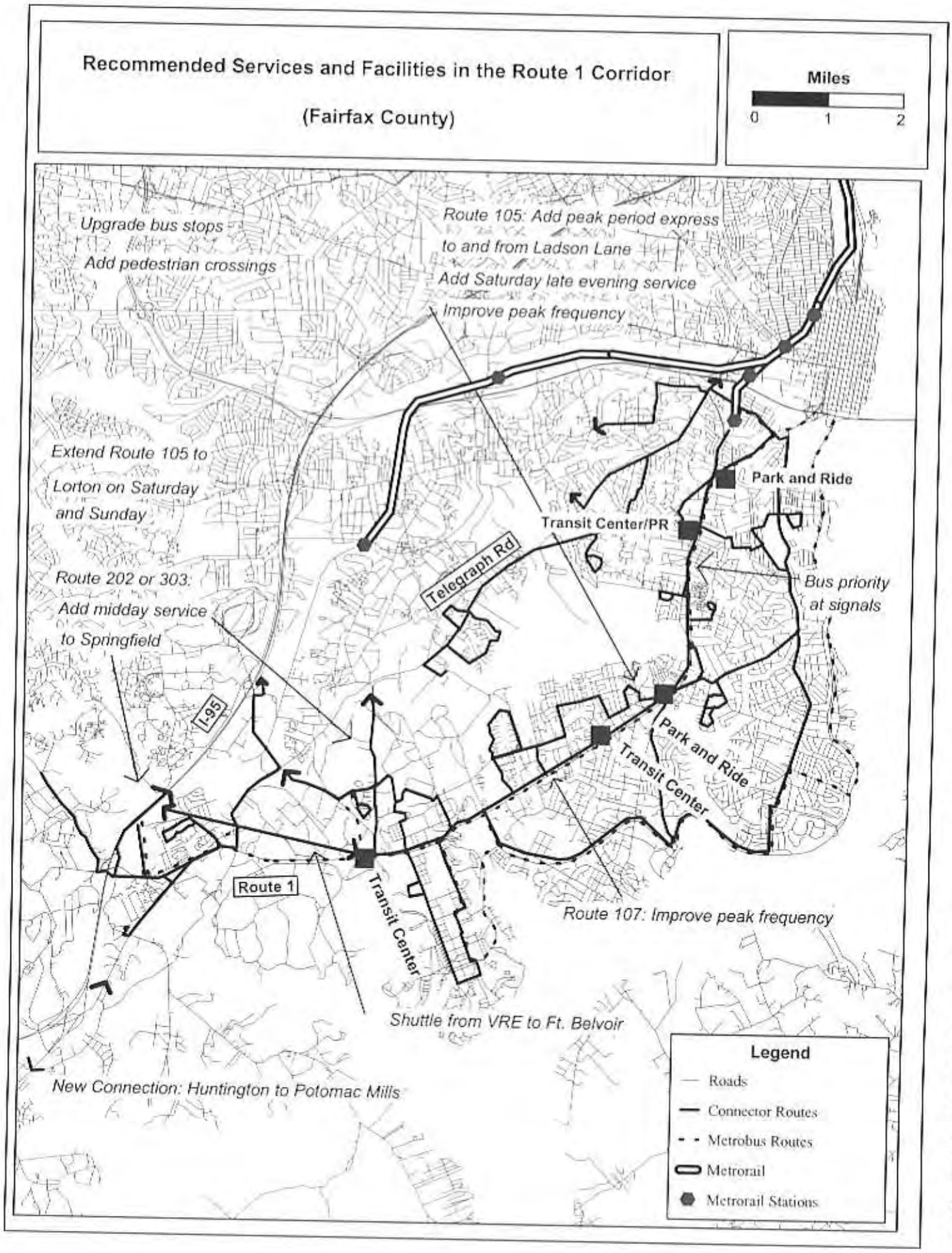


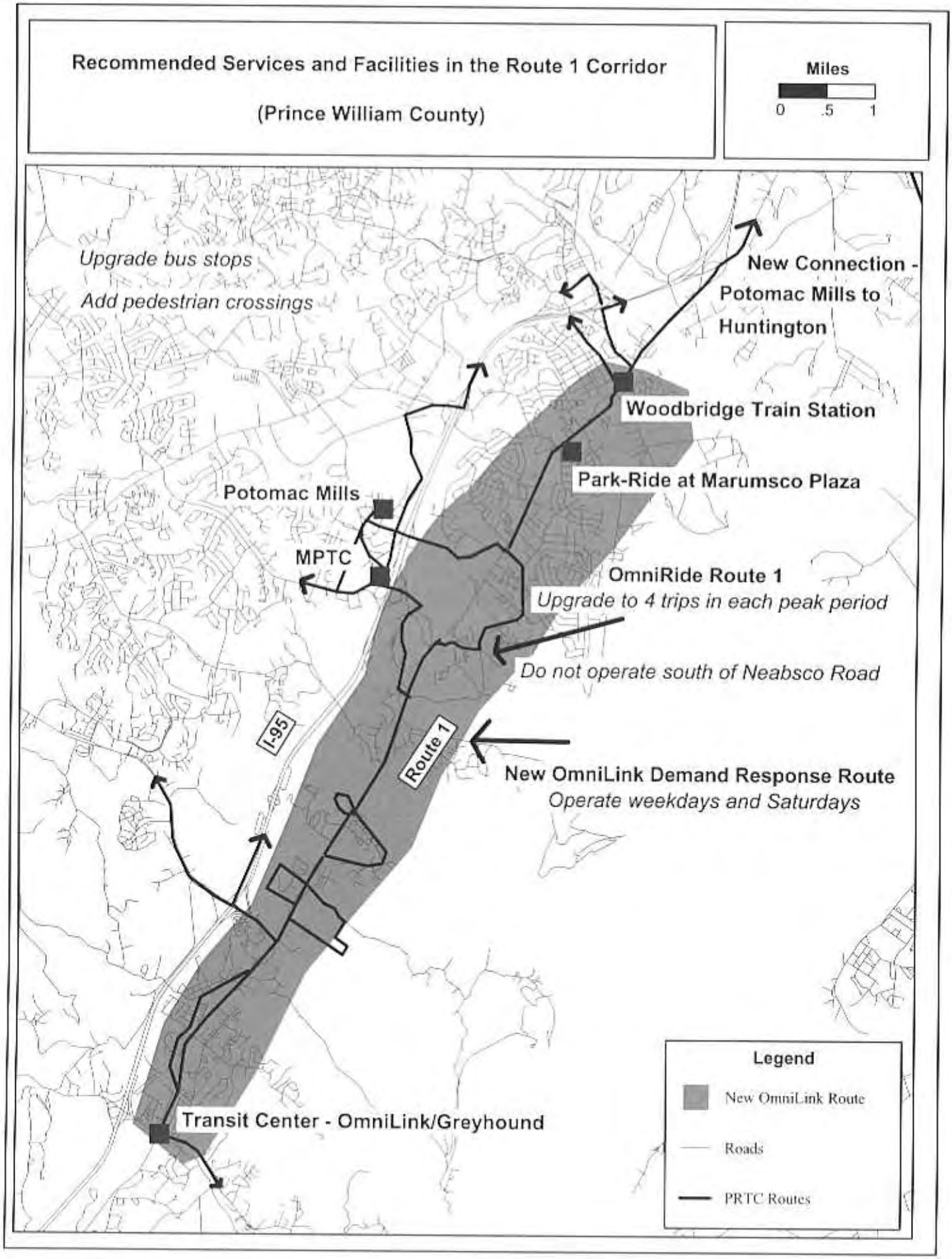
Implementation of the recommended physical facilities - bus stops, benches and shelters, off-street "transit centers", and enhanced pedestrian crossings - is estimated to cost $7.3 million. Standard pedestrian crossings, sidewalks and paths are proposed as part of the roadway improvement project. The sidewalk areas would provide the paved surface at bus stops.

The cost for additional bus services, over and above those being provided today, is estimated to be $2.6 million per year, depending in part on which option is selected for serving specific markets.

Some of the recommended service improvements (e.g. Saturday evening operation of Fairfax Connector Route 105) can be operated with vehicles from the existing fleet. Other services that will operate in peak hours may require additional vehicles depending on how the operation meshes with the other scheduled operations. It is estimated that the Fairfax County services would require eight new buses, the Prince William services would require five new buses and the other services would also require five buses.

Several of the bus service enhancements required to respond to current rider demand are recommended for implementation as soon as practicable. These include the expansion of Fairfax Connector Route 105 and the new Triangle-Woodbridge OmniLink route. Other bus service changes will be needed by 2020 to keep pace with growth. The provision of sidewalks, crosswalks, pedestrian signals and bus stop improvements is required now in many locations. They should be implemented as soon as practicable and included as an integral element of the Route 1 highway reconstruction projects.


Recommended Services and Facilities in the Route 1 Corridor
(Fairfax County)
Miles
0
1
2
Upgrade bus stops
Add pedestrian crossings
Route 105: Add peak period express
to and from Ladson Lane
Add Saturday late evening service
Improve peak frequency
Extend Route 105 to
Lorton on Saturday
and Sunday
Route 202 or 303:
Add midday service
to Springfield
Park and Ride
Transit Center/PR
Telegraph Rd
Bus priority
at signals
I-95
Park and Ride
Transit Center
Route 1
Transit Center
Route 107: Improve peak frequency
Shuttle from VRE to Ft. Belvoir
New Connection: Huntington to Potomac Mills
Legend
Roads
Connector Routes
Metrobus Routes
Metrorail
Metrorail Stations


Recommended Services and Facilities in the Route 1 Corridor
(Prince William County)
Miles
0 .5 1
Upgrade bus stops
Add pedestrian crossings
New Connection - Potomac Mills to Huntington
Woodbridge Train Station
Park-Ride at Marumsco Plaza
Potomac Mills
MPTC
OmniRide Route 1
Upgrade to 4 trips in each peak period
Do not operate south of Neabsco Road
I-95
Route 1
New OmniLink Demand Response Route
Operate weekdays and Saturdays
Transit Center - OmniLink/Greyhound
Legend
New OmniLink Route
Roads
PRTC Routes

I. INTRODUCTION

U.S. Route 1, also called Richmond Highway in Fairfax County and Jefferson Davis Highway in Prince William County, is the historic roadway connection south from Washington DC. Prior to the construction of the Shirley Highway and, later, I-95, Route 1 was the primary road for long distance travel. The design of the road and the uses of land abutting the road reflected the orientation to serving long distance travelers. Following the construction of the Shirley Highway, long distance travel was able to by-pass the portion of Route 1 in Fairfax County. The function of Route 1 shifted to serving commuting traffic for the expanding suburban development and the commercial locations of businesses serving that development. In Prince William County, the history is slightly different. Interstate 95 was constructed later and suburban development was later in arriving, but the result has been much the same. Route 1 is a major roadway originally designed to serve long distance traffic operating at high speed in a rural environment, but now serving suburban local and commuting traffic with significant abutting commercial development.

As in many similar situations across the nation, when the function of the road changed, many of the abutting commercial uses lost viability. As the value of the business declined, the corridor lost both value and attractiveness. Reversing these trends requires recognizing the current role for the Route 1 corridor, attracting commercial investment suited to the current nature of the corridor, and providing transportation facilities and services that support the desired development.

Route 1 from the Capital Beltway in Fairfax County to the Quantico Marine Corps base in Prince William County is about to undergo a major change. Studies of the Route 1 corridor commissioned by VDOT have considered the range of actions necessary to bring the roadway into better conformity with its role as a suburban arterial serving local retail and commercial activity. Detailed design and environmental studies are now in progress. In this new role, Route 1 must serve not only as a facility for privately owned motor vehicles, but also as the spine for public transportation operations serving commercial centers along the roadway and residential areas abutting the corridor. To properly serve this latter function, the roadway design and the transit strategies must be coordinated. This is necessary so that proper accommodations, ranging from bus turnouts to pedestrian crossings, are provided.

A plan for transit actions to accompany the roadway improvements is presented in this report. These recommendations have been developed based on a review of existing land uses and anticipated developments throughout the corridor, inventory and inspection of current transit services and supporting facilities, and an extensive stakeholder outreach program. The recommendations represent a vision of the way bus transit can function in the reconstructed and revitalized Route 1.

II. EXISTING AND PROJECTED CORRIDOR CONDITIONS

HOUSING AND EMPLOYMENT

Housing

Table 1 displays household data and projections for 2000, 2010 and 2020 as developed by the Metropolitan Washington Council of Governments (MWCOG). The study corridor currently (2000) has 65,736 households; 44,911 in Fairfax County, and 20,825 households in Prince William County. Exhibit 1 illustrates households per acre for 2000. The area surrounding the Huntington Metrorail station, currently has over 8 households per acre. Other areas with significant densities, 4 to 8 households per acre, are located along the western side of Route 1, north of Woodlawn Road.

Exhibit 2 illustrates household densities projected for 2010. Significant changes projected are:

- The density of the area located between I-95 and Route 1, north of Lorton Road and south of Pohick Road, will increase from 2 to 4 households per acre in 2000 to 4 to 8 households in 2010.
- The density of the area located between I-95 and Route 1, north of Old Colchester Road and south of Lorton Road, will increase from 0 to 2 households per acre in 2000 to 4 to 8 households per acre in 2010.
- The density of the area located east of Route 1 and north of Cherry Hill Road will increase from 0 to 2 households per acre in 2000 to 4 to 8 households per acre in 2010.

These general trends continue in the period 2010 to 2020.

Exhibit 3 illustrates projected rate of growth in the number of households from 2000 to 2020. In Exhibit 3, several areas in both Fairfax and Prince William Counties are projected to have an increase of over 50% in households.

Overall, households in the corridor are projected to increase from 65,736 in 2000 to 82,442 in 2020, a growth of 25.4%, slightly less than the Washington region's projected 29% growth in households. Over the 20 year span, households in Prince William are projected to increase by 34.3%, while households in Fairfax will increase by 21.3%.

Employment

Table 2 displays employment by Traffic Analysis Zone (TAZ) for 2000, 2010 and 2020. The study corridor today has 81,660 jobs; 51,096 in Fairfax County and 30,564 in Prince William County. Exhibit 4 illustrates employment per acre for 2000.

Table 1
Households Located in the Route 1
Corridor Study Area of Fairfax and Prince William Counties
(Analysis Conducted at the Traffic Analysis Zone Level for 2000 and 2020)

Traffic Analysis Zone	Square Miles	Households 2000	Households 2010	Households 2020	Growth Percentage
1469	0.34	1,570	1,620	1,669	6.3%
1480	0.51	1,653	1,677	1,701	2.9%
1468	0.44	3,175	3,327	3,478	9.5%
1476	1.15	342	353	363	6.1%
1470	0.91	1,282	1,321	1,360	6.1%
1481	1.10	1,172	1,212	1,251	6.7%
1471	0.74	2,366	2,559	2,751	16.3%
1473	0.84	1,472	1,498	1,523	3.5%
1475	1.52	2,091	2,152	2,213	5.8%
1482	0.73	1,336	1,344	1,351	1.1%
1483	2.59	551	559	566	2.7%
1474	1.54	3,122	3,335	3,547	13.6%
1472	0.72	1,896	2,323	2,750	45.0%
1559	1.05	514	549	584	13.6%
1484	0.71	675	676	677	0.3%
1558	0.87	1,030	1,051	1,072	4.1%
1561	2.34	0	0	0	0.0%
1551	1.53	4,498	5,149	5,799	28.9%
1557	1.09	1,691	1,912	2,133	26.1%
1560	2.51	412	415	418	1.5%
1555	1.18	1,040	1,112	1,184	13.8%
1553	1.33	1,576	1,727	1,877	19.1%
1569	0.93	563	630	697	23.8%
1556	2.46	2,483	2,617	2,750	10.8%
1635	2.51	0	0	0	0.0%
1552	0.75	2,099	2,782	3,465	65.1%
1562	1.46	0	0	0	0.0%
1554	3.42	1,497	1,631	1,765	17.9%
1637	0.89	1,762	2,338	2,914	65.4%
1564	5.34	0	0	0	0.0%
1636	1.39	984	1,320	1,656	68.3%
1639	0.77	303	324	344	13.5%
1563	4.93	0	0	0	0.0%
1638	0.94	979	1,346	1,713	75.0%
1640	18.94	741	803	865	16.7%
1641	0.84	36	38	40	11.1%
TOTAL FAIRFAX	**71.28**	**44,911**	**49,694**	**54,476**	**21.3%**
1920	1.73	2,813	2,913	3,013	7.1%
1925	5.16	792	1,197	1,602	102.3%
1921	1.61	1,838	1,838	1,838	0.0%
1924	1.28	1,967	1,967	1,967	0.0%
1923	3.72	2,570	2,722	2,873	11.8%
1922	1.55	178	178	178	0.0%
1980	1.62	802	1,362	1,921	139.5%
1985	3.76	1,117	1,404	1,690	51.3%
1986	1.42	1,746	2,687	3,628	107.8%
1987	1.88	35	350	665	1800.0%
1984	4.62	896	1,539	2,181	143.4%
1981	1.27	780	780	780	0.0%
1983	4.13	2,437	2,607	2,776	13.9%
1982	8.30	2,854	2,854	2,854	0.0%
TOTAL PRINCE WILLIAM	**42.03**	**20,825**	**24,396**	**27,966**	**34.3%**
TOTAL CORRIDOR	**113.32**	**65,736**	**74,089**	**82,442**	**25.4%**

*Data Source: Metropolitan Washington Council of Governments (Round 6)
Year 2010 data estimated by interpolation

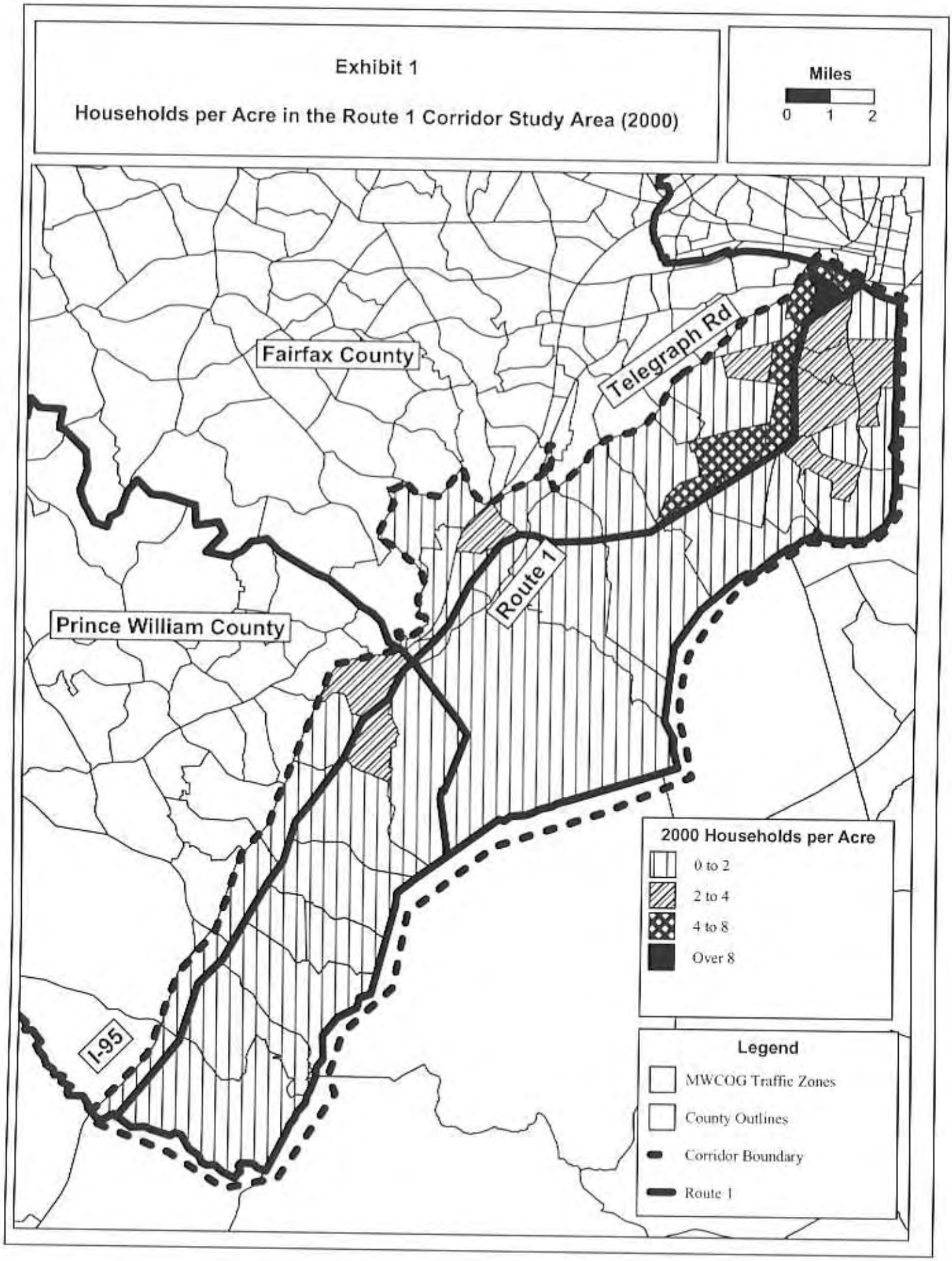


Exhibit 1
Households per Acre in the Route 1 Corridor Study Area (2000)
Miles
0 1 2
Fairfax County
Telegraph Rd
Route 1
Prince William County
I-95
2000 Households per Acre
0 to 2
2 to 4
4 to 8
Over 8
Legend
MWCOG Traffic Zones
County Outlines
Corridor Boundary
Route 1

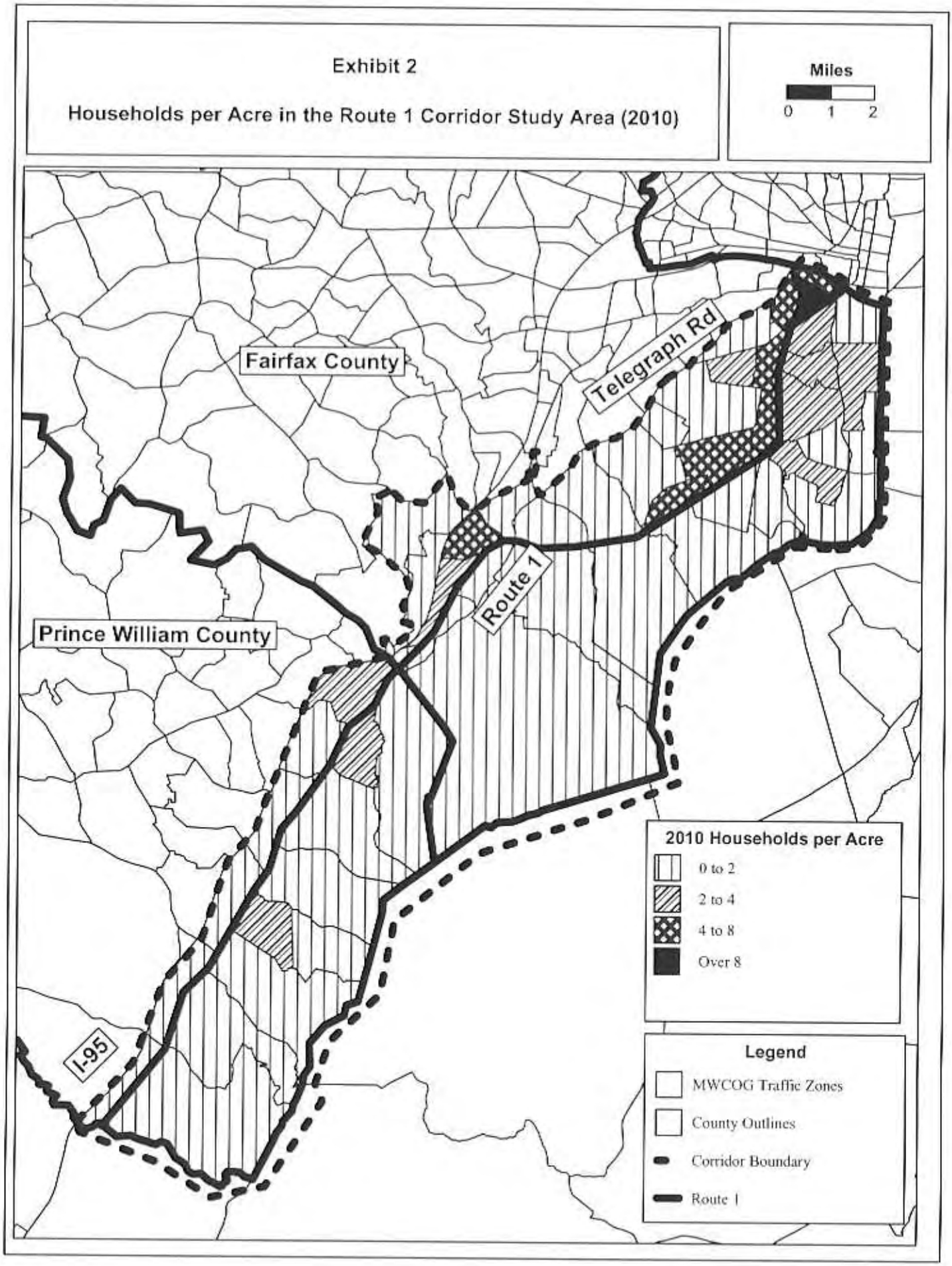


Exhibit 2
Households per Acre in the Route 1 Corridor Study Area (2010)
Miles
0 1 2
Fairfax County
Telegraph Rd
Route 1
Prince William County
I-95
2010 Households per Acre
0 to 2
2 to 4
4 to 8
Over 8
Legend
MWCOG Traffic Zones
County Outlines
Corridor Boundary
Route 1

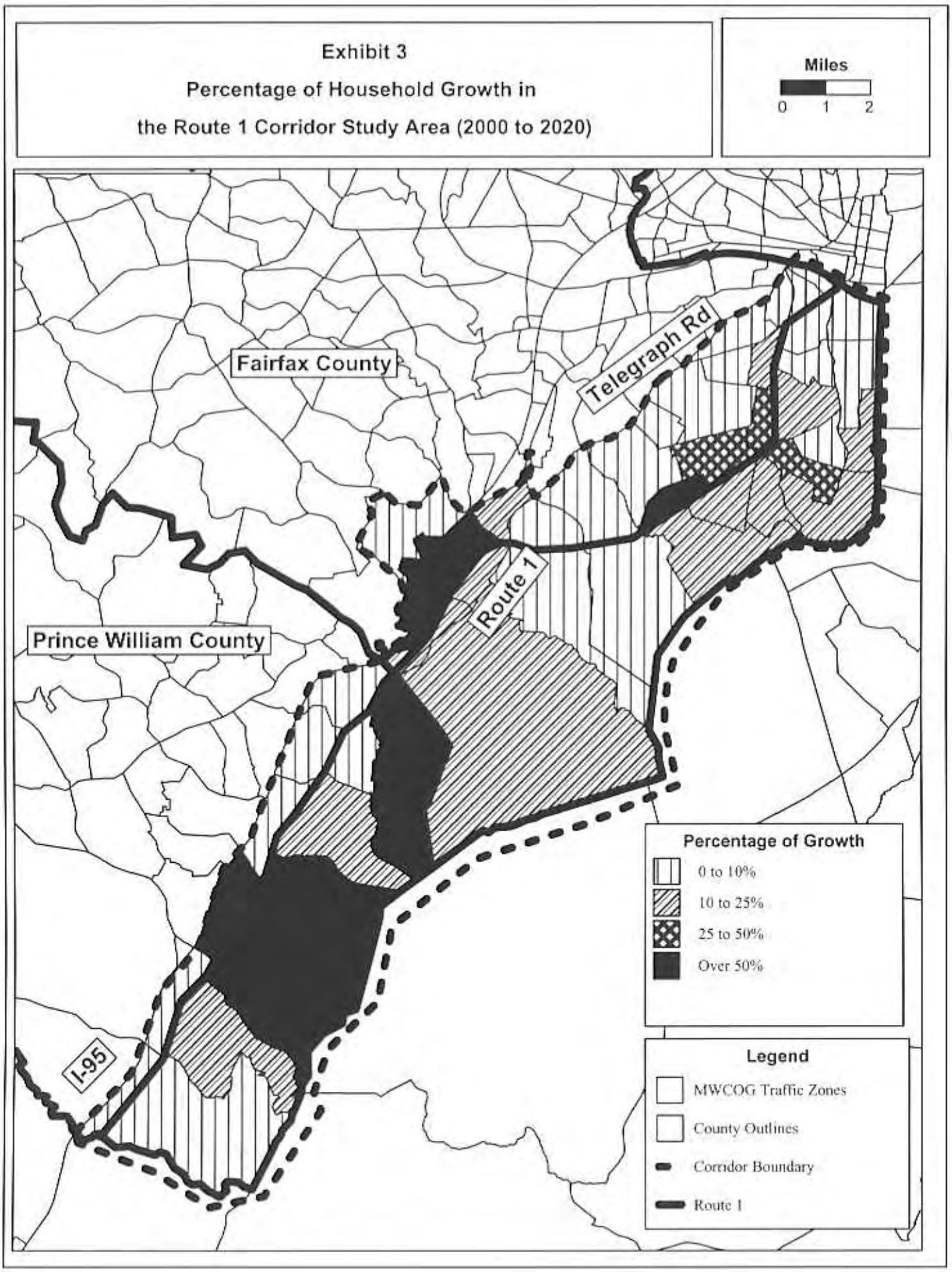


Exhibit 3
Percentage of Household Growth in
the Route 1 Corridor Study Area (2000 to 2020)
Miles
0 1 2
Fairfax County
Telegraph Rd
Route 1
Prince William County
I-95
Percentage of Growth
0 to 10%
10 to 25%
25 to 50%
Over 50%
Legend
MWCOG Traffic Zones
County Outlines
Corridor Boundary
Route 1

Table 2
Employment Located in the Route 1
Corridor Study Area of Fairfax and Prince William Counties
(Analysis Conducted at the Traffic Analysis Zone Level for 2000 and 2020)

Traffic Analysis Zone	Square Miles	Employment 2000	Employment 2010	Employment 2020	Growth Percentage
1469	0.34	1,607	1,938	2,268	41.1%
1480	0.51	1,302	1,371	1,440	10.6%
1468	0.44	1,134	1,350	1,565	38.0%
1476	1.15	785	792	798	1.7%
1470	0.91	1,577	1,761	1,945	23.3%
1481	1.10	535	546	557	4.1%
1471	0.74	1,847	2,216	2,585	40.0%
1473	0.84	597	632	667	11.7%
1475	1.52	248	255	262	5.6%
1482	0.73	176	186	195	10.8%
1483	2.59	105	109	112	6.7%
1474	1.54	1,134	1,196	1,258	10.9%
1472	0.72	2,294	2,430	2,566	11.9%
1559	1.05	56	58	59	5.4%
1484	0.71	364	377	390	7.1%
1558	0.87	386	389	391	1.3%
1561	2.34	3,166	3,457	3,747	18.4%
1551	1.53	910	998	1,086	19.3%
1557	1.09	2,142	2,207	2,272	6.1%
1560	2.51	7,621	8,126	8,631	13.3%
1555	1.18	98	111	124	26.5%
1553	1.33	1,263	1,234	1,204	-4.7%
1569	0.93	2,517	2,782	3,047	21.1%
1556	2.46	376	386	396	5.3%
1635	2.51	457	434	410	-10.3%
1552	0.75	1,097	1,183	1,269	15.7%
1562	1.46	3,476	3,350	3,223	-7.3%
1554	3.42	1,455	1,541	1,627	11.8%
1637	0.89	166	592	1,017	512.7%
1564	5.34	9,351	10,045	10,738	14.8%
1636	1.39	255	347	439	72.2%
1639	0.77	580	649	717	23.6%
1563	4.93	0	1,988	3,976	0.0%
1638	0.94	1,697	2,279	2,861	68.6%
1640	18.94	144	148	151	4.9%
1641	0.84	178	604	1,029	478.1%
TOTAL FAIRFAX	71.28	51,096	58,059	65,022	27.3%
1920	1.73	3,943	4,111	4,278	8.5%
1925	5.16	1,271	1,899	2,527	98.8%
1921	1.61	3,169	3,240	3,310	4.4%
1924	1.28	2,018	2,018	2,018	0.0%
1923	3.72	2,681	2,806	2,930	9.3%
1922	1.55	2,092	3,343	4,594	119.6%
1980	1.62	339	339	339	0.0%
1985	3.76	97	153	209	115.5%
1986	1.42	340	612	884	160.0%
1987	1.88	26	872	1,717	6503.8%
1984	4.62	649	1,577	2,505	286.0%
1981	1.27	1,557	1,575	1,592	2.2%
1983	4.13	1,271	1,331	1,390	9.4%
1982	8.30	11,111	11,298	11,484	3.4%
TOTAL PRINCE WILLIAM	42.03	30,564	35,171	39,777	30.1%
TOTAL CORRIDOR	113.32	81,660	93,230	104,799	28.3%

*Data Source: Metropolitan Washington Council of Governments (Round 6)
Year 2010 data estimated by interpolation

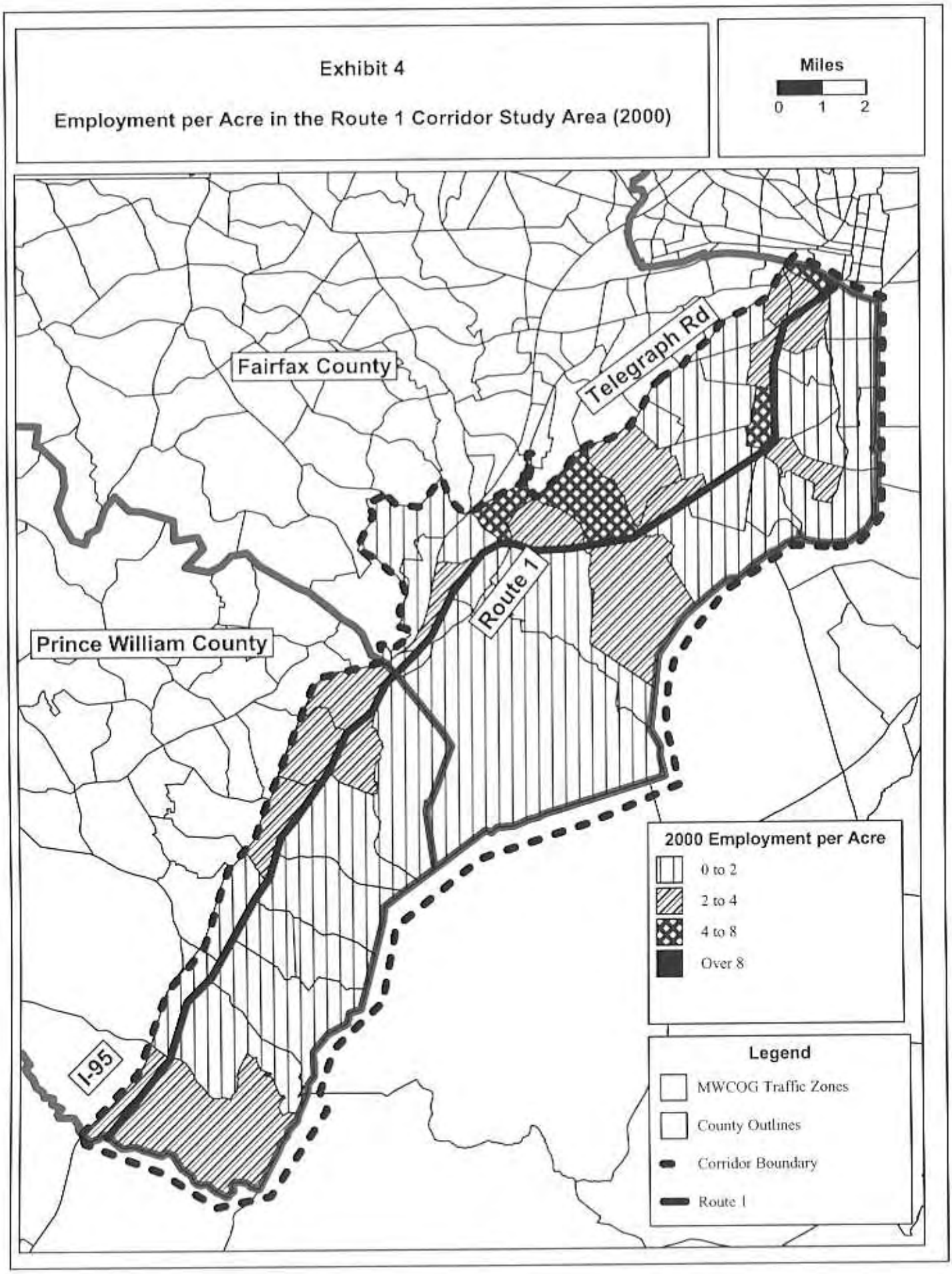


Exhibit 4
Employment per Acre in the Route 1 Corridor Study Area (2000)
Miles
0 1 2
Fairfax County
Telegraph Rd
Route 1
Prince William County
I-95
2000 Employment per Acre
0 to 2
2 to 4
4 to 8
Over 8
Legend
MWCOG Traffic Zones
County Outlines
Corridor Boundary
Route 1

Exhibit 5 illustrates the estimated employment per acre for 2010. One significant change from the 2000 employment patterns is the increase from 4 to 8 jobs per acre to over 8 jobs per acre in the area located south of the Fairfax/Alexandria border, north of Huntington Avenue, west of Route 1 and east of Telegraph Road.

Exhibit 6 represents the projected employment growth from 2000 to 2020.

Overall, jobs for the study area are projected to increase from 81,660 in 2000 to 104,799 in 2020, a growth of 28.3%, almost equal to the projected 30% job growth for the entire Washington region. Over half of this increase is likely to be at Fort Belvoir.

TRAVEL DEMAND

Home-based Work Transit Trips

Projected changes in transit use in the corridor were examined using forecasts developed by the Metropolitan Washington Council of Governments. Travel model data were tabulated for home-based work trip productions and trip attractions by mode. Table 3 displays home-based work transit trips produced in each traffic analysis zone identified as part of the Route 1 Corridor. The number of trips made by walking or driving to/from transit is identified for 2000 and 2010. The Fairfax County portion of the corridor is estimated to produce 19,311 home-based work transit trips in 2000 and an estimated 22,891 trips by 2010. The Prince William County portion of the corridor is estimated to produce 2,247 transit trips in 2000 growing to an estimated 3,574 trips in 2010.

On average, work trips made by transit are projected to increase by about 19% in the Fairfax County portion of the corridor and by almost 60% in the Prince William portion. For 2000 and 2010, Table 4 summarizes the attraction areas for home-based work transit trips produced in the Route 1 Corridor. For the year 2000, the primary attraction area for trips produced in the corridor is the DC core – attracting 8,782 trips from Fairfax County portions of the corridor and 1,168 trips from Prince William portions of the corridor. The DC core remains the highest attraction area in 2010 attracting 9,944 trip from Fairfax County corridor locations and 1,607 trips from Prince William locations.

Table 5 summarizes projected changes in travel to work locations in the Route 1 corridor. As would be expected, the transit market shares are far lower for work travel to the corridor than for travel from the corridor, recognizing that the nature of development is less dense and employee parking is not a problem at corridor locations. Even so, both the number of transit trips for travel to corridor work locations and the transit market share show increases.

Travel Generators

The demand for transit service along the Route 1 corridor arises not only from people traveling to and from work, but also from corridor residents traveling to fulfil a variety of needs, including education, shopping, medical visits and participation in social service programs. Exhibits 7 and 8 illustrate the locations along the corridor of existing travel generators, such as shopping areas, employment sites and hospitals.

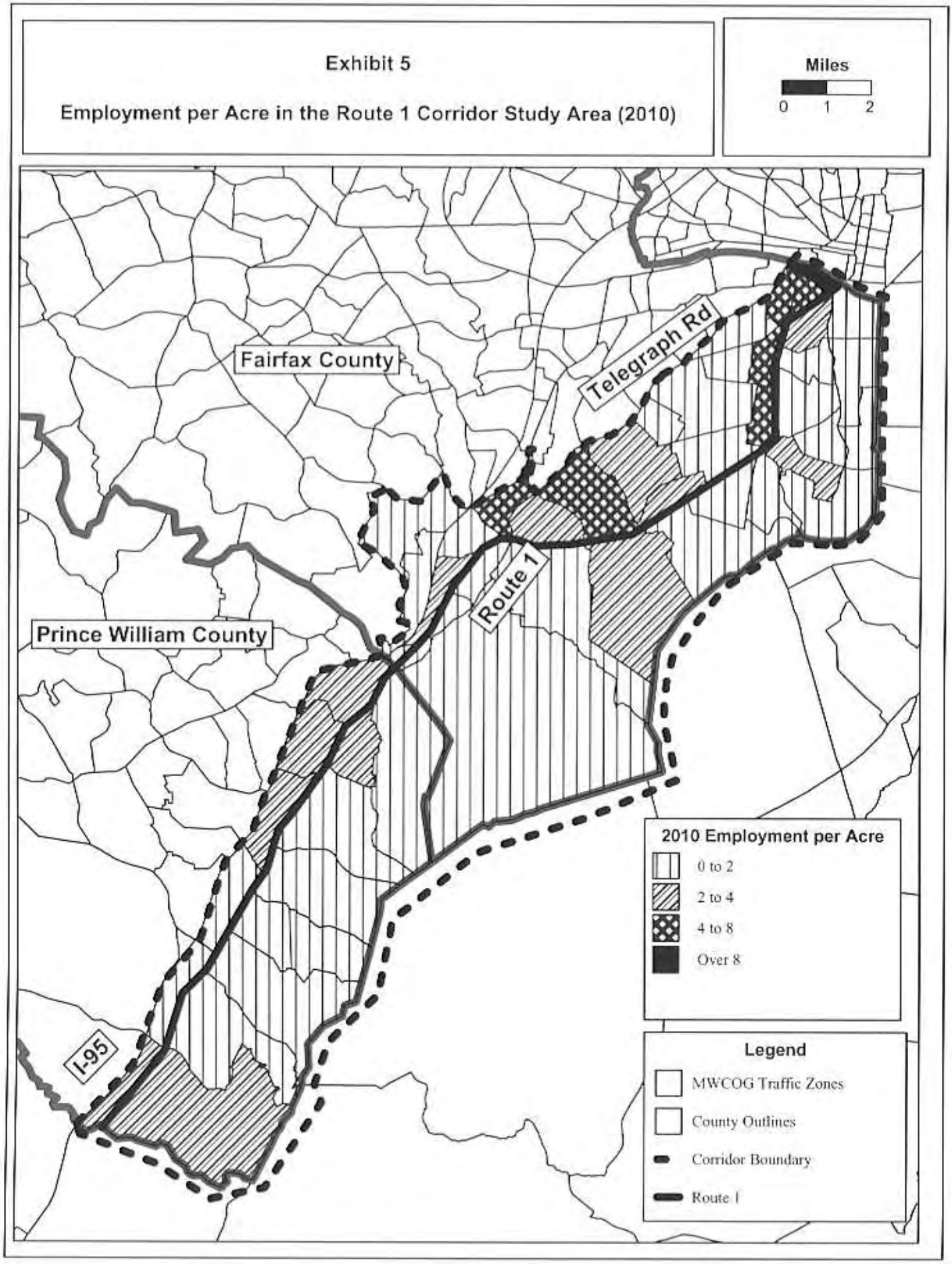


Exhibit 5
Employment per Acre in the Route 1 Corridor Study Area (2010)
Miles
0 1 2
Fairfax County
Telegraph Rd
Route 1
Prince William County
I-95
2010 Employment per Acre
0 to 2
2 to 4
4 to 8
Over 8
Legend
MWCOG Traffic Zones
County Outlines
Corridor Boundary
Route 1

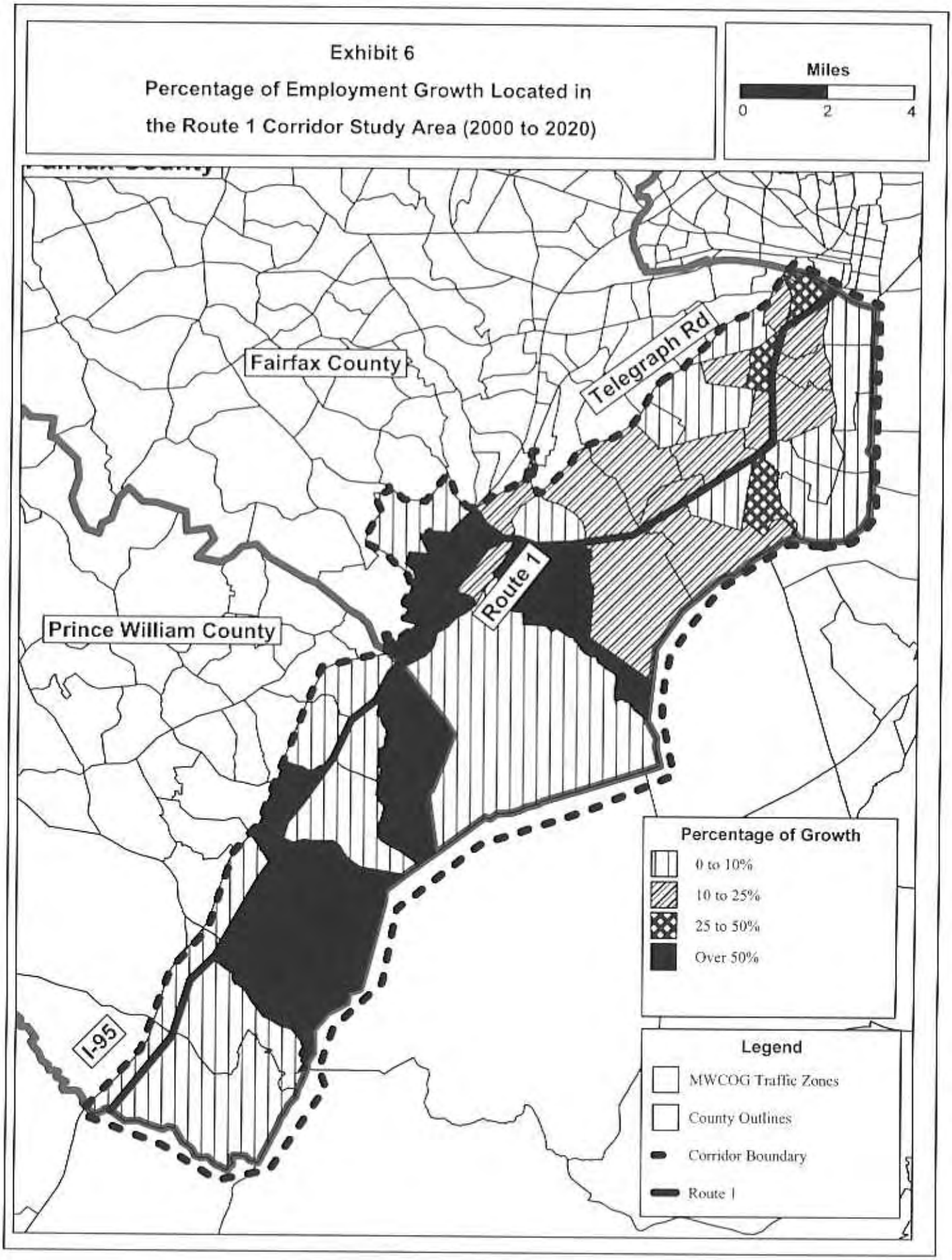


Exhibit 6
Percentage of Employment Growth Located in
the Route 1 Corridor Study Area (2000 to 2020)
Miles
0
2
4
Fairfax County
Telegraph Rd
Route 1
Prince William County
I-95
Percentage of Growth
0 to 10%
10 to 25%
25 to 50%
Over 50%
Legend
MWCOG Traffic Zones
County Outlines
Corridor Boundary
Route 1

Table 3
Route 1 Corridor Bus Study
MWCOG Home-Based Work Trip Forecasts
Trip Productions and Mode Shares

Traffic Analysis Zone	HB Work Person Trip Productions		HB Work Transit Trip Productions		HB Work Percent Transit Productions	
	Year 2000	Year 2010	Year 2000	Year 2010	Year 2000	Year 2010
Fairfax Co.						
1468	5,457	6,152	1,854	2,148	34.0%	34.9%
1469	2,713	3,083	885	1,019	32.6%	33.1%
1470	2,426	2,383	641	648	26.4%	27.2%
1471	4,243	4,792	1,112	1,312	26.2%	27.4%
1472	3,326	4,439	819	1,133	24.6%	25.5%
1473	2,427	2,747	610	719	25.1%	26.2%
1474	5,460	6,169	1,260	1,461	23.1%	23.7%
1475	3,633	4,097	787	922	21.7%	22.5%
1476	602	342	134	77	22.3%	22.5%
1480	3,537	3,539	1,044	1,058	29.5%	29.9%
1481	2,529	2,658	534	570	21.1%	21.4%
1482	2,855	2,818	692	678	24.2%	24.1%
1483	1,170	1,236	213	217	18.2%	17.6%
1484	1,348	1,580	253	309	18.8%	19.6%
1551	8,894	10,857	1,938	2,560	21.8%	23.6%
1552	4,292	5,811	922	1,302	21.5%	22.4%
1553	3,319	3,487	633	777	19.1%	22.3%
1554	2,964	3,484	705	879	23.8%	25.2%
1555	1,977	2,319	516	596	26.1%	25.7%
1556	4,936	5,418	1,111	1,187	22.5%	21.9%
1557	3,643	4,271	847	1,010	23.3%	23.6%
1558	1,966	2,310	396	492	20.1%	21.3%
1559	1,002	780	223	183	22.3%	23.5%
1560	259	252	36	36	13.9%	14.3%
1561	35	59	6	13	17.1%	22.0%
1562	13	19	3	2	23.1%	10.5%
1563	0	0	0	0	--	NA
1564	469	451	89	84	19.0%	18.6%
1569	1,172	1,301	137	194	11.7%	14.9%
1635	682	849	109	135	16.0%	15.9%
1636	526	852	31	55	5.9%	6.5%
1637	3,527	4,758	311	503	8.8%	10.6%
1638	2,021	2,801	215	317	10.6%	11.3%
1639	606	678	25	29	4.1%	4.3%
1640	1,469	1,706	209	266	14.2%	15.6%
1641	73	0	11	0	15.1%	--
Subtotal	85,571	98,498	19,311	22,891	22.6%	23.2%
Prince William County						
1920	5,419	5,866	171	292	3.2%	5.0%
1921	3,602	3,980	226	277	6.3%	7.0%
1922	398	466	11	15	2.8%	3.2%
1923	5,002	5,867	250	431	5.0%	7.3%
1924	3,802	3,981	76	122	2.0%	3.1%
1925	1,807	3,289	107	236	5.9%	7.2%
1980	1,401	2,752	58	135	4.1%	4.9%
1981	1,396	1,517	55	67	3.9%	4.4%
1982	6,448	7,339	728	811	11.3%	11.1%
1983	4,218	4,893	167	235	4.0%	4.8%
1984	1,620	3,663	115	289	7.1%	7.9%
1985	1,999	3,053	106	146	5.3%	4.8%
1986	3,012	6,714	177	473	5.9%	7.0%
1987	0	610	0	45	--	7.4%
Subtotal	40,124	53,990	2,247	3,574	5.6%	6.6%
Total	125,695	152,488	21,558	26,465	17.2%	17.4%

Table 4

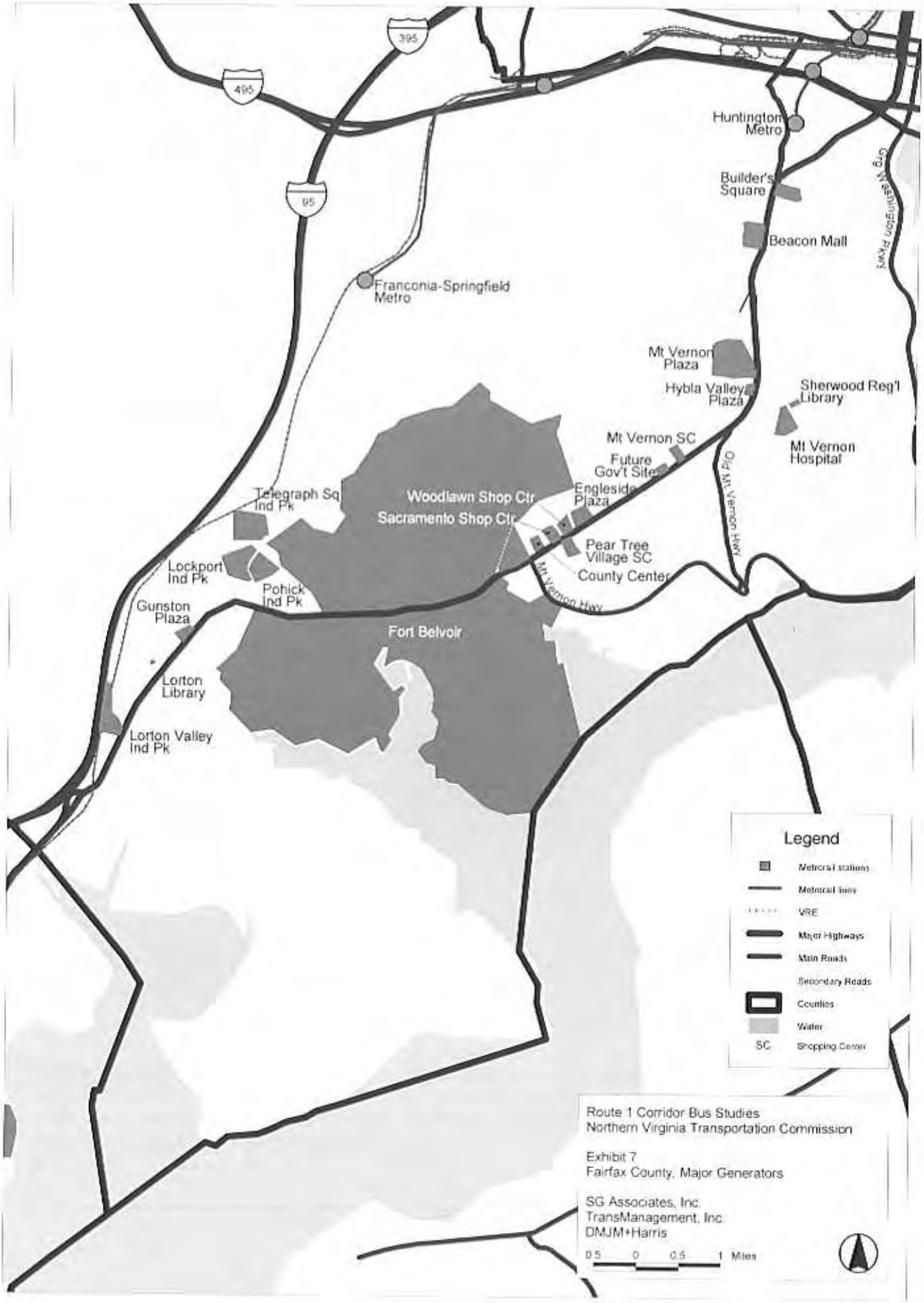
MWCOG Transit Trip Forecasts
Home Based Work Transit Trips
from the Route 1 Corridor

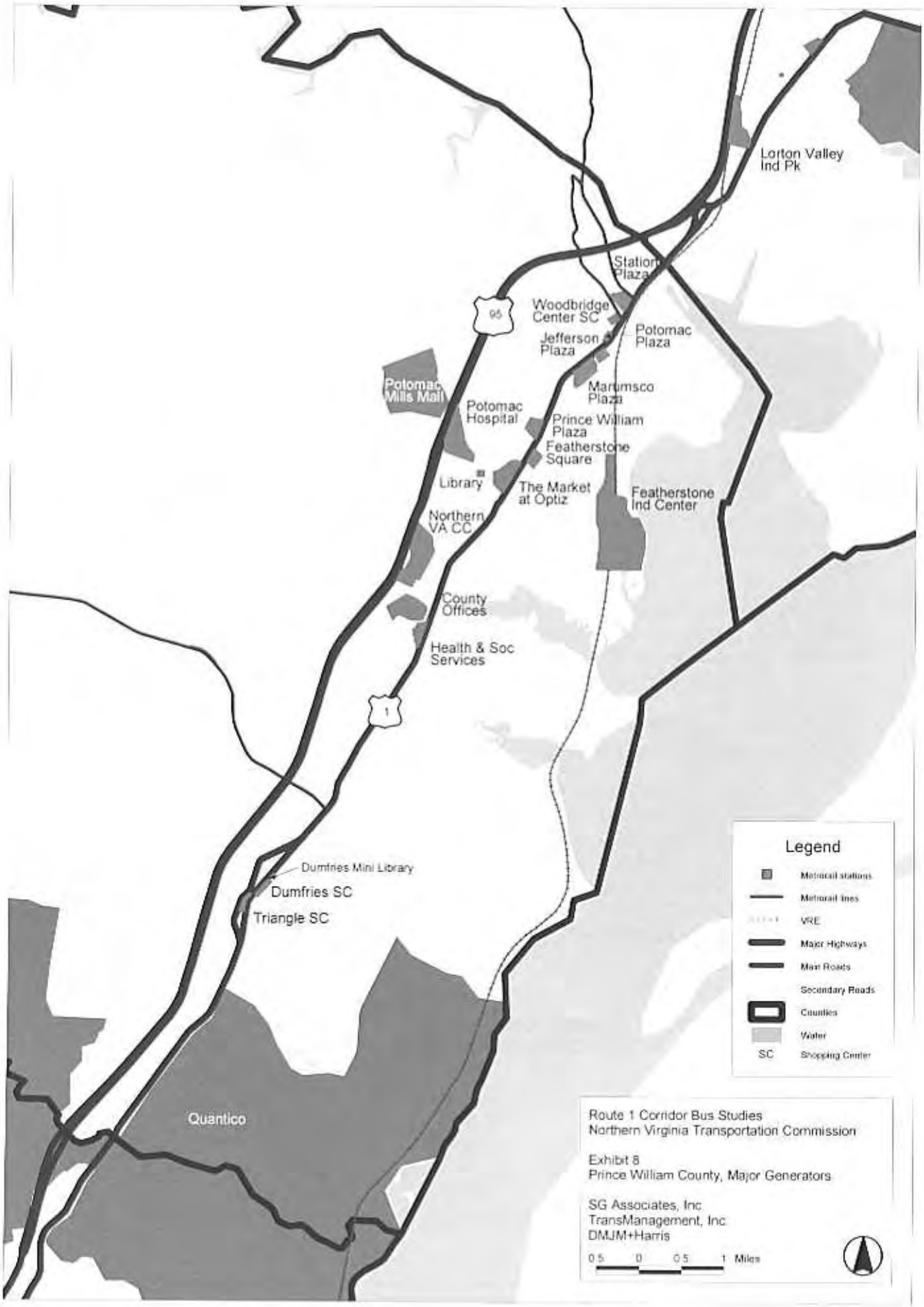
Attraction Area	Production Area			
	Fairfax County		Prince William County	
	2000	*2010*	*2000*	*2010*
Alexandria	1,744	2,119	149	269
Arlington County	7,124	8,393	629	1,024
DC Core	8,782	9,944	1,168	1,607
DC Non-core	860	1,265	118	224
Fairfax County				
– North of I-66	81	191	20	74
– South of I-66	221	282	57	144
– In corridor	190	203	16	30
Fredericksburg	0	0	4	14
Howard County	1	2	0	0
Montgomery County	137	179	29	45
Prince Georges County	171	313	30	95
Prince William County				
– In corridor	0	0	22	42
– Not in corridor	0	0	0	6
Total	19,311	22,891	2,242	3,574

The bulk of the growth in transit trip productions in the Fairfax County portion of the corridor is projected to occur in the areas immediately adjacent to Route 1, from the Capital Beltway south to Fort Belvoir. The MWCOG transit trip forecasts show that most transit trips produced in the corridor (over 90%) will be destined to locations that are reached either by direct bus service (e.g. Alexandria, Crystal City) or by a transfer to Metrorail (DC, other Arlington).

Table 5
Route 1 Corridor
MWCOG Home-Based Work Trip Forecasts
Trip Attractions and Mode Shares

Traffic Analysis Zone	HB Work Person Trip Attractions		HB Work Transit Trip Attractions		HB Work Percent Transit Attractions	
	Year 2000	Year 2010	Year 2000	Year 2010	Year 2000	Year 2010
Fairfax County						
1468	1,261	1,335	130	135	10.3%	10.1%
1469	1,553	1,814	149	175	9.6%	9.6%
1470	2,429	3,047	143	203	5.9%	6.7%
1471	1,988	2,602	87	134	4.4%	5.1%
1472	3,106	3,705	69	103	2.2%	2.8%
1473	636	784	30	40	4.7%	5.1%
1474	1,228	1,267	35	49	2.9%	3.9%
1475	246	291	3	3	1.2%	1.0%
1476	1,015	1,074	7	10	0.7%	0.9%
1480	1,914	1,997	135	179	7.1%	9.0%
1481	558	565	22	34	3.9%	6.0%
1482	151	195	7	6	4.6%	3.1%
1483	22	15	0	1	0.0%	6.7%
1484	334	393	4	2	1.2%	0.5%
1551	1,395	1,369	38	44	2.7%	3.2%
1552	1,842	1,829	51	53	2.8%	2.9%
1553	1,370	1,254	58	57	4.2%	4.5%
1554	2,193	2,614	29	46	1.3%	1.8%
1555	116	103	5	3	4.3%	2.9%
1556	180	163	2	1	1.1%	0.6%
1557	1,460	1,664	38	48	2.6%	2.9%
1558	700	609	26	25	3.7%	4.1%
1559	68	187	0	0	0.0%	0.0%
1560	10,729	11,387	255	345	2.4%	3.0%
1561	3,297	4,163	29	76	0.9%	1.8%
1562	3,823	3,584	75	83	2.0%	2.3%
1563	0	1,285	0	141	–	11.0%
1564	10,987	12,064	94	8	0.9%	0.1%
1569	2,250	2,846	5	0	0.2%	0.0%
1635	431	368	0	1	0.0%	0.3%
1636	570	617	0	0	0.0%	0.0%
1637	104	1,712	2	61	1.9%	3.6%
1638	2,273	3,030	18	51	0.8%	1.7%
1639	696	801	0	0	0.0%	0.0%
1640	157	166	0	0	0.0%	0.0%
1641	163	659	0	0	0.0%	0.0%
Subtotal	61,245	71,558	1,546	2,117	2.5%	3.0%
Prince William County						
1920	5,025	5,337	155	239	3.1%	4.5%
1921	2,497	2,560	24	35	1.0%	1.4%
1922	2,525	3,722	4	19	0.2%	0.5%
1923	2,596	2,683	58	75	2.2%	2.8%
1924	3,245	3,140	10	22	0.3%	0.7%
1925	777	2,185	7	32	0.9%	1.5%
1980	319	401	0	1	0.0%	0.2%
1981	2,497	2,631	1	5	0.0%	0.2%
1982	9,652	9,444	0	0	0.0%	0.0%
1983	2,847	3,013	2	9	0.1%	0.3%
1984	487	1,780	7	26	1.4%	1.5%
1985	166	220	0	1	0.0%	0.5%
1986	973	1,772	16	56	1.6%	3.2%
1987	0	975	0	1	–	0.1%
Subtotal	33,606	39,863	284	521	0.8%	1.3%
Total	189,702	222,842	1,830	2,638	1.0%	1.2%


395
495
95
Huntington Metro
Builder's Square
Beacon Mall
Franconia-Springfield Metro
Mt Vernon Plaza
Hybla Valley Plaza
Sherwood Reg'l Library
Mt Vernon SC
Future Gov't Site
Mt Vernon Hospital
Englesida Plaza
Telegraph Sq Ind Pk
Woodlawn Shop Ctr
Sacramento Shop Ctr
Pear Tree Village SC
County Center
Lockport Ind Pk
Pohick Ind Pk
Gunston Plaza
Fort Belvoir
Lorton Library
Lorton Valley Ind Pk
Old Mt Vernon Hwy
Mt Vernon Hwy
Legend
Metrorail stations
Metrorail lines
VRE
Major Highways
Main Roads
Secondary Roads
Counties
Water
SC Shopping Center
Route 1 Corridor Bus Studies
Northern Virginia Transportation Commission
Exhibit 7
Fairfax County, Major Generators
SG Associates, Inc.
TransManagement, Inc.
DMJM+Harris
0.5 0 0.5 1 Miles


Lorton Valley
Ind Pk
Station
Plaza
Woodbridge
Center SC
95
Jefferson
Plaza
Potomac
Plaza
Potomac
Mills Mall
Marumsco
Plaza
Potomac
Hospital
Prince William
Plaza
Featherstone
Square
Library
The Market
at Optiz
Featherstone
Ind Center
Northern
VA CC
County
Offices
Health & Soc
Services
1
Dumfries Mini Library
Dumfries SC
Triangle SC
Quantico
Legend
Metrorail stations
Metrorail lines
VRE
Major Highways
Main Roads
Secondary Roads
Counties
Water
SC
Shopping Center
Route 1 Corridor Bus Studies
Northern Virginia Transportation Commission
Exhibit 8
Prince William County, Major Generators
SG Associates, Inc
TransManagement, Inc
DMJM+Harris
0.5
0
0.5
1
Miles

The projections are a result, in part, of the transit network assumed in the MWCOG projections – essentially the same services as exist in 2000. Were there to be substantial changes or additions to the regional network, such as express bus service on the Capital Beltway or a light rail connection from Springfield to Tysons Corner, the pattern of transit use would no doubt change, reflecting these new opportunities. Should any of these projects proceed to implementation, it will be necessary to reassess the level of bus service required to serve the projected demand for access to the Huntington Metrorail station and the Springfield Transit Center.

TRANSIT SERVICES

Three operators of service currently provide bus service along the Route 1 Corridor.

They are Metrobus operated by the Washington Metropolitan Area Transit Authority (WMATA), the Fairfax Connector and the OmniRide/OmniLink services of the Potomac and Rappahannock Transportation Commission (PRTC). WMATA's bus routes serving the corridor (9A and 11Y) are radially oriented. The 9A is the primary trunk route operating on US 1. The Fairfax Connector routes operate in the Fairfax County portion of the corridor providing local circulation and connections to Metrorail. Fairfax Connector operations are provided by a private firm under contract to Fairfax County. Exhibit 9 illustrates bus services operated in Fairfax County.

PRTC's OmniRide bus routes offer express service on the I-95 HOV lanes from portions of the corridor in Prince William County to the Pentagon and the District of Columbia. OmniRide also provides service between Prince William County and the Springfield/Franconia Metrorail station. OmniLink provides local service in the portions of the Route 1 Corridor in Prince William County using a fixed-schedule, point-deviation service strategy. At present, WMATA is the contract operator for PRTC's OmniRide and OmniLink. Exhibit 10 illustrates bus services operated in Prince William County.

In addition to the three bus services, the Virginia Railway Express (VRE) operates commuter rail service that parallels Route 1. The Fredericksburg Line, with current stations at Quantico, Rippon, Woodbridge and Lorton and a planned station at Cherry Hill, provides 6 trains per day in each direction. Amtrak operates five northbound and six southbound trains. The VRE trains stop at all of the stations; all the Amtrak trains stop at Quantico. Two morning Amtrak trains (7:50 AM and 9:49 AM) and three afternoon Amtrak trains (2:59 PM, 3:30 PM and 8:24 PM) also stop at Woodbridge.

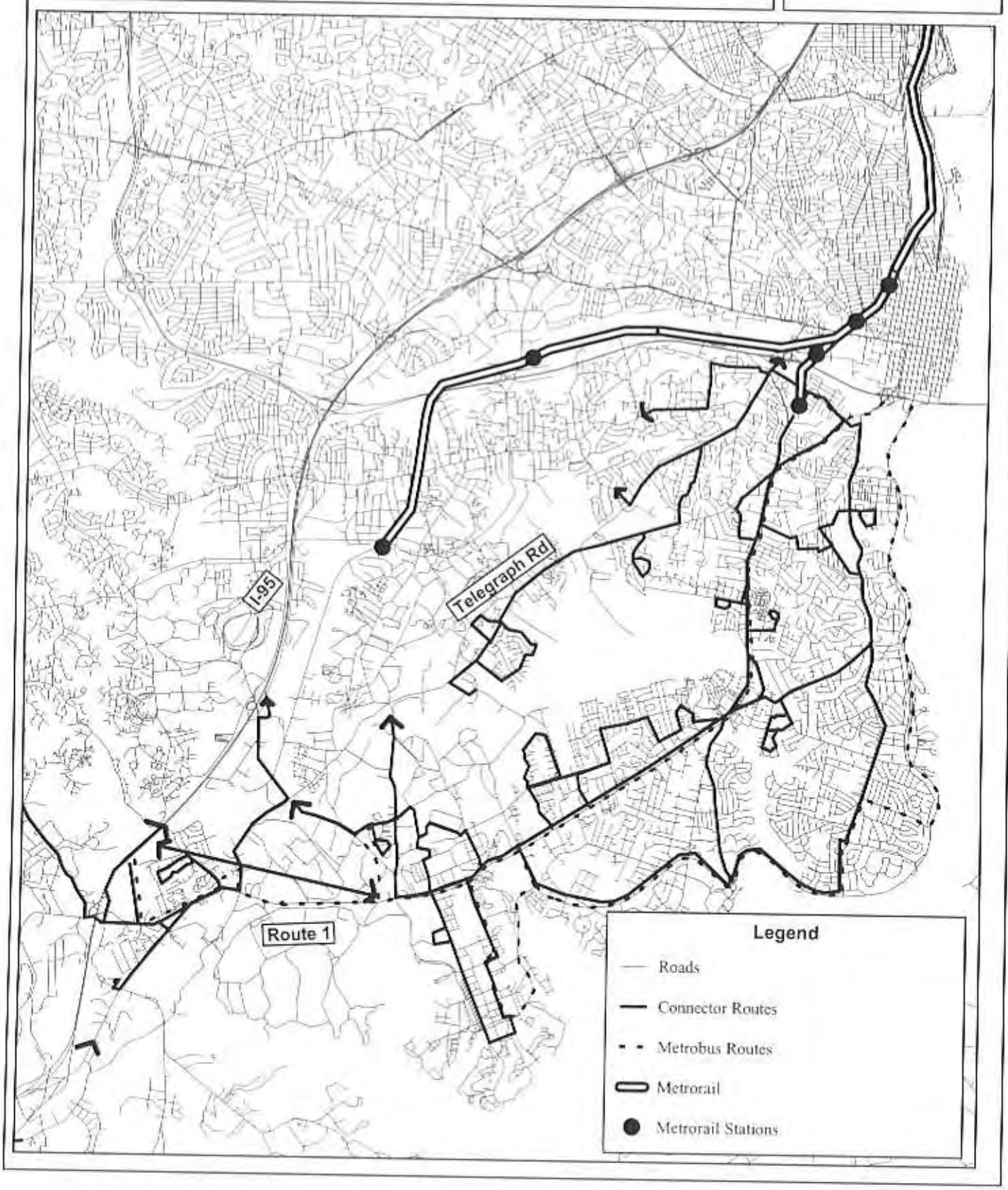
Metrobus

WMATA, Metrobus, currently operates 2 bus routes in the Route 1 Corridor. Table 6 summarizes Metrobus services operating along the Route 1 corridor.

Exhibit 9

Bus Routes Operating in Route 1 Corridor

(Fairfax County)



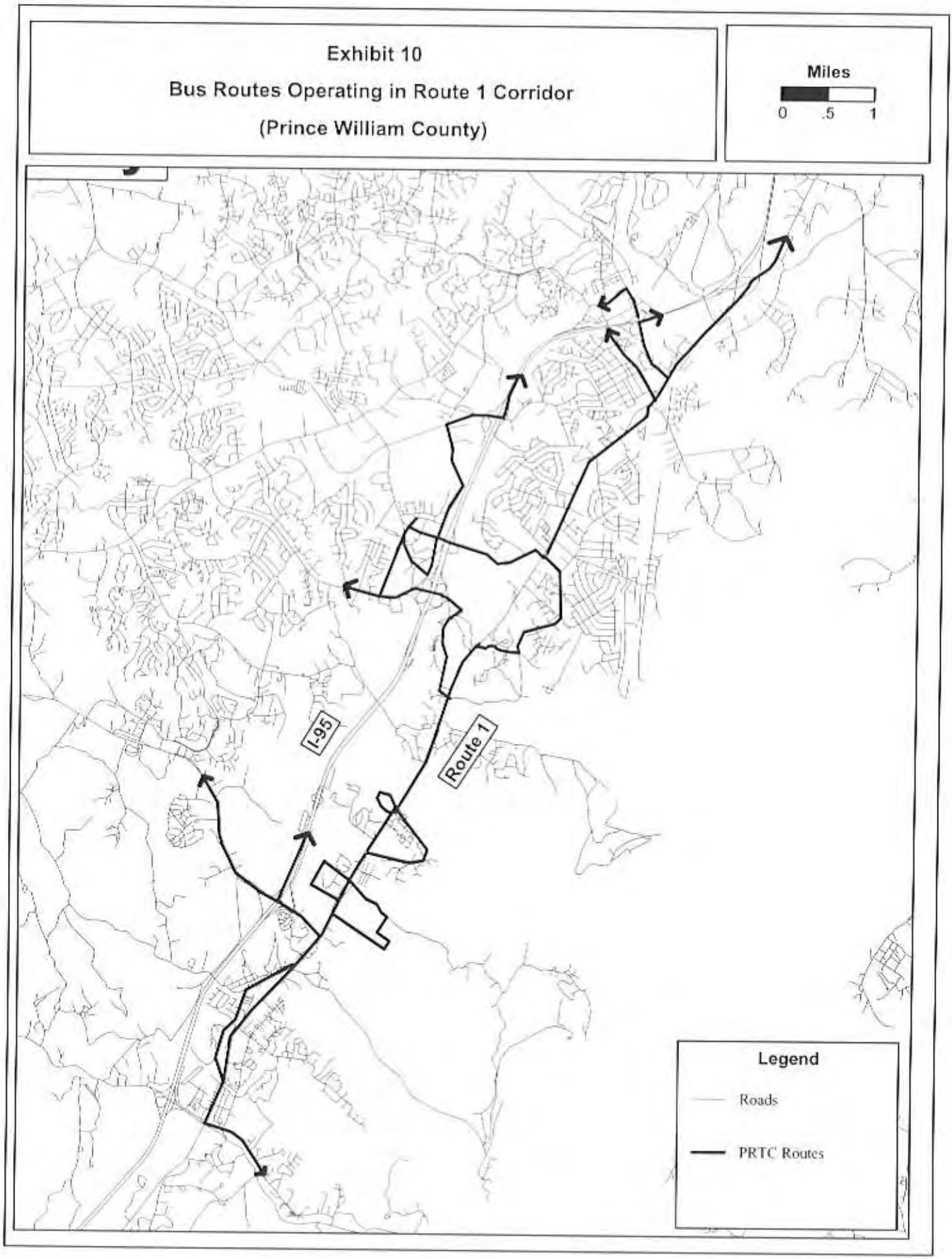


Exhibit 10
Bus Routes Operating in Route 1 Corridor
(Prince William County)
Miles
0 .5 1
I-95
Route 1
Legend
Roads
PRTC Routes

Table 6
Metrobus Services

Line	Route	Key Corridor Locations Served	Daily Weekday Trips	Daily Saturday Trips	Daily Sunday Trips
Richmond Highway	9A*	Belvoir, Beacon Mall, Huntington Metro	81	79	41
Mt.Vernon Express	11Y	Fort Belvoir	6	—	—

* Denotes Routes which operate along portions of Route 1 in Fairfax County

Fairfax Connector

The Fairfax Connector currently operates 15 bus routes along the study corridor between approximately 5:00 AM and 12:00 AM. Below, Table 7 summarizes all Fairfax Connector services serving the Route 1 corridor.

Table 7
Fairfax Connector Services

Line	Route	Key Corridor Locations Served	Daily Weekday Trips	Daily Saturday Trips	Daily Sunday Trips
Fort Hunt	101, 102*	Huntington Metro, Belle View Shopping Center, River Towers, Beacon Mall	40, 12	26,__	20,__
Belle View	103*	Huntington Metro, Belle View Shopping Center, River Towers, Beacon Mall	21	17	—
Richmond Highway	105*, 106*, 107*	Huntington Metro, Beacon Mall, Mt.Vernon Apts, Nursing Home, Mt.Vernon Hospital, IMP, DLA, Belvoir	75, 25, 26	26,__,__	27,__,__
Telegraph Road	108	Huntington Metro	30	—	—
Old Keen Mill - Franconia Rds.	109, 110	Huntington Metro	58, 40	36, 28	__, 20
Beulah St.	202*	DLA, Belvoir	39	—	—
Lorton	303*, 383*	Lorton VRE	26, 8	—	—
Saratoga	304	DLA, Gateway 95	12	—	—
Newington Forest	305, 385	Silverbrook Rd.	5, 8	—	—

* Denotes Routes which operate along portions of Route 1 in Fairfax County

It is important to note that certain Fairfax County Connector routes, while not operating on Route 1, provide service to the major employment area at Fort Belvoir. Connector routes 202 and 304 provide service between the J. Alexander Transit Center in Springfield, served by VRE and Metrorail, and the Defense Logistics Agency facility at Fort Belvoir, with trips available about every twenty minutes in the morning and afternoon peak periods. For Fort Belvoir and the lower Fairfax County portion of the corridor, Springfield rather than Huntington may be the preferred connection to regional services.

OmniRide/OmniLink

The Potomac and Rappahannock Transportation Commission (PRTC) operates 12 OmniRide (commuter) routes between 5:00 AM and 9:00 PM and 3 OmniLink (local) routes between 5:45 AM and 10:45 PM along the Route 1 Corridor. Table 8 summarizes all PRTC services operating along the Route 1 study corridor and locations served in or near the corridor.

Table 8
PRTC Services (as of July 2000)

Route	Service Type	Key Corridor Locations Served	Weekday Daily Trips
Dale City to Pentagon/Crystal City	OmniRide	OmniRide Transit Center, Potomac Mills, Horner Rd. Lot	16
Dale City to DC	OmniRide	OmniRide Transit Center, Potomac Mills, Horner Rd. Lot	23
Lake Ridge to Pentagon/Crystal City	OmniRide	Old Bridge/123Lot, 123/I-95 Lot	10
Lake Ridge to DC	OmniRide	Old Bridge/123Lot, 123/I-95 Lot	24
Dale City/Lake Ridge to Capitol Hill	OmniRide	Old Bridge/123Lot	2
Dale City/Lake Ridge to Springfield	OmniRide	Old Bridge/123Lot, 123/I-95 Lot, OmniRide Transit Center, Potomac Mills, Horner Rd. Lot	1
Washington/Pentagon to DC/LR	OmniRide		4
State Department to LR/DC	OmniRide		2
Prince William Direct*	OmniRide	Potomac Mills, OmniRide Transit Center, Navy Housing, Woodbridge VRE	24
Montclair	OmniRide	Exeter Lot, 234/Rt.1 Lot	10
Route 1*	OmniRide	Triangle Shopping Center, Dumfries Lot, Featherstone Square, Marumsco Plaza, 123/I-95 Lot	2
South Route 1*	OmniRide	234/Rt.1 Lot	8
Dale City	OmniLink	Potomac Mills	38
Dumfries*	OmniLink	Quantico, Triangle Plaza, Ferlazzo Bldg, Potomac Mills	38
Woodbridge/Lake Ridge*	OmniLink	Potomac Mills, Market at Opitz Plaza, Marumsco Plaza	42

* Denotes Routes which operate along portions of Route 1

Table 9 documents the days of service and the service span for the various bus routes operating in the corridor.

Table 9
Service Days and Span

		Span of Service		
	Route	*Weekday*	*Saturday*	*Sunday*
Metrobus	9A	4:10 AM to 3:27 AM	4:59 AM to 3:23 AM	5:02 AM to 1:49 AM
	11Y	Morning and Evening Peak Hours Only	No Service	No Service
Fairfax Connector	101/102	5:17 AM to 9:51 PM	7:02 AM to 8:05 PM	8:57 AM to 6:51 PM
	103	5:47 AM to 9:28 PM	8:00 AM to 8:31 PM	No Service
	105/106/107	5:00 AM to 11:54 PM	6:57 AM to 7:54 PM	7:23 AM to 9:03 PM
	108	5:44 AM to 7:47 PM	No Service	No Service
	109/110	5:20 AM to 11:26 PM	7:00 AM to 10:44 PM	9:10 AM to 7:05 PM
	202	5:15 AM to 9:39 PM	No Service	No Service
	303/383	Morning and Evening Peak Hours Only	No Service	No Service
	304	Morning and Evening Peak Hours Only	No Service	No Service
OmniRide	Route to Pentagon/ Crystal City/ Downtown DC	Morning and Evening Peak Hours Only	No Service	No Service
	Metro Direct	5:25 AM to 7:55 PM	No Service	No Service
OmniLink	Woodbridge/ Lake Ridge/	5:45 AM to 10:40 PM	No Service	No Service
	Dumfries	5:47 AM to 10:37 AM	No Service	No Service

BUS VOLUMES ALONG ROUTE 1

With the exception of a short segment between Gunston Road and the Occoquan River, there is bus service at some time of day on all portions of Route 1 in the corridor. The times at which bus service is available and the number of trips offered varies considerably with low to moderate service levels generally south of Fort Belvoir and higher service levels in the more densely developed areas north of Fort Belvoir.

Exhibits 11 and 12 illustrate the number of scheduled bus trips, all routes combined, operating northbound on the various portions of Route 1 between 7:00 AM and 8:00 AM on a weekday. Assuming that the level of service increases in proportion to the demand, the number of bus trips can be expected to increase, by 2020, by 20% in Fairfax County and by up to 60% in Prince William County. For most of the corridor, the bus volumes will be low enough, even with the projected service increases, that there would be little conflict between bus operations and highway traffic. North of Mount Vernon Highway (Ladson Lane), however, the number of buses in the peak hour, peak direction will range from 10 to 12 – or a bus about every five minutes. This is a very high quality of service to passengers, but could lead to conflicts between auto traffic and buses stopped to pick-up or discharge passengers. Auto drivers, other than those making right-turns, will tend to avoid the lane in which buses are operating – the right-most or curb lane – making this a de facto bus and right-turn lane.

PASSENGER VOLUMES

Metrobus

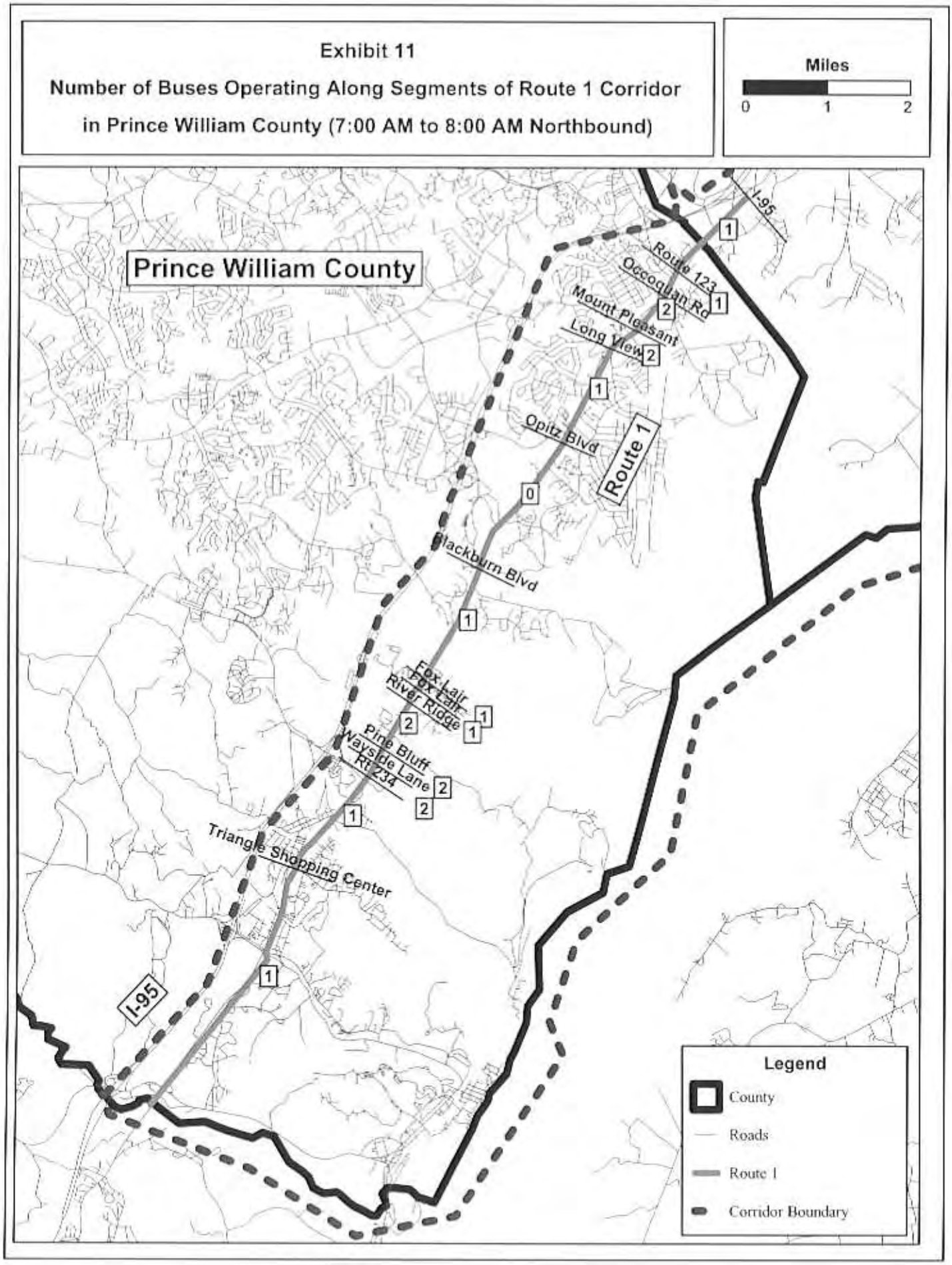
Daily boardings by stop data, were collected by WMATA in 1996. Boardings for 2000 were estimated based on recorded changes in route ridership. The 11Y currently is estimated to have 84 northbound boardings and 72 southbound alightings at stops located in the corridor. This represents an increase of 20 boardings per day in each direction since the counts due to fare restructuring. Northbound, the 9A had in the corridor 1,493 boardings and 765 alightings. Southbound, there were 867 boardings and 1,656 alightings at stops located in the study corridor.

Fairfax Connector

Estimates of bus stop level activity for Fairfax Connector were developed using sample ridership data by stop, collected by the Northern Virginia Transportation Commission in 1999 for the National Transit Database reports, and the average daily boardings by route for 2000. The percentage of sample ridership by stop compared to the overall sample route ridership was multiplied by the total daily 2000 route boardings in order to estimate current daily boardings by stop. The Connector provides daily service to 8,496 riders on the 15 routes that serve some portion of the Route 1 corridor. In the Corridor, estimated Connector boardings are 2,768 northbound and 2,886 southbound. About 40% of the Connector riders in the corridor board at stops on Route 1.

Exhibit 11

Number of Buses Operating Along Segments of Route 1 Corridor in Prince William County (7:00 AM to 8:00 AM Northbound)



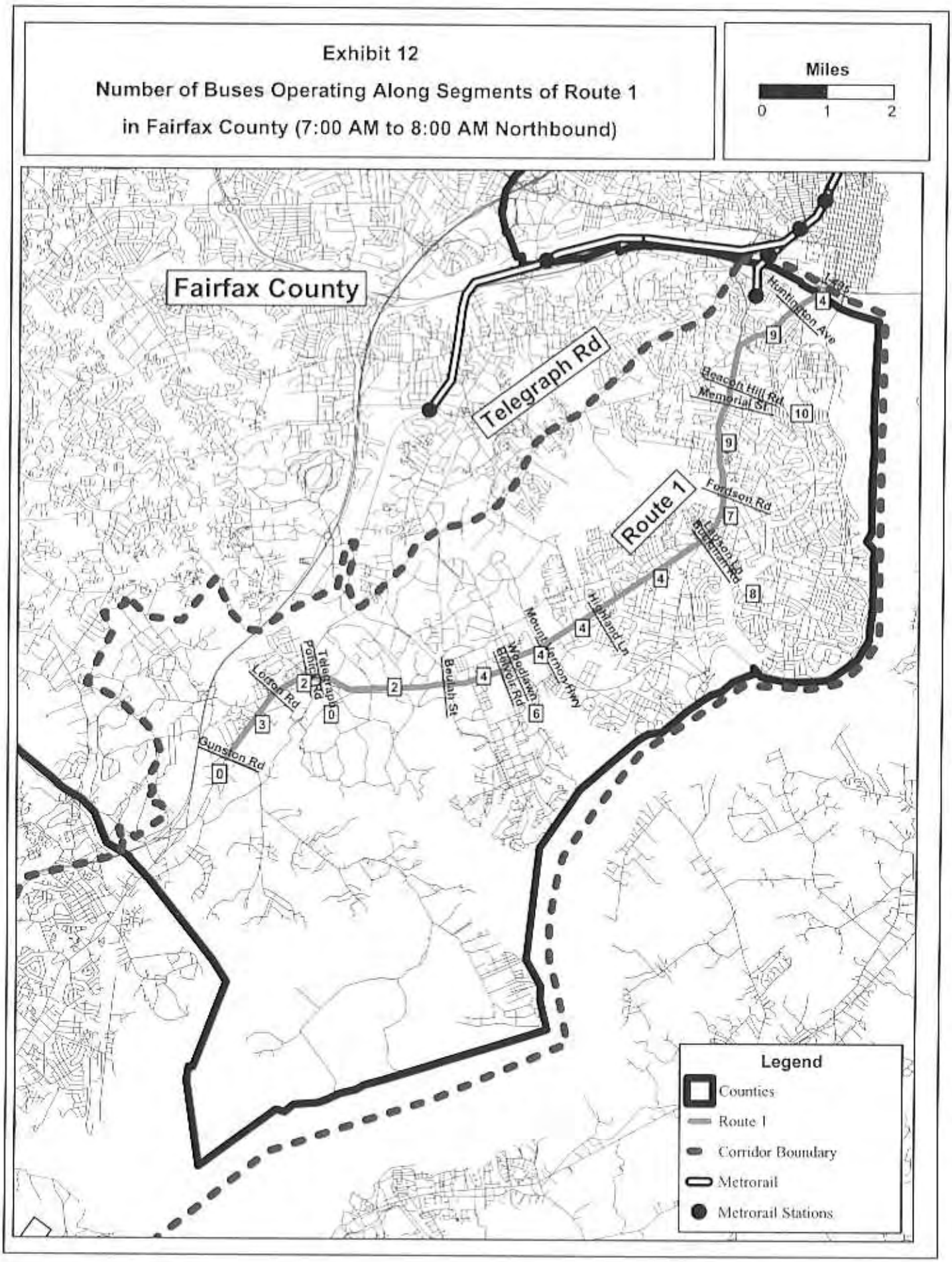


Exhibit 12
Number of Buses Operating Along Segments of Route 1
in Fairfax County (7:00 AM to 8:00 AM Northbound)
Miles
0
1
2
Fairfax County
Telegraph Rd
Route 1
Huntington Ave
Beacon Hill Rd
Memorial St
Ferdson Rd
Lawton Rd
Highland Ln
Mount Vernon Hwy
Woodlawn
Elmhoir Rd
Beulah St
Telegraph
Pointe Rd
Lorton Rd
Gunston Rd
Legend
Counties
Route 1
Corridor Boundary
Metrorail
Metrorail Stations

OmniRide/OmniLink

PRTC's OmniRide routes serving at least a portion of the Route 1 corridor are estimated to have carried about 2,300 commuters during June 2000. Northbound service was provided to about 1,000 passengers, while southbound service was provided to about 1300 riders. It is estimated that persons traveling to or from a location in the Route 1 corridor accounted for 465 northbound riders and 481southbound riders.

Using daily ridership data by stop, collected for the Comprehensive Operations Analysis in 1996, and the average daily boardings by route for June 2000, current data by stop were estimated using the percent difference from 1996 total daily route ridership to 2000 total daily route ridership. Appendix C displays all OmniRide stops located in the study area for each route and the 2000 estimated stop activity.

PRTC's OmniLink, excluding the Manassas Routes, carried a daily average of 1,320 riders in July 2000. Table 10, below, displays ridership by route.

Table 10
Average Daily OmniLink Ridership in July, 2000

Route	Ridership
Dale City	352
Lake Ridge/Woodbridge	405
Dumfries	563
Total	**1,320**

SERVICE GAPS

While bus service in some form is available on most portions of Route 1 from Quantico to Alexandria, at least during weekday peak hours, there are both geographic and temporal service gaps.

Geographic Gaps

In Prince William County, the route-deviation service pattern used for the local OmniLink buses provides coverage to all locations along Route 1, even though the primary route may be off Route 1. OmniRide commuter services do not operate on Route 1 between Neabsco Mills Road and Longview Drive. In Fairfax County, there is no bus service provided in the area from the Occoquan River to Gunston Road.

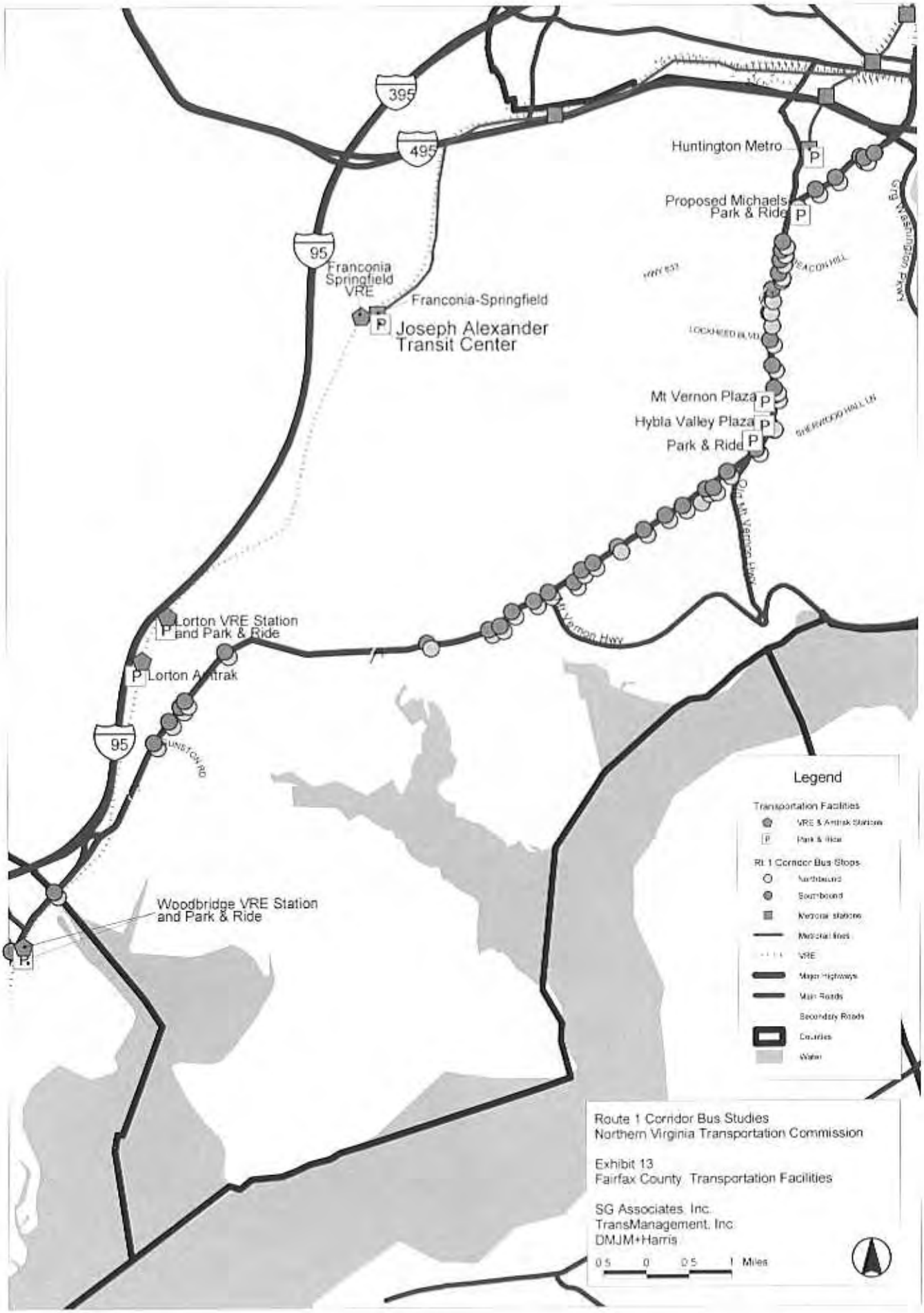
Temporal Gaps

In Prince William County, the local OmniLink service is operated weekdays from roughly 6:00 AM to 10:30 PM. No service is provided on Saturdays or Sundays. In Fairfax County, service north of Fort Belvoir, via the WMATA Route 9A, is available essentially 24 hours on weekdays and from 5:00 AM to 1:00 AM on Saturdays and Sundays. The portion of Route 1 between Fort Belvoir and Lorton has no service after 11:30 PM on weekdays, and no service on Saturdays or Sundays. Saturday evening service is not provided on Fairfax Connector Route 105 serving an area west of Route 1, south of Ladson Lane. Fairfax Connector service between Lorton and Springfield is available only during weekday peak hours.

BUS STOPS

Bus stops are the initial point of contact between the prospective bus passenger and the bus service. A bus stop should be more than a sign by the side of the road. A bus stop should provide a comfortable hard-surface boarding, alighting and waiting area, accessible to riders at a location where the bus can safely stop to pick-up or discharge riders. Where boarding activity is high, 25 boardings or more per day, benches or shelters should be provided for waiting passengers.

Exhibits 13 and 14 illustrate the locations of marked bus stops on Route 1 in Fairfax and Prince William Counties. Tables 11 and 12 summarize the conditions at existing bus stops along Route 1.


395
495
95
Huntington Metro
Proposed Michaels Park & Ride
Franconia Springfield VRE
Franconia-Springfield
Joseph Alexander Transit Center
Mt Vernon Plaza
Hybla Valley Plaza
Park & Ride
Lorton VRE Station and Park & Ride
Lorton Amtrak
Woodbridge VRE Station and Park & Ride
Legend
Transportation Facilities
VRE & Amtrak Stations
Park & Ride
Rt 1 Corridor Bus Stops
Northbound
Southbound
Metrorail stations
Metrorail lines
VRE
Major Highways
Main Roads
Secondary Roads
Counties
Water
Route 1 Corridor Bus Studies
Northern Virginia Transportation Commission
Exhibit 13
Fairfax County Transportation Facilities
SG Associates, Inc.
TransManagement, Inc.
DMJM+Harris
0.5 0 0.5 1 Miles

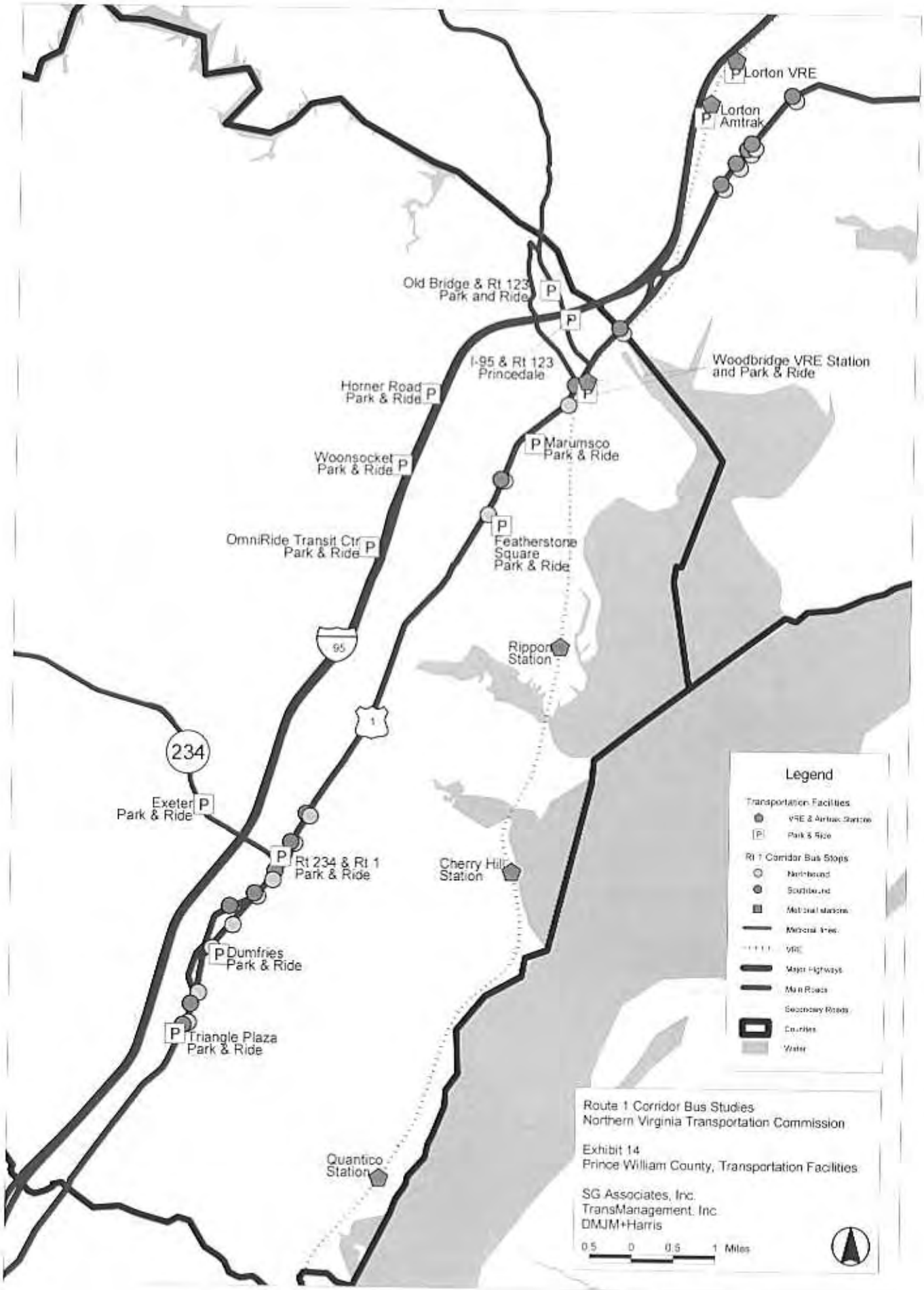

Lorton VRE
Lorton Amtrak
Old Bridge & Rt 123 Park and Ride
I-95 & Rt 123 Princedale
Woodbridge VRE Station and Park & Ride
Horner Road Park & Ride
Marumsco Park & Ride
Woonsocket Park & Ride
OmniRide Transit Ctr Park & Ride
Featherstone Square Park & Ride
95
Rippon Station
1
234
Exeter Park & Ride
Rt 234 & Rt 1 Park & Ride
Cherry Hill Station
Dumfries Park & Ride
Triangle Plaza Park & Ride
Quantico Station
Legend
Transportation Facilities
VRE & Amtrak Stations
Park & Ride
Rt 1 Corridor Bus Stops
Northbound
Southbound
Major Highways
Main Roads
Secondary Roads
Counties
Water
Route 1 Corridor Bus Studies
Northern Virginia Transportation Commission
Exhibit 14
Prince William County, Transportation Facilities
SG Associates, Inc.
TransManagement, Inc.
DMJM+Harris
0.5 0 0.5 1 Miles

Table 11
Northbound Bus Stops Along Route 1

	Stop	Sign	Operator	Shelter	Bench	Trash can	Cross Walk	Approaches sidewalk	Curb Cut	Bus Turnout	Paved	Shelter Conditions/ Comments
Prince William County												
1	X Anderson Rd	X	OL, OR					X	X			
2	Bradby's Hill	X	OL									
3	Dumfries Shopping Pl	X	OR									
4	Williamstown	X	OL									
5	Possum Point	X	OL									
6	Dumfries Rd	X	OL									
7	Wayside Dr	X	OL									Truck Pulloff
8	Cherry Hill Rd	X	OL, OR					X	X			
9	Featherstone	X	OR				X	X	X			
10	Village Dr	X	OL					X	X			
11	Before Dawson Beach near McDonalds	X	OL					X	X			
Fairfax County												
12	Dutchman	X	FC				X	X	X			
13	Woodside Ln	X	FC					X	X			
14	Backlick Rd	X	M									
15	Woodlawn	X	M				X	X	X			
16	After Mt. Vernon Memorial Hwy	X	M, FC					X	X			
17	Woodlawn Garden	X	M, FC									
18	Copper Rd	X	M, FC	X			X				X	Average
19	Woodlawn Ct	X	M, FC									
20	Lukens Ln	X	M, FC	X	X		X				X	Average
21	X Highland Ave	X	FC				X no sig					
22	Washington Square	X	M, FC	X	X	X			X	X		Average
23	Frye Rd	X	M, FC	X	X	X	X			X	X	Average
24	X Graves	X	M, FC	X								Poor - broken glass
25	Buckman	X	M, FC	X		X		X	X		X	Average
26	Mohawk Ln	X	M, FC					X	X			
27	Reddick	X	M, FC				X					
28	X Martha	X	M, FC									
29	Shannons Green Way	X	M, FC					X	X			
30	Janna Lee Ave	X	M, FC									
31	Mount Vernon	X	M, FC									
32	Ladson Ln	X	M, FC				X	X	X			
33	Sherwood Hall Ln	X	M, FC				X	X	X	X		
34	Belford	X	FC				X	X	X			
35	Kings Village Rd	X	M, FC	X	X	X		X	X	X	X	Average
36	Fordson Rd	X	M, FC				X			X	X	
37	Woodlawn Tr	X	M, FC	X	X	X			X		X	Average
38	Arlington Dr	X	M, FC	X	X	X	X	X	X	X	X	Average
39	Lockheed Blvd	X	M, FC			X	X				X	
40	X Holly Hill	X	M, FC									
41	Collard St	X	M, FC				X	X	X	X		
42	East Side Dr	X	M, FC					X	X			
43	Beacon Hill Rd	X	M, FC	X	X	X	X	X	X		X	Average
44	Bedoo St	X	M, FC	X	X	X		X	X		X	Average
45	Dawn Dr	X	M, FC					X	X			
46	Reagan	X	M, FC					X	X			
47	S Kings Hwy	X	M, FC	X	X	X	X	X	X	X	X	Average
48	Quander Rd	X	M, FC				X			X	X	
49	X Belle Haven	X	M, FC							X	X	
50	X Montibello	X	M							X	X	

* Includes stops actually on Rt.1(excludes stops inside shopping centers)
**Crosswalks within 250 feet of stop

Table 12
Southbound Bus Stops Along Route 1

		Sign	Operator	Shelter	Bench	Trash can	Cross-Walk	Approaches sidewalk	Curb Cut	Bus Turnout	Paved	Shelter Conditions/ Comments
Fairfax County												
1	Huntington Gateway X	X	M, FC		X	X						
2	Belle Haven Towers	X	M, FC			X		X	X	X		
3	X Quander Rd	X	M, FC					X		X		
4	N Kings Hwy	X	M, FC		X		X			X		
5	S Kings Hwy	X	M, FC	X	X	X	X	X	X		X	
6	Franklin St	X	M, FC					X	X		X	Average
7	X Dawn	X	M					X	X			
8	X Dawn	X	FC							X		
9	Beacon Hill Rd	X	M, FC	X	X	X	X		X			
10	X Schooley	X	M, FC	X	X	X			X		X	Average
11	Collard St	X	M, FC				X	X			X	Average
12	Fordson St	X	M, FC		X	X				X		
13	Lockheed Blvd	X	M, FC	X	X	X	X		X		X	Turnout on Access
14	Arlington Dr	X	M, FC				X			X		Average
15	Woodlawn Rd	X	M, FC	X	X	X		X	X			
16	Fordson Rd	X	M, FC	X	X	X	X		X		X	Average
17	Belford	X	FC				X		X			
18	Belford	X	M				X					
19	Sherwood Hall Ln	X	M, FC				X	X	X			
20	Ladson Ln	X	M, FC	X	X	X	X	X	X		X	Poor - broken glass
21	Buckman Rd	X	M, FC						X			
22	Janna Lee Ave	X	M, FC	X	X	X			X			Average
23	Central Ave	X	M, FC					X	X			
24	Martha St	X	M, FC									
25	Gregory Dr	X	M, FC					X	X			
26	Buckman Rd	X	M, FC									
27	Brevard Ct	X	M, FC									
28	Graves St	X	M									
29	Frye Rd	X	M, FC		X		X					
30	X Skyview Dr	X	M, FC									
31	Highland Ave	X	M, FC				X no sig	X	X		X	
32	Lukens Ln	X	M, FC		X	X	X					
33	Sacramento Dr	X	M, FC				X				X	
34	X Woodlawn Garden	X	M								X	
35	County Building	X	FC									
36	Roy Rogers	X	M, FC					X	X			
37	Belvoir Rd	X	M					X	X			
38	Belvoir Rd	X	FC	X	X			X		X		
39	Fort Belvoir	X	FC					X		X	X	Average
40	Burger King	X	M, FC									
41	Anderson	X	M					X	X			
42	Armistead	X	FC									
43	Cherwick	X	FC									
44	Lorton Library	X	FC									
Prince William County												
45	Dawson Beach Rd	X	OL				X	X	X			
46	Belair	X	OL			X						
47	Allen Dent	X	OL					X	X			
48	Wayside Dr	X	OL					X	X			
49	Dumfries Rd	X	OL					X	X			
50	Liberty Village X Possum	X	OL					X	X			
51	Washington St	X	OL					X	X			
52	After C St Quantico	X	OL					X	X			
53	Anderson Rd	X	OL									

*Includes stops actually on Rt.1(excludes stops inside shopping centers) **Crosswalks within 250 feet of stop

Bus Stop Activity

Bus stop activity (boardings) for northbound bus stops in the Fairfax County portion of the corridor, as estimated from available data, is summarized in Table 13. Northbound stops along Route 1 in Fairfax County serve about 2,300 boardings each weekday. Twenty of these could be considered "heavy use stops" with fifty or more boardings. In the area between Ladson Lane and Lockheed Boulevard, every stop can be considered a "heavy use" stop.

In Prince William County, the number of bus stops directly on Route 1 has been limited. Traffic operating speeds and the roadway section make it difficult to locate bus stopping areas on Route 1. The demand-responsive nature of the OmniLink local service has reduced the need for such stops. There are only 12 bus stop locations directly on Route 1. In many cases, bus stops are located in shopping areas or similar locations off of Route 1. Table 14 summarizes existing bus stop activity in Prince William County.

ROADWAYS

The roadway system in the study corridor includes Route 1 (Jefferson Davis Highway), the focus of this study, and other roadways that serve north-south oriented travel. These include Interstate 95 which generally parallels Route 1 from Quantico to Alexandria and, in Fairfax County, the George Washington Memorial Parkway, Ft. Hunt Road and Telegraph Road. East-west connecting roadways are relatively few. These include Route 619, Route 234, Opitz Boulevard and Route 123 in Prince William County and Lorton Road, Pohick Road, Backlick Road and Buelah Road.

Route 1 serves not only as the primary access to residential areas, businesses and other uses abutting the roadway, but also as the primary roadway for local travel within the corridor. It is the primary alternative route when there is congestion on I-95.

From the Capital Beltway south to Route 235 (Mount Vernon Highway), the roadway has six travel lanes (3 in each direction with a median). South of Route 235, the roadway is generally four lanes with no median. The pavement width varies and frontage roads have been developed in some sections. Sidewalks are available in many locations north of Fort Belvoir, but are generally absent south of Woodlawn Road.

A major reconstruction is being planned for Route 1. The proposed roadway would be at least six lanes throughout the entire section from Quantico to the Capital Beltway. An eight-lane facility is being studied for the portion of Route 1 in Fairfax County north of the northern intersection with Route 235 (Mt. Vernon Highway/Buckman Road). The November 1997 Route 1 Corridor Study report recommended HOV designation for the outer lanes of the northern section, subject to more detailed analysis. This will be evaluated during the final design phase of the Route 1 reconstruction.

A median will be provided with turn lanes at intersections. There will be extensive streetscaping with a trail or sidewalk available on each side of Route 1 wherever there is adjacent development. Seven existing intersections are proposed to be replaced by grade-separated interchanges. Consolidation and reduction of driveway access points is anticipated.

If the roadway is developed as currently planned, Route 1 in the future will look much different than it does today. Many of the physical features that affect bus operations and passenger access will be changed.

Table 13

Estimated Year 2000 Weekday Boardings at Bus Stops on Route 1
Northbound in Fairfax County

AT STREET	9A	102	103	105	106	107	303	Total
Armistead Blvd.	-	-	-	-	-	-	0	0
Cherwek Dr.	-	-	-	-	-	-	0	0
Cherwick Dr.	-	-	-	-	-	-	0	0
Hagel Circle	-	-	-	-	-	-	16	16
Dutchman Dr.	-	-	-	-	-	-	0	0
Woodside La.	-	-	-	-	-	-	8	8
Constitution Rd. (opposite)	-	-	-	-	-	15	-	15
WOODLAWN RD X	14	-	-	-	-	0	-	14
OLD MILL RD X	60	-	-	17	-	0	-	77
#8801	0	-	-	12	-	-	-	12
Sacramento Dr.(opposite)	-	-	-	41	-	61	-	102
COOPER RD	85	-	-	-	-	15	-	100
WOODLAWN CT X	3	-	-	-	-	0	-	3
LUKENS LA	53	-	-	-	-	15	-	68
HIGHLAND LA X	14	-	-	-	-	0	-	14
OSMAN DR X	36	-	-	-	-	0	-	36
FRYE RD X	49	-	-	-	-	15	-	64
GRAVES ST X	65	-	-	-	-	0	-	65
RADFORD AVE	45	-	-	-	-	15	-	60
MOHAWK LA	16	-	-	-	-	30	-	46
REDDICK AVE	86	-	-	-	-	15	-	101
MARTHA ST X	5	-	-	-	-	-	-	5
Opposite Meineke Muffler	-	-	-	-	-	0	-	0
CENTRAL AVE	12	-	-	-	-	-	-	12
JANNA LEE AVE X	53	-	-	-	-	15	-	68
MT VERN HWY (RT 235)	3	-	-	-	-	0	-	3
LADSON LA X	106	0	-	12	-	15	-	133
SHERWOOD HALL LA	26	-	-	12	-	15	-	53
Gum Springs Center	-	-	-	64	-	-	-	64
Belford Dr.	-	-	-	-	-	0	-	0
KINGS VILLAGE RD	43	-	-	64	-	30	-	137
FORDSON RD (S)	40	-	-	52	-	0	-	92
WOODLAWN TRAIL	52	-	-	58	-	0	-	110
ARLINGTON DR	55	-	-	46	-	0	-	101
LOCKHEED BLVD (Dart Dr.)	81	-	-	41	24	30	-	176
Holly Hill Rd. (opposite)	-	-	-	35	32	-	-	67
GRANDVIEW DR	16	-	-	-	0	-	-	16
Cherry Arms Apts	-	-	-	-	-	0	-	0
PRESTON LA	15	-	-	12	0	0	-	27
EAST SIDE DR	8	-	-	12	0	15	-	35
SCHOOLEY DR	30	-	13	-	0	30	-	73
Beacon Hill Rd.	-	-	-	12	0	-	-	12
BEDDOO ST	23	-	-	12	16	0	-	51
DAWN DR	6	-	-	17	0	0	-	23
REGAN DR	9	-	-	12	0	15	-	36
S KINGS HWY X	32	-	-	23	16	0	-	71
QUANDER RD	14	-	-	6	-	0	-	20
Bell Haven Tower (opposite)	-	-	-	6	8	0	-	14
#6100	3	-	-	-	-	-	-	3
#6034	2	-	-	-	-	-	-	2
Mt. Eagle Dr. (opposite)	-	-	-	6	32	-	-	38
HUNTINGTON AVE	13	-	-	-	-	-	-	13
Total	1173	0	13	572	127	346	24	2255

Note: Upper Case letters denote stop names used by WMATA
X = across from

Table 14

Estimated OmniLink Ridership in Prince William County for Stops along Route 1 or Other Locations in the Corridor
(based on service records for August 23, 2000)

Location	On Route 1	Signed Stop	Total Boardings	Total Alightings
Transit Center on Gideon			0	15
Potomac Mills			336	365
Quantico			24	6
Fuller & JDH*	Yes		8	2
DU10 Anderson	Yes	Yes	15	10
Fire Department	Yes		0	0
TRIANGLE	Yes	Yes	57	21
DU9 Williamstown	Yes	Yes	8	1
DU8 Possum Point	Yes	Yes	3	1
DU7 Rt234	Yes	Yes	10	15
JDH & Wayside	Yes	Yes	0	0
JDH & Cherry Hill	Yes	Yes	4	0
RiverRd & JDH	Yes		7	3
Ferlazzo			40	23
DU3 Neabsco			6	2
DU2 Nova			2	2
DU1 Gideon			4	5
Gideon & Bixby			12	8
DU6 Allen Dent	Yes	Yes	0	2
JDH & FoodLion	Yes		1	4
Main&LibertyVillage			0	5
Main & Acts			0	6
MainLans			4	1
JDH & C	Yes	Yes	4	1
Holiday Inn			2	1
River Oaks shop			1	0
JDH & Occqoquan	Yes	Yes	7	0
Marumsco			48	9
JDH & Belair	Yes	Yes	2	0
JDH & Opitz Blvd	Yes	Yes	82	21
W1 Potomac Hospital			16	7
Featherstone Sq			5	4
JDH @Nursing Home	Yes		1	1
DMV			2	10
Potomac Festival			1	1
Potomac Mills Cl			0	1
Potomac Mills Pl			1	1
JDH & Village	Yes	Yes	3	3
Woodbridge VRE			0	3
JDH & Car Wash			1	1
Potomac Library			0	1
Homeless Shelter			1	0
Total			**718**	**562**

*JDH = Jefferson Davis Highway
**Estimation based on driver manifests provided by PRTC

Roadway Volumes

Estimated 1995 daily traffic volumes on Route 1 as reported in the Route 1 Corridor Study (Nov. 1997) ranged from 11,000 per day south of Dumfries to 83,000 per day just south of the Capital Beltway. There was a general increase in daily traffic from south to north with slightly lower than expected volumes through Fort Belvoir. Traffic volumes throughout the corridor are projected to increase by 2020. The Corridor Study reports projected daily volumes ranging from 55,000 at Quantico to almost 110,000 at the Beltway. The greatest proportional growth is expected in the sections south of Fort Belvoir. New estimates of future year traffic volumes will be prepared for the current location studies.

The Corridor Study projected that, without additional capacity, there would be congestion for many hours each day throughout much of the corridor. This congestion would affect both highway traffic and bus operations. With proposed actions, roadway congestion would not be eliminated, but would be confined primarily to the peak travel hours.

To assess the effect of existing congestion, delay data were collected for morning peak period trips on Route 9A at two times – during August when congestion is significantly reduced when schools are closed and many workers are on vacation, and during September after conditions have returned to "normal." The results are summarized in Table 15. The actual time in motion for the bus was almost identical for both dates even though there was a minor routing change in the interim. Loading/unloading and merging times were quite similar. The major change was in signal delay which increased from 4 to 12 minutes, adding about 15% to the total trip time.

Table 15

WMATA Route 9A Delay Analysis

Northbound Trips from Lorton VRE Station to Huntington Metrorail Station Morning Peak Hour				
	August 30, 2000 (Wednesday) Lv. 7:22 AM		September 22, 2000 (Friday) Lv. 7:29 AM	
	Minutes	Percent of Trip	Minutes	Percent of Trip
Bus in Motion	43.9	77%	43.6	65%
Loading/Unloading	7.5	13%	8.4	13%
Merging into traffic	1.6	3%	1.3	2%
Signal delay	3.9	7%	11.8	18%
Miscellaneous delay	0.0	0%	2.0	3%
Total	56.9	100%	67.1	100%

III. BUS SERVICE AND FACILITY NEEDS

GOALS FOR THE CORRIDOR

The objectives for this study called for recommendations regarding new transit services, modifications of existing services, and new or modified transit facilities in the corridor. Regarding services, the project should recommend the optimal services that would be required for adequate service coverage by type: fixed route, express, feed bus, etc., and seamless transit coverage between the two counties. Among the facilities to be considered are: customer amenities such as bus shelters, bike racks, sidewalks, bicycle paths and ITS facilities and equipment.

Through a process of interviews and focus groups with key interests in the study corridor to discuss transit service and facilities, a broader set of goals for transit in the corridor emerged. These broader goals link transit service and facilities with the surrounding environment. These are described below:

- Provide connections for transit dependent and special needs populations in the corridor to needed services and jobs
- Support corridor economic development with an emphasis on redevelopment, a mix of land uses, higher densities at designated nodes, and higher property values
- Improve pedestrian accessibility and safety in the Route 1 corridor associated with transit services and facilities
- Promote/improve modal connections between bus services, VRE commuter rail and Metrorail
- Provide sufficient transit coverage to serve all major corridor activity centers and fill in remaining service gaps such as between Lorton and Woodbridge
- Provide viable transit options to driving for residents and workers traveling in the Route 1 Corridor
- Support good land use planning and urban design practices in the corridor

COMMUNITY ISSUES AND CONCERNS

The project team conducted 13 key stakeholder meetings and focus groups to identify transit service and facility issues, and broader demographic, employment and development issues or trends that should be recognized in developing the recommended plan. These meetings and focus groups included local elected officials, staff from County agencies, staff from transit agencies, representatives of the two military bases in the corridor, and selected business and resident interests. Over 50 people participated in this initial round of interviews and focus groups. A list of meetings, dates, and attendees is provided in Appendix A. Comments organized by type and by county are provided below.

Several consistent themes emerged in this interview and focus group process. First, there was general acknowledgment that transit service in portions of the corridor was extensive. The focus of all discussions centered around perceived service gaps. In Fairfax County, improved service to the Lorton area was considered a top priority. In Prince William County, the focus was on developing a transit link to Fort Belvoir and on preserving and expanding the park and ride program along the Route 1 Corridor. In both counties, there was an expressed desire to provide east-west transit service, connecting Route 1 with activity centers to the west.

Second, pedestrian safety and accessibility was a major concern of local elected officials and community interests in both counties with a particular emphasis on the Hybla Valley area in Fairfax County and the Woodbridge area in Prince William County. Both areas have racially and economically diverse populations that use transit. Concerns included the provision of safe pedestrian crossing of Route 1, the importance of continuous pedestrian sidewalks along both sides of Route 1 and the need for safer pedestrian linkages across existing parking lots to major destinations, including shopping centers, movie complexes, apartments, etc.

A third theme that emerged through the interviews was the desire of both counties to tie Route 1 back into the mainstream of economic activity in the counties. In Fairfax County, making stronger transit connections to the core and to both the Huntington and Springfield Metro stations, while also physically upgrading Route 1 were viewed as essential to supporting redevelopment. In Prince William County, more emphasis was placed on making physical east-west road connections between riverfront lands, VRE, Route 1, I-95 and points west. In both counties, the discussion focused on redevelopment of existing low-density shopping centers with higher density mixed use development. In Fairfax County, several nodes were identified. In Prince William County, the redevelopment focus was on Woodbridge near the Route 123 interchange.

The following list is a summary of comments from the interviews and focus groups organized by subject and county. These are intended to provide an overview of the interests of key stakeholders but should not be interpreted as a prioritized list of recommended actions.

Table 16
Service Issues Cited in Stakeholder Meetings

Shared Issues:
Need to provide cross-jurisdiction service on Route 1 (between Prince William and Fairfax County)
Fairfax County
Improved mid-day bus service connecting Lorton to the north portion of the Route 1 Corridor
Increased frequency of all mid-day service – should be 20 to 30 minute headways
Need for increased off-peak bus service (diversifying work commute patterns, long shopping center hours)
Need for better transit connections between the Route 1 Corridor and areas to Springfield/Newington
Need to serve the planned Fairfax County Government Service Center
Need more frequent service to Lorton residential developments
Provide enhanced bus connection between the Lorton VRE station and Fort Belvoir
Consider providing direct bus connections (diverting from Route 1) to key shopping centers in corridor – Beacon Hill Mall, Hybla Valley Mall
Provide bus service along Fordson Road (parallel to Route 1 on the west side)
Consider express bus service serving key activity centers and park & rides in the Fairfax County portion of the Route 1 Corridor
Prince William County
Need service from Prince William County park & rides to Fort Belvoir using PRTC OmniRide
Terminate OmniLink service to Quantico at the train station (to be renovated)
Provide limited schedule OmniLink service on Saturdays to Quantico
Provide OmniLink service to Prince William County high schools
Need for transit service connecting the Route 1 Corridor to Manassas via Route 234

Table 17
Facility Issues Cited in Stakeholder Meetings

Shared Issues:
Desire for curb-side peak hour transit lane on Route 1
Need for higher quality shelters with signage and lighting, provision of shelters
Need for sidewalk connections between Route 1 bus stops and major destinations such as shopping centers (often separated by large parking lots and service roads
Need for continuous sidewalks along both sides of Route 1 with landscape buffer strip providing separation from the moving traffic lanes
Need for clearly marked crosswalks at signalized intersections (striping, color change, texture change) to improve pedestrian safety
Fairfax County
Designate and sign a high pedestrian traffic zone from Lockheed Boulevard through Ladson Lane
Improved shelter maintenance
Prince William County
Need to provide a replacement for the Route 234 park and ride lot which will be displaced by road construction (this lot is already oversubscribed)
Provide more park & ride lots along the Route 1 Corridor, including a lot near Ferlazzo Center (Neabsco Road)

Table 18
Demographic, Employment and Development Issues or Concerns
Cited in Stakeholder Meetings

Shared
There are transit dependent and special needs populations in both the Fairfax County and Prince William County portions of the Route 1 Corridor that are dependent on transit to provide access to services and jobs The Corridor's population is becoming increasingly multi-cultural – may need to look at transit signage in several languages or the use of international symbols
Fairfax County
The population in the Corridor is aging, particularly in Mount Vernon and will need services Need to address planned growth in Fort Belvoir's workforce, from 21,000 today up to 36,000 in the future. 6,000 additional employees are projected in the 1st phase of expansion over the next 10 years Plan for the potential of an Army Museum that could be located at Pierce Gate along Route 1 (one of two sites under consideration) Increasing medium and high density residential infill in the Corridor
Prince William County
Focus higher density development and redevelopment in Woodbridge around the planned 123 interchange with Route 1 Incorporate plans for high density mixed use development at Belmont (adjacent to the Woodbridge Transportation Center) Incorporate plans for the funded Marine Heritage Center to be located at Fuller Road and Route 1 (up to 1 million visitors per year) Plan for the potential of up to 3,600 housing units and other development on the Cherry Hill peninsula north of Dumfries (largest undeveloped parcel in the Route 1 Corridor study area)

SERVICE GUIDELINES

Transit agencies must constantly make decisions about services to be operated, including whether a route should be operated and, if service is to be operated, the type of service, the frequency of service and the span of service. Agencies also must make decisions about the facilities to be provided when services are operated. To help in making such decisions, agencies develop and apply service guidelines. These guidelines reflect both historic experience (where have different types of service been effective) and the operating practices of the agencies. The operating practices reflect agency policies related to facilities appropriate for passenger comfort, convenience and safety.

While this study of bus services in the Route 1 corridor was underway, a broader study of the bus services throughout the entire metropolitan area was being conducted for the Washington Metropolitan Area Transit Authority. To aid in that effort, a series of Route Evaluation Measures were prepared. Those measures, in many ways similar to service guidelines, served as the starting point for guidelines applicable to the Route 1 corridor.

The proposed Metrobus study measures were modified for application to the Route 1 corridor, augmented to cover other topics, and reviewed the project committee and the affected operating agencies.

The guidelines have been used in developing the Route 1 Bus Service Plan.

Service Type

Population Density Persons/Square Mile	*Households Per Gross Acre*	*Fixed Route*	*Demand Response*
Less than 3,000	<2	To park-ride lots only	As needed
3,000 - 6,000	2-4	Peak periods	60 minute frequency
6,000 - 12,000	4-8	30 minutes peak/ 60 minutes off-peak	ADA only
Over 12,000	8+	15 minutes peak/ 30 minutes off-peak or better	ADA only

Fixed Route Stop Spacing: 500 to 1,400 fee

Express Service

Express service is appropriate when:

- There is sufficient demand (3/4 of boarding passengers exiting at or near a single destination).
- A time savings of ten minutes end-to-end, compared to local service can be achieved.
- There is sufficient demand at stops in the express service segment to support continuation of a separate local service at an appropriate frequency.

Bus Stop Turnouts

Turnouts at bus stops permit buses to leave the travel lanes while stopping to discharge or pickup passengers. The preferred design for a turnout will include a tapered transition from the travel lane, a deceleration area, stop area, and an acceleration area so that the bus can gain speed before reentering the travel lane and a tapered entry transition. For a roadway operating speed of 45 mph, the desirable length of a turnout for an articulated bus is 1,550 feet.[1] If the acceleration and deceleration are accommodated in the travel lane, the length can be reduced to just under 500 feet.

In higher use areas, such as those found on many portions of Route 1, bus stops are generally spaced between 700 and 1,200 feet apart. With such close spacing, even the minimum turnout design would require most of the distance between two stops. The suggested guidelines for use of turnouts are:

- Turnouts preferred in areas where stops are widely spaced and traffic is light.
- In-lane stops preferred in areas with more closely spaced stops and higher traffic volumes

Bus Stop Location

Near-side or far-side location to be determined based on proximity to trip generators, site uses and other site specific factors. When bus stop turnouts are used, far-side stop locations are preferred.

Bus Stop Features

- All stops shall meet the requirements and guidance of regulations implemented in the Americans with Disabilities Act.
- All stops shall have a hard surface with adequate drainage.
- A bench will be provided at stops expected to have 25 or more boardings per day.
- A shelter will be provided at stops expected to have 50 or more boardings per day.
- Timetable information for all routes serving the stop will be displayed at each stop.
- Lighting will be provided at each stop. A minimum illumination of 1 foot-candle at ground level shall be achieved, either from roadway lighting or special fixtures.
- A signalized pedestrian crossing shall be available within 250 feet of all bus stops.

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[1] Texas Transportation Institute, "Guidelines for the Location and Design of Bus Stops," Transit Cooperative Research Program Report 19, Transportation Research Board, Washington, DC 1996, pp. 28-29.

IV. BUS SERVICE AND FACILITIES PLAN

The recommended plan for bus services and related facilities along the Route 1 Corridor has five components. These include:

- Route expansions
- Modifications to service days and hours
- Transit centers
- Enhanced bus stops and pedestrian connections
- Application of ITS for passenger information and service reliability

A Concept Plan was initially developed based on the analysis of current operations, application of the service guidelines and the issues identified by stakeholders. That Concept Plan was reviewed by the Technical Committee and was presented at five public meetings held in March 2001. Comments received on the Concept Plan are presented in Appendix B. The Concept Plan was refined in response to public comment. The major components of the recommended plan are illustrated in Exhibits 15 and 16.

SERVICE NEEDS

Bus service guidelines as applied to portions of the Corridor suggest the following:

Fairfax County

Occoquan River to Telegraph Road – The areas west of Route 1 are projected to experience continued growth in population with household densities by 2010 exceeding four per acre between Pohick and Lorton Roads and two per acre in most of the area south of Lorton Road. The northern portion of the area currently has roughly hourly all-day and evening service oriented along Route 1 (Route 9A) plus additional weekday peak period services (Routes 303 and 383) connecting the Lorton area to Springfield. The area south of Lorton Road currently has only weekday peak period service to Gunston Road. No Saturday or Sunday bus service is provided.

The southern part of this area could be served either by an extension of the 9A or a new intercounty route. The 9A is already a long route. The possibility of splitting the 9A at Huntington has been raised, although this could require a transfer for through passengers. A route connecting Fairfax and Prince William Counties via Route 1 would be available to riders in this growing area. The linkage of this area, and of Fort Belvoir, to Springfield would be strengthened by instituting midday bus service. Weekend service to the Lorton area can be provided by a Route 1 corridor service – either the 9A or the 105.

Telegraph Road to Mount Vernon Highway (Woodlawn) – Route 1 through this area is boarded on both sides by Fort Belvoir. This currently is an active employment area with significant growth projected over the next twenty years. There is little activity immediately adjacent to Route 1 so that buses must leave Route 1 to serve passengers. Actions now under consideration by the U.S. Army to improve base security, may restrict bus access. Future actions by the Army related to both security and the locations at which new employment sites are developed, will affect bus service needs.

It is important to note that current bus service to Fort Belvoir is provided not only via Route 1 (WMATA Route 9A and Fairfax Connector Route 107), but also via connections to the Franconia/Springfield stations of Metrorail and VRE (Commuter Routes 202 and 304).

The Eleanor Kennedy shelter for the homeless is located on Route 1, just south of Backlick Road. Clients of this facility use the bus services on Route 1. On weekends, bus service is available no further south than the Belvoir Road entrance to Fort Belvoir.

Service improvements implemented to address needs in the area south of Telegraph Road will also address the service issues in this area. An off-street Transit Center would accommodate facilities for the transition from public services to "secure" Fort Belvoir services.

Mount Vernon Highway (Woodlawn) to I-95 (Capital Beltway) – The portion of this area west of Route 1 has household densities generally in excess of four per acre. Densities east of Route 1 are generally lower with much of the area east of Fort Hunt Road and south of Sherwood Hill Road having household densities of two or less per acre. Existing bus services generally exceed the service frequency guidelines. Service issues identified include:

- Lack of Saturday evening service on Connector Route 105
- Lack of capacity in peak hours in the portion of the corridor north of Ladson lane.

For the areas east of Route 1 with lower housing densities, bus service is provided by WMATA Route 9Y and Connector Routes 101 and 102. For many commuters from these areas, park-ride service would also be attractive but park-ride locations in this portion of the corridor are limited.

Issues cited in the public outreach efforts included:

- The lack of direct service to Mount Vernon Hospital in peak hours from areas south of the hospital
- The lack of bus service along Old Mount Vernon Road serving Mount Vernon High School and Riverside Elementary School

The Saturday evening service issue is easily addressed. The 105 serves these areas well at other times and, with sufficient resources, can operate on Saturday evenings.

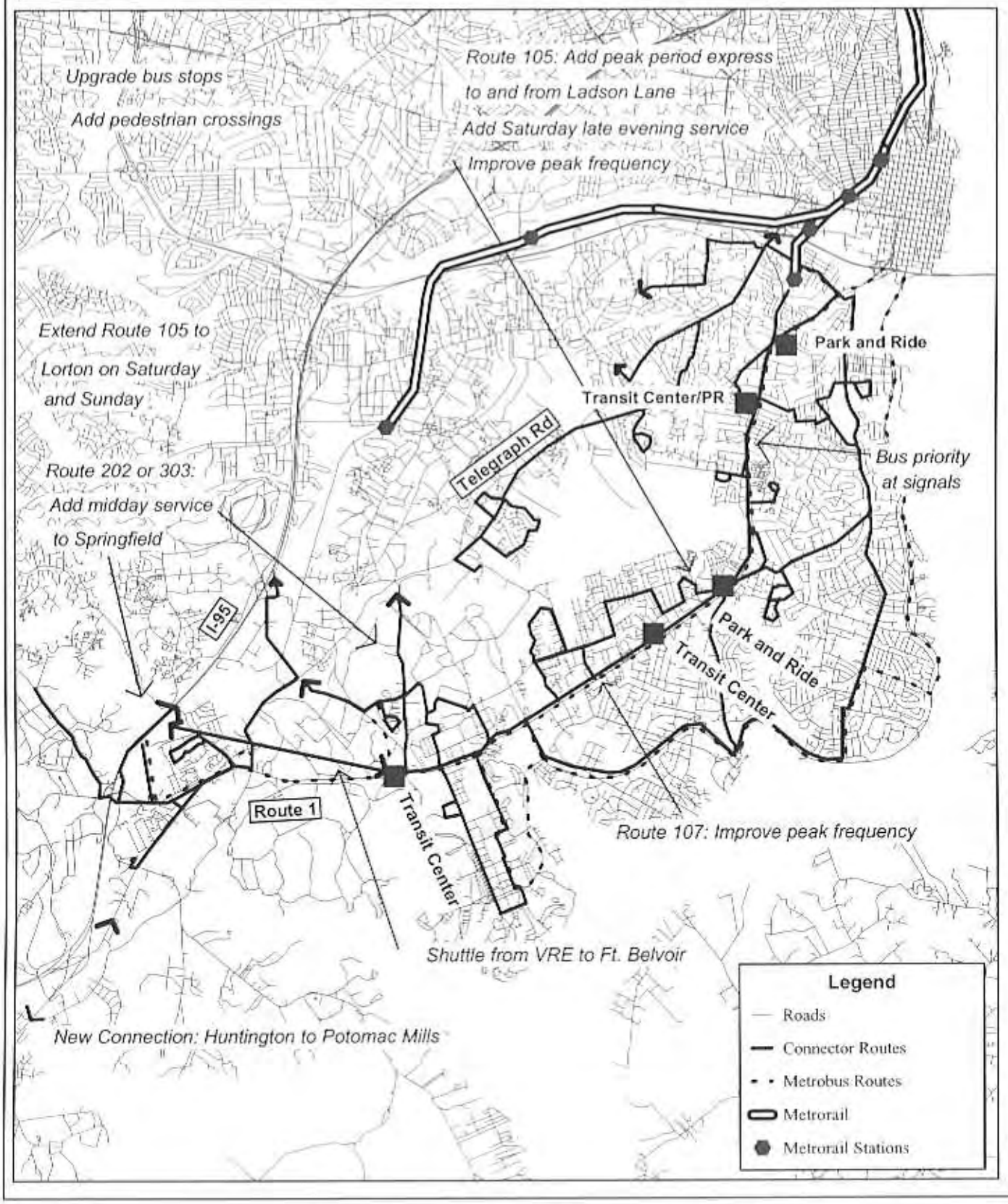
The current capacity constraints in the northern portion of this segment will only be exacerbated by the continuing residential development that is projected. The 9A serves mainly riders traveling to destinations north of Huntington. Adding additional trips on the 105 and 107 in peak hours would relieve current problems and provide capacity to absorb additional growth.

To attract riders from the lower density areas east of Route 1 requires a convenient park-ride location coupled with express bus connections from the park-ride to the Huntington Metrorail Station.

Exhibit 15

Recommended Services and Facilities in the Route 1 Corridor

(Fairfax County)



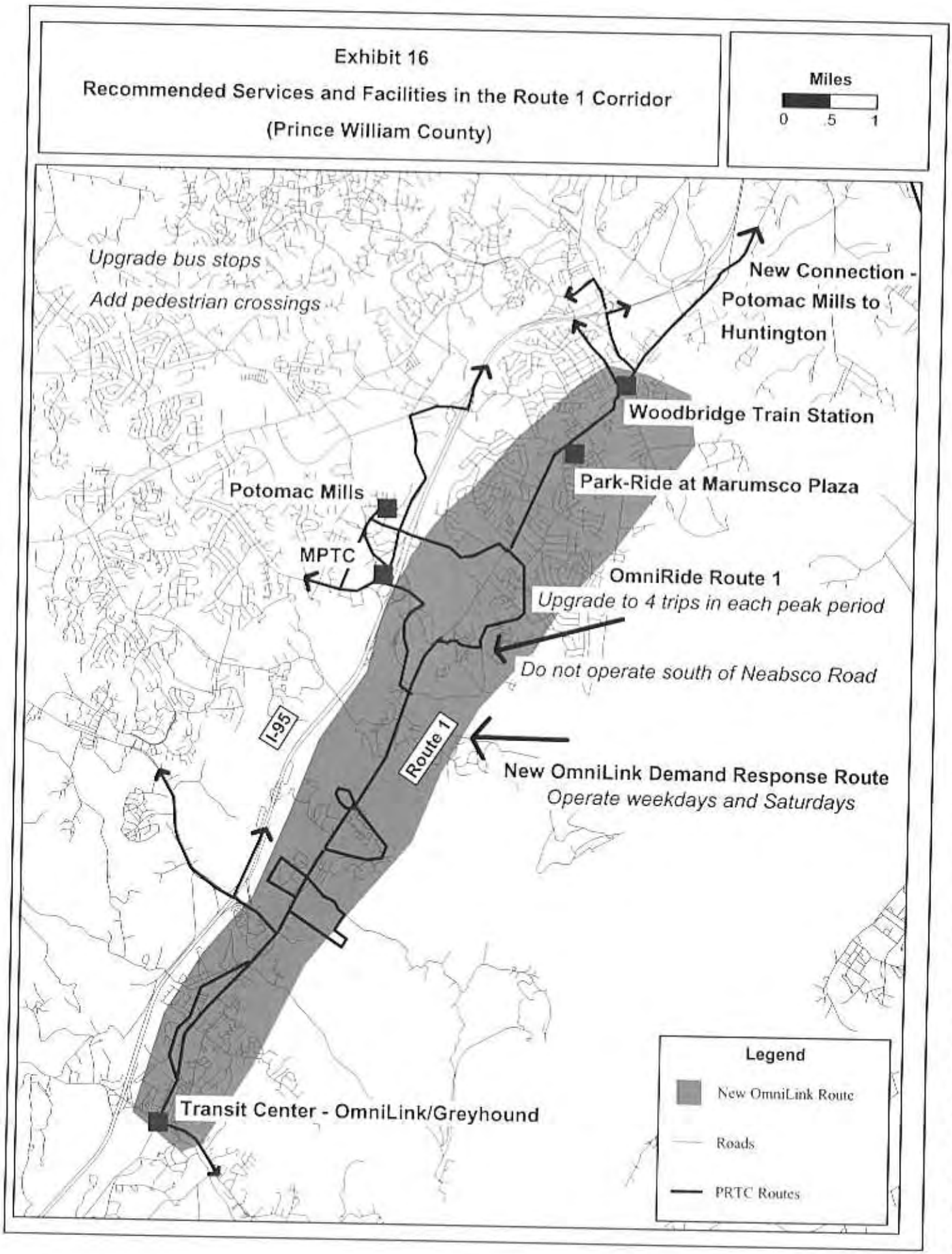


Exhibit 16
Recommended Services and Facilities in the Route 1 Corridor
(Prince William County)
Miles
0 .5 1
Upgrade bus stops
Add pedestrian crossings
New Connection - Potomac Mills to Huntington
Woodbridge Train Station
Park-Ride at Marumsco Plaza
Potomac Mills
MPTC
OmniRide Route 1
Upgrade to 4 trips in each peak period
Do not operate south of Neabsco Road
I-95
Route 1
New OmniLink Demand Response Route
Operate weekdays and Saturdays
Transit Center - OmniLink/Greyhound
Legend
New OmniLink Route
Roads
PRTC Routes

Prince William County

Route 619 to Opitz Boulevard – Except for an area east of US 1 north of Cherry Hill Road, household densities are less than two per acre. Fixed route services are suggested in peak hours with general public demand response service available at least hourly. Services meeting these guidelines are currently provided.

The minimum service span suggested is weekdays until 7:30 PM. This, too, is exceeded by the current service with the evening OmniLink service proving popular. This suggests that Saturday service should be provided with strong consideration of Sunday service.

Discussion with PRTC staff indicates that, as ridership of the OmniLink routes serving this area increases, it is becoming increasingly difficult to serve all demand while maintaining on-time performance. Options to address this problem include limiting the number of demand response requests served on each trip, introduction of a fixed route service or increasing the frequency of the OmniLink demand-response service.

The service guidelines suggest that the primary peak period bus service for this area should be based on park and ride. This requires that adequate park-ride space be available in locations that offer easy access and egress for both customers and transit vehicles.

Opitz Boulevard to Occoquan River – Overall, household densities are in the range of two to four households per acre, but there is greater concentration in selected areas. The minimum local service guideline for peak period fixed route service and hourly demand response service is currently met. The suggested guideline for express commuter services is that at least three trips be provided in each peak period. The current OmniRide Route 1 service offers only one trip in each peak period.

BUS SERVICE RECOMMENDATIONS

Review of existing conditions and projected growth in areas along the Route 1 Corridor relative to the proposed service guidelines indicated that, for the most part, current routes and service levels are adequate but that additional services will be required to meet projected growth. A conceptual plan for service improvement to respond to growth was prepared for review with the project Technical Committee and with staff and members of the Northern Virginia Transportation Commission and of the Potomac Rappahannock Transportation Commissions. In addition, a series of five outreach sessions were held at locations in the corridor to present the plan to representatives of government agencies, social service agencies, business groups and the general public. Comments received at these meetings have been reflected in the recommended service plan presented below and summarized in Appendix B. The bus service enhancements recommended for the corridor are summarized in Table 19.

Table 19
Route 1 Corridor Bus Service Recommendations

	Action	*Comments*
Fairfax County		
Connector Route 105	Add Saturday evening service. Add peak hour trips operating "express" between park-ride near Ladson Lane and Huntington Metrorail Station. Improve from 15 minute to 12 minute frequency in peak periods.	Saturday evening service aids workers. Added peak trips would relieve overcrowding. Express service may be attractive to park-ride patrons. Needed to accommodate projected 20% growth in transit use.
Connector Route 105X	Peak-period trips operating on Route 105 south of Ladson Lane and express between a park-ride area near Ladson Lane and the Huntington Metrorail Station.	Added peak trips will relieve overcrowding. Express service will be attractive to park-ride patrons drawn from areas east of Route 1.
Connector Route 107	Improve from 2 to 4 trips per hour in peak hours with trips scheduled 10 minutes and 20 minutes after 9A trips.	Needed to accommodate projected 20% growth in transit use.
Connector Route 202 or 303	Add midday service from Franconia-Springfield to Fort Belvoir Transit Center and Lorton area.	Provides connection from lower portion of Route 1 Corridor to Springfield.
Saturday and Sunday Service to Lorton	***Service Options:*** Extend 105 to Lorton on Saturdays and Sundays. Extend 9A from Fort Belvoir to Lorton on Saturdays and Sundays. Operate 107 from Huntington to Lorton on Saturdays and Sundays.	Serve Eleanor Kennedy Shelter and growing population in Lorton.

Route 1 Corridor Bus Service Recommendations (Continued)		
Prince William County		
Commuter Services		
South Route 1	Maintain current operation. Add service if required to meet demand.	This relatively new service has proven to be popular.
Route 1	Do not operate south of Cardinal Drive. Explore park-ride at Ferlazzo Building and Marumsco Plaza. Operate 4 trips in each peak period. Operate evening service from Woodbridge to Cardinal Drive.	Minimum service guidelines of three trips per peak period. Route 1 South buses provide service south of Powells Creek.
Local Services		
Woodbridge-Quantico	Add new OmniLink demand response route from Woodbridge Transit Center to Fuller Road at Quantico Marine Corps base entrance. Operate every 45 minutes out of phase with existing Dumfries service. Operate weekdays and Saturdays.	Additional service should permit accepting a greater number of deviation requests. Evening OmniLink service has been popular, suggesting use for shopping and retail employment travel.
Fairfax and Prince William Counties		
Provide Transit Connection from Huntington to Potomac Mills via Route 1 and Woodbridge Transit Center	***Service Options:*** New route operated under Fairfax County/PRTC joint agreement. Extend 9A to Potomac Mills (very long route already). Extend 9A to Woodbridge (requires transfer for through trips). Operate Fairfax Connector service from Huntington to Woodbridge (transfer required). Extend OmniLink service to Fort Belvoir Transit Center (transfer required).	Provides direct connection from Corridor in Prince William County to Fort Belvoir. Supports commute and shopping trips from Fairfax County to Potomac Mills.

Route 1 Corridor Bus Service Recommendations (Continued)		
VRE		
Connection from VRE to Fort Belvoir	***Service Options:*** Existing Route 9A service Dedicated shuttle with timed transfer from Lorton Station. Connection from Woodbridge Station via new Huntington-Potomac Mills route. Coordination with Connector Route 202 from Springfield.	Springfield Interchange survey data show that about 10% of work trips from Stafford and Spotsylvania Counties are destined for Fort Belvoir. VRE seeks to capture this market.

Fairfax County

In Fairfax County the recommended changes to existing services are:

Fairfax Connector Route 105

Saturday evening operations should be added to meet the service span guidelines and to satisfy rider requests. The peak hour service should be increased from 4 trips per hour (one every 15 minutes) to 5 trips per hour (one every 12 minutes) to meet the growing rider demand and relieve current peak hour crowding. The 12 minute service will also match the Metrorail service frequency at Huntington.

Fairfax Connector Route 105X

A park-ride area is suggested at the Multiplex at Ladson Lane. Express 105 trips to and from this location are recommended (4 per peak period) with the goal of attracting riders from the areas east of Route 1 who would otherwise seek to park at Huntington or would not use transit. The express operation will also provide a faster trip for 105 patrons from areas south of Ladson Lane and help to relieve peak crowding on the northern sections of the route.

Fairfax Connector Route 107

Connector route 107 service operates during weekday peak periods between DLA at Fort Belvoir and the Huntington Metrorail station. Selected trips extend to Old Town Alexandria. The 107 operates over much the same route as the WMATA Route 9A. The 9A operates every 30 minutes. The 107 is scheduled also to operate every thirty minutes (2 trips per hour), with times off-set by 15 minutes from the 9A. For riders, the result is a service headway of 15 minutes. Additional service is needed to meet growth in the corridor. It is recommended that the 107 be increased to 4 trips per hour in peak period, scheduled so that, when combined with 9A operations, the result is an effective 10 minute headway.

Midday Service between Lorton and Springfield

The 9A operates all-day service from Lorton to Huntington and north providing good connections to Alexandria, Arlington and Washington DC. There is also a need for other connections from the Route 1 Corridor to other portions of Fairfax County. Connector Routes 202 (Fort Belvoir to Van Dorn via Springfield) and 303 (Lorton to Springfield) now offer peak period service between the southern portions of the Corridor, in Fairfax County, and Springfield. This makes it easier for residents of this portion of the Corridor to travel to destinations such as Merrifield, Tysons Corner, or even, via Connector Route 401 to the Tyson Corner Transit Center, Reston and Herndon. Weekday midday service is recommended with eventual addition of Saturday and Sunday service as demand is demonstrated. This could be operated by either Connector Route 202 or 303. Service via the proposed Fort Belvoir Transit Center is suggested to facilitate transfers between the routes serving Springfield and the other Route 1 bus services.

Saturday and Sunday Service to Lorton

The 9A provides weekday service to Lorton from roughly 5:00 AM to 11:30 PM. No service is available on Saturdays or Sundays south of Fort Belvoir (16th and Belvoir Rd.) In the outreach efforts, the need for extended service on Saturdays and Sundays was noted especially to serve the clients of the Eleanor Kennedy Shelter located on Route 1 near the intersection just south of Backlick Road. Service to Lorton on Saturdays and Sundays is recommended to meet this need and to serve the Lorton area. This service could be provided by extending the Route 9A service as is done on weekdays (alternate trips), by extending the Fairfax Connector 105 on Saturdays and Sundays or by operating Fairfax Connector Route 107 to Lorton on weekend days.

Prince William County

In Prince William County the recommended changes to existing services are:

OmniRide South Route 1

This is a relatively recently instituted service that operates south on Route 1 to Route 234, serves the Park-Ride lot at Route 234 and then travels express to the Pentagon and Washington DC using the HOV lanes on I-95. This service, instituted in response to the construction at the Springfield Interchange, has proven popular and should be retained and expanded in response to growth.

OmniRide Route1

The Route 1 OmniRide operates in the morning north from Triangle making stops along Route 1 to Route 123. It then enters the HOV lanes on I-95 and travels express to the Pentagon and Washington DC. In the afternoon, the route operates from Washington and the Pentagon via the HOV lanes to Route 234. After serving Triangle and Dumfries, the bus proceeds north on Route 1 to Woodbridge. This service is deficient in several ways. Only one trip is operated in each peak period; the service guidelines call for at least three trips. The afternoon routing yields a long trip for riders north of Route 234.

The recommended revisions for this route are (1) cease operations south of Cardinal Drive; revise the Route 1 South operation if needed to serve riders from Triangle and Dumfries, (2) reverse the afternoon operation to leave I-95 at the Occoquan or Route 123 serving the corridor in the reverse of the morning pattern, (3) serve the existing park-ride lot at Route 123 and I-95 and seek to revitalize and promote the existing park-ride agreement with Murumsco Plaza for 515 spaces, and (4) increase service to three trips in each peak period so that riders have a choice.

With the recommended addition of a new OmniLink route, connecting service between the area south of Route 234 and the park-ride lot served by the OmniRide's Route 1 South will be available every 22 minutes.

New OmniLink route - Woodbridge to Triangle

The current OmniLink Dumfries route is the most heavily used of all OmniLink services. This route now averages over 18 passengers per revenue-hour and is so heavily used that it is becoming difficult to provide the deviation necessary to serve areas off Route 1. To meet this growing demand, a new OmniLink route is proposed that would operate between Woodbridge and the entrance in Triangle to the Quantico Marine Corps Base. The current Dumfries route operates every 45 minutes. The new route is proposed also to operate every 45 minutes, but to be off-set from the current route so that riders experience an effective 22.5 minute service frequency. The new route would not operate to Potomac Mills.

Saturday Service

Saturday service is not now available on any of the OmniLink service in Prince William County. The success of the weekday evening service introduced on OmniLink demonstrates that there is a market for work trips outside of traditional work hours and for non-work travel. These markets would benefit from Saturday service. Saturday service is recommended for the current Dumfries route and the proposed new route.

While this recommendation is limited to the identified Route 1 Corridor services, it is recognized that PRTC would likely find it difficult to limit Saturday service to only these routes. Other portions of the OmniLink service area should also be considered as candidates for Saturday service.

Fairfax and Prince William Counties

Huntington-Potomac Mills Connection

There are potential travel markets for movements between the portions of the Route 1 corridor in the two counties. Fort Belvoir is an employment site available to residents of the growing residential communities along Route 1 in Prince William County. Potomac Mills is both a shopping area that can draw shoppers from neighborhoods served by Route 1 in Fairfax County but also an employment site that can provide entry-level and part-time employment for lower income and underemployed persons found in some areas served by Route 1 in Fairfax County.

There is at present no direct bus service connection between Prince William and Fairfax Counties. A resident of the Route 1 Corridor in Prince William County traveling to a job on the Route 1 Corridor in Fairfax County could, in theory, make the trip by transit. The trip would involve using the OmniRide MetroDirect bus to the Springfield Rail Station, a Fairfax Connector trip to the Huntington Station (or a Metrorail trips with a transfer at King Street), and a Fairfax Connector or WMATA 9A trip to the destination. If the traveler were making a peak period trip to a job at Fort Belvoir, he or she could save time by transferring at Springfield to a Fairfax Connector route. A similar trip pattern, in reverse, would be necessary for a Fairfax County resident wanting to travel to Woodbridge or Potomac Mills for a job or for shopping.

On weekdays, there is a gap of less than four miles between the southern end of bus service on Route 1 in Fairfax County and the northern end of bus service in Prince William County. On Saturdays and Sundays, there is no bus service on Route 1 in Fairfax County south of Fort Belvoir. An intercounty bus connection would not only permit more direct transit travel between the two counties but also would make weekday mid-day bus service available to residential units being developed along Route 1 south of Lorton Road and could provide Saturday and, eventually, Sunday service to Lorton.

The year 2000 estimate of intercounty work trips between locations along the Route 1 Corridor prepared by MWCOG (i.e. trips from a residence in one of the counties to a workplace in the other county) was 4,224 per day. It is difficult to gauge how many trips might be attracted to a new bus service. The MWCOG forecasts show an average transit market share of 5.6% for home-based work trips made by residents of traffic analysis zones in the Route 1 corridor in Prince William County. Most of those transit trips are destined to the DC core, Arlington or Alexandria; destinations for which the I-95 HOV lanes provide for express bus transit and at which parking can be difficult or costly. Since the MWCOG process did not include an intercounty bus route, there are no forecasts of market share that would be achieved by such a service. A lower transit share would be expected for travel within the corridor. For this analysis, a transit share of 2%, roughly one-third of the overall transit share for work trips, is used.

A transit capture rate of 2% would be equivalent to 84 work trips per day. Work would not be the only use of an intercounty bus route; the service would also be used by those shopping at retail sites along the corridor, including Potomac Mills, or traveling to other services located on or near Route 1. Based on current projections and activity patterns, a reasonable expectation for an intercounty bus service would be 200 to 300 riders for an 18 hour weekday operation. The actual number of riders would depend on many factors including whether the service were direct (e.g. no transfer) or if a transfer were required between a Fairfax bus and a Prince William bus, the frequency of service, the fare charged and whether the route supplemented or replaced existing services.

A bus route to serve this market is proposed. This service should operate on both weekdays and Saturdays, with Sunday service added when justified by demand. The best service for riders would be provided by a single route operating hourly from the Huntington Metrorail Station along Route 1 to Woodbridge and on to Potomac Mills. This route should not duplicate the 9A service already provided on portions of Route 1 in Fairfax County. Depending on the schedule, this route could replace the 9A trips that operate to Lorton, providing fixed route service along the Route 1 Corridor south of Fort Belvoir.

There are, however, institutional issues that would make it difficult to either operate a WMATA route from Huntington in Fairfax County to Potomac Mills in Prince William County or to replace a portion of the 9A service in Fairfax County. These issues, related to costs of providing service and sharing of subsidy needs by the two jurisdictions, would need to be resolved if a through service were to be provided. Similar issues would arise if the route were operated by Fairfax Connector or by PRTC.

There are other ways in which this connection can be made. These include:

- Extension of 9A from Lorton to Woodbridge. This would make this already long route even longer and could lead to scheduling difficulties even with the long layover at Lorton built into the current schedules. Travel from Fairfax to Prince William County would require a transfer from WMATA to OmniLink at Woodbridge Transit Center/VRE Station. The need to transfer and the added fare would tend to hold down ridership.

- Operation of a Fairfax Connector route from Huntington to Woodbridge, supplementing or replacing some 9A service.

- Extension of the proposed new OmniLink Route 1 route from Woodbridge to Lorton (minimal connection) or to the proposed Fort Belvoir Transit Center (better connection).

VRE/Fort Belvoir Connection

Data collected by VDOT as part of the planning for the Springfield Interchange reconstruction project show that Fort Belvoir is the usual work trip destination for about 9% of commuters from central Stafford County and Spottsylvania County traveling in low occupancy vehicles on I-95. This is equal to the proportion commuting to the Pentagon and only slightly less than the proportion commuting to the District of Columbia. A convenient and reliable bus connection between a VRE station and Fort Belvoir would attract riders to VRE while removing cars from I-95.

The connection that would be most effective in attracting riders would be a dedicated shuttle bus from the closest VRE station to and from major work sites on Fort Belvoir (e.g. DLA, DeWitt Hospital). A dedicated service not only could be scheduled to provide reliable connections to VRE trains, including waiting during the morning commute period for late trains, but also would permit establishing security procedures that would permit the shuttle to operate directly to work sites within secure areas on Fort Belvoir. Management of Fort Belvoir should play an active role in design of a dedicated shuttle service. An alternative connection is available with the current route 9A trips that operate to and from the Lorton VRE Station and serve Fort Belvoir destinations but the operating schedules for the 9A do not provide for good connections to and from the VRE trains. Attempting to adjust the 9A schedules to better meet VRE trains would only disrupt patterns of 9A operations further north on Route 1. Fairfax Connector bus service to and from Fort Belvoir is also available from the Springfield Transit Center served by VRE.

Alternative options include scheduling a new Lorton-Huntington service to meet VRE trains at Lorton and scheduling a new service or an extended 9A service to meet VRE trains at Woodbridge. As the shuttle service option would mainly serve Ft. Belvoir employees, its implementation would require Fort Belvoirs's participation in discussions regarding funding and operations.

PASSENGER FACILITY RECOMMENDATIONS

Making a trip by bus involves far more than simply boarding and riding on a vehicle. A trip by bus also includes walking from the trip origin - often a residence - to the bus stop, waiting some time for the bus, boarding the bus, riding on the bus, exiting from the bus and walking from the bus stop to the destination. A transfer to another bus or transit vehicle may be

required. The return trip involves similar activities but in different locations. Since bus routes tend to be on arterial streets, the daily walk to and from the bus will usually involve crossing a major street at least once each day. If bus travel is to be both a safe and pleasant experience, there must be adequate facilities for all elements of the bus trip. The bus service related facilities recommended for the Route 1 Corridor are those that will attract riders and promote rider comfort and safety.

Bus Stops

The bus stop inventory conducted in August 2000 counted 103 signed bus stops on Route 1 in the study area (Table 20).

Table 20
Bus Stop Count (2000)

	Northbound	*Southbound*
Fairfax County	39	44
Prince William County	11	9

Additional bus stops were, in some cases, located off-street on properties abutting Route 1. The off-street stops are not included in the count. The recommended plan calls for 31 stops, both northbound and southbound, in the Fairfax County portion of the corridor. The reduction is achieved by shifting some stops to off-street transit centers, and combining stops that are close together. Since a signalized pedestrian crossing is designated for provision within 250 feet of all bus stops, northbound and southbound stops are paired at common locations.

In Prince William County, the situation is a bit different. The pattern of development is such that most housing units or other trip generators are set back some distance from Route 1. Since an OmniLink bus will, in response to an advance request, deviate off Route 1 to pickup or discharge passengers, OmniLink's operating plan calls for fewer bus stops (i.e. greater bus stop spacing) than would be suggested for fixed route operations.

The recommended bus stop plan for the Prince William portion of Route 1 calls for fewer formal stops, given the current pattern of development. In developed areas, the plan calls for about two stops per mile. In the four mile area between Featherstone Road and Cherry Hill Road, there is still a significant amount of undeveloped or lightly developed land. Formal bus stops are not yet required in this area, but provision for stops and for appropriate pedestrian crossings will be required when development occurs.

The basic bus stop to be provided at all locations is a hard, paved surface with adequate drainage that complies with all requirements of the Americans' with Disabilities Act, including a clear area at least five feet wide and eight feet deep that can accommodate deployment of a wheelchair ramp or lift. The paved area should be of sufficient length (about 60 feet) so that all doors of an articulated bus will open to a hard surface. Bus stop signs should be provided at all

bus stops, using the standard signs of the agencies serving the stop, along with a display of the bus routes serving the stop, the operating schedule of those routes, the appropriate fares and a phone number for additional information.

At bus stops serving, or projected to serve, twenty-five or more boardings per day a bench is to be provided. At bus stops serving fifty or more boardings per day, a shelter providing protection from rain, snow and wind is recommended. Lighting at a minimum level of one-foot candle, preferably 2 to 3 foot-candles, should be provided either by general street lighting or, if necessary, by specially installed lights.

The recommended bus stop locations are summarized in Table 21 (Locations in Fairfax County) and Table 22 (Locations in Prince William County). In Fairfax County, there are recommended sixty-two bus stops related to current services - thirty-one each northbound and southbound. Shelters plus benches are recommended for twenty northbound and ten southbound locations. Benches only are recommended at six northbound locations. As new bus services are added along Route 1, appropriate stop locations and appropriate facilities will need to be identified and provided.

The placement of the bus stop at any location must reflect the unique characteristics of the site, such as location of a travel generator or a store or public building, driveways serving businesses and topography. In general, far-side bus stops are recommend to reduce conflicts between stopped buses and right-turning vehicles. Special bus turnouts for bus stops are not recommended, although this would need to be revisited should there be a decision to designate HOV lanes in some areas. Such turnouts increase the required width of the roadway right-of-way while introducing delay to buses that must wait for a gap in traffic in order to pull away from the stop after picking up or discharging passengers.

The bus stop in Exhibit 17 illustrates the bus stop facilities recommended at locations with boarding volumes exceeding 50 per day.

Exhibit 17

Example of Bus Stop Facilities at Locations with 50 or More Boardings per Day

Table 21
Recommended Bus Stop Locations on Route 1 in Fairfax County

Existing stop location	Estimated Daily Northbound Boardings	Approximate Distance from Previous Stop (feet) (Northbound)	(Southbound)	Comments
Gunston Road	0	NA	2500	Provide pedestrian crossing with signals
Dutchman Drive	16	2500	800	Provide pedestrian crossing with signals
Cherwek Dr.	0	800	1100	Provide pedestrian crossing with signals
Armistead Blvd	0	1100	2200	Provide pedestrian crossing with signals
Woodside La.	8	2200	13300	Provide pedestrian crossing with signals
Pohick-Telegraph Roads				Current service operates on and stops on Whernside Street.
Fort Belvoir				Proposed office buildings may be developed in this area. Leaving Route 1 to serve buildings is recommended.
Backlick Rd	0	13300	5500	A Transit Center with off-street stops is proposed to permit riders to transfer from public bus to "on-base" secure shuttle service.
WOODLAWN RD (Opposite)	14	5500	2700	Upgrade pedestrian crossing, Provide pedestrian signal
OLD MILL RD (Opposite)	77	2700	1600	Upgrade pedestrian crossing, Provide pedestrian signal
Woodlawn Garden #8801	12	1600	1100	Upgrade pedestrian crossing, Provide pedestrian signal
COOPER RD /Sacramento Dr.	202	1100	900	Upgrade pedestrian crossing, Provide pedestrian signal
WOODLAWN CT (Opposite)	3	900	900	Eliminate stop
LUKENS LA	68	900	900	Upgrade pedestrian crossing, Provide pedestrian signal
HIGHLAND LA (Opposite)	14	900	750	Upgrade pedestrian crossing, Provide pedestrian signal
OSMAN DR (Opposite)	36	750	750	Eliminate stop
FRYE RD (Opposite)	64	750	625	Upgrade pedestrian crossing, Provide pedestrian signal
GRAVES ST (Opposite)	65	625	1050	Eliminate stop
RADFORD AVE	60	1050	1150	Upgrade pedestrian crossing
MOHAWK LA	46	1150	1075	Eliminate existing stops
REDDICK AVE	101	1075	625	Create Transit Center in conjunction with new County Office Building. Provide signalized pedestrian crossing to/from County Building
MARTHA ST (Opposite)	5	625	950	Upgrade pedestrian crossing, Provide pedestrian signal
Shannons Green Way	12	950	800	Eliminate stop
JANNA LEE AVE (Opposite)	68	800	1600	Upgrade pedestrian crossing
Mt. Vernon Hwy (RT 235)	3	1600	650	Upgrade pedestrian crossing
LADSON LA (Opposite)	133	650	800	Upgrade pedestrian crossing
SHERWOOD HALL LA	53	800	900	Create Transit Center/Park-Ride on west side of Route 1
Belford Dr.	64	900	600	Upgrade pedestrian crossing, Provide pedestrian signal
KINGS VILLAGE RD	137	600	1100	Upgrade pedestrian crossing
FORDSON RD (S)	92	1100	975	Combine Belford Dr. and Kings Village Dr. stops;
WOODLAWN TRAIL	110	975	1200	Upgrade pedestrian crossing to Hybla Valley Plaza
ARLINGTON DR	101	1200	1600	Upgrade pedestrian crossing to Mt. Vernon Plaza
LOCKHEED BLVD (Dart Dr.)	176	1600	1400	Upgrade pedestrian crossing, Provide pedestrian signal
Holly Hill Rd. (Opposite)	67	1400	400	Upgrade pedestrian crossing, Provide pedestrian signal
GRANDVIEW DR	16	400	800	Provide pedestrian signal
Collard St. (PRESTON LA)	27	800	1000	Eliminate stop
EAST SIDE DR	35	1000	700	Provide pedestrian signal
SCHOOLEY DR	73	700	600	Combine East Side Drive and Schooley St. stops in single stop
Beacon Hill Rd.	12	600	350	Memorial St. with upgraded pedestrian crossing.
BEDDOO ST	51	350	800	Main entrance to Beacon Mall. Eliminate northbound stop. Transit Center on Beacon Mall. Provide upgraded pedestrian crossings
DAWN DR	23	800	1000	Eliminate stop
REGAN DR	36	1000	2350	Provide pedestrian signal
S KINGS HWY (Opposite)	71	2350	1700	Provide pedestrian signal
QUANDER RD	20	1700	1300	Depends on interchange design; provide pedestrian Penn Daw Plaza and/or Builders Sq. May be Transit Center with Park-Ride at Michael's
Bell Haven Tower (Opposite)	34	1300	800	Upgrade pedestrian crossing
Montebello (Opposite)	38	800	1400	Combine stop with Montebello and install pedestrian signal
HUNTINGTON AVE	13	1400	NA	Combine with prior stop
Total		65300	feet	Retain stop, upgrade pedestrian crossing
		12.37	miles	

Note: Upper Case letters denote stop names used by WMATA

Table 22
Recommended Bus Stop Locations on Route 1
in Prince William County

Existing Stops Cross-street or Landmark	Approximate Distance from Previous Stop (feet) (Southbound)	(Northbound)	Comments
Woodbridge VRE station	NA	4500	Off-street
Occoquan Road	4500	2400	Proposed intersection is wide. Provide adequate crossing time and median refuge for pedestrian
Potomac Plaza	2400	2400	Provide signalized pedestrian crossing
Marumsco Plaza (off-street)	2400	4000	Provide signalized crossing or pedestrian bridge to/from Marumsco Plaza
Bel Air Road	4000	2400	Provide signalized pedestrian crossing
Featherstone Road	2400	22000	Provide signalized pedestrian crossing Assure provision of appropriate bus stop locations and pedestrian crossings from Featherstone to Cherry Hill as abutting land is developed
Cherry Hill Road	22000	2000	Provide signalized pedestrian crossing
Wayside Lane	2000	2300	Provide signalized pedestrian crossing
South of Route 234	2300	1900	Provide signalized pedestrian crossing Provide signalized pedestrian crossing
Possum Point Road	1900	2400	Assure provision of proper bus stops and pedestrian accommodation in interchange design Southbound Route 1 Between Possum Point and Brandy's Hill to be shifted from Main St. to reconstructed Fraley's Blvd. Add stop, with signalized crossing in vicinity of Graham Park Rd
Williamstown Road	2400	3100	
Brandy's Hill Road	3100	1900	Add signalized crossing at Williamstown
Square Lane	1900	NA	Develop off street transit center at or near route 619. Provide for signalized pedestrian crossing.

Applying the standard of providing shelters at bus stops serving fifty or more riders per day, twenty northbound locations in Fairfax County would have shelters. Eight of these would be at new locations; eleven would be replacements of existing shelters. One existing stop with a shelter would be eliminated. Southbound, there are 12 existing shelters. Two of the stops with shelters would be replaced by off-street transit centers (S. Kings Highway, Beacon Hill Road). At the other ten locations, the shelters would be replaced to conform to the corridor standard design.

Pedestrian Crossings

Bus passengers typically need to cross the road at least once a day while walking to or from the bus stop. Route 1, now a four or six lane roadway, is proposed for reconstruction as a six or eight lane roadway, with a median, and a design speed of at least forty-five miles per hour. At intersections, left and/or right turn lanes will be provided at most locations.

Pedestrian accident data for the Route 1 Corridor in Fairfax County are summarized in Appendix C. On average, there is about one pedestrian accident on this portion of Route 1 every two weeks.

To provide for pedestrian safety when crossing Route 1, it is recommended that there be a signalized pedestrian crossing within 250 feet of all bus stops. While this will not eliminate bus passengers attempting to cross the road at unprotected locations, it will provide an alternative and encourage safer behavior. Where possible the pedestrian signals should be incorporated at a signalized intersection; where this is not possible a separate pedestrian crossing with signal should be provided. The time for the pedestrian phase should be based on a walking speed of three feet per second to accommodate less agile bus riders, with sufficient time provided, where possible, for pedestrians to cross not just to the median, but rather the full width of the roadway. A median area of at least ten feet is recommended for pedestrian crossings to increase the distance between waiting pedestrians and moving traffic and to provide adequate refuge for those with strollers or in wheelchairs. The pedestrian phase should be actuated either by push-button or by a detector, so that the pedestrian phase is called only when pedestrians are present.

At several locations where higher levels of pedestrian activity are anticipated:

- Lockheed Boulevard
- Beacon Mall
- Sherwood Hall Lane/Ladson Lane
- Government Center (Mohawk Lane)
- Sacramento Drive

more extensive treatments, including special crosswalk paving and the installation of roadway level crosswalk delineation lights, is suggested.

Conceptual designs for pedestrian crossings and bus stops at several locations are illustrated in Appendix D.

Pedestrian signal indications that display the time left in the pedestrian phase and count-down the time remaining are now in use in Alexandria and Falls Church. If these prove beneficial, they should be used for pedestrian crossings along Route 1.

Sidewalks

Sidewalks or paved paths along Route 1 are necessary for pedestrian access to and from bus stops. Sidewalks or paths are proposed on both sides of Route 1 as part of the roadway reconstruction program.

Transit Centers

A Transit Center is a place designed to be a local area focal point for passenger transportation services. A Transit Center typically will be off-street at a location where several routes meet. The physical facilities at a Transit Center can vary widely. It could be a substantial structure that includes not only a passenger waiting area but also driver accommodations and retail space. It could also be one or two off-street bus bays with several passenger shelters. All transit centers would have, at a minimum, waiting areas that are protected from the weather (although not necessarily climate controlled), good lighting (at least 4 foot candles), enhanced pedestrian access/egress connections, complete route maps, schedules and signing, and landscaping. Where possible, a park-ride area will be available.

When automated vehicle location (AVL) systems are implemented by the transit operators, real time bus arrival information should be available on displays at Transit Centers.

One transit center already exists in the Route 1 corridor. The VRE station in Woodbridge is part of a facility that includes in a specially designed building the train station, a Greyhound bus ticket office and space that can be used for retail. A parking garage is adjacent. The Woodbridge facility is served by VRE, Greyhound and OmniLink.

Seven additional transit centers are proposed for the corridor - two in Prince William County and five in Fairfax County (Table 23). The most elaborate would be a Dumfries/Triangle/ Quantico Transit Center located in an as yet unidentified off-street location close to the proposed Marine Corps Museum at Fuller Road and Route 1. The Center would be designed to serve OnmiLink and Greyhound, providing an off-street location for both operations. A building for ticket sales, baggage and parcel handling, and passenger waiting facilities would be part of such a Transit Center. The other "transit center" suggested in Prince William County is the off-street bus stop area at the Ferlazzo Building at Cardinal Drive. This would provide a location for transfers between the new OmniLink route serving Route 1 and the Dumfries route that serves Potomac Mills. This would also be the southern terminus of the realigned OmniRide Route 1 service. No long-term parking for transit use is proposed for this location.

The five "transit centers" suggested in Fairfax County are Michael's at North Kings Highway, Beacon Mall, Ladson Lane (Multiplex), The Southeast Government Center and Fort Belvoir. Each would serve a slightly different purpose and each would have a different design. Three of these sites - Michael's, Beacon Mall and Multiplex - have previously been suggested for park-ride facilities as part of the mitigation program for the Woodrow Wilson Bridge reconstruction project.

The site at Michael's would be primarily a park-ride facility with transit connections to the Huntington Metrorail station. A separate shuttle service in peak periods would be appropriate to maximize this use.

The site at Beacon Mall is proposed primarily to eliminate the need for transit passengers to cross Route 1 while traveling to and from the Mall. The concept is for a "transit center" that is primarily an enclosed waiting facility situated on the west side of Route 1 in the area now occupied by a frontage road. Southbound buses would need only pull to the curb to stop. Northbound buses would turn left at the Beacon Hill Road entrance to the Mall, right to the

transit facility, and exit at Southgate Drive to return to Route 1. This facility would also serve passengers transferring from Connector Route 103 to bus services on Route 1.

Table 23 Proposed Transit Center Locations	
Prince William County	
Quantico/Triangle	Joint facility to include Greyhound and other intercity services. Park-ride should be developed.
Potomac Mills/MPTC	Major destination for employees and customers. Transfers to other OmniLink routes.
Woodbridge	Existing VRE station. Connections to/from VRE and Greyhound. Connections between OmniLink and WMATA services.
Fairfax County	
Fort Belvoir	Connections between bus services operating on Route 1 and bus services to/from Springfield. This facility should be designed to permit interface between public areas and Fort Belvoir secure areas and connections from public bus routes to Fort Belvoir "secure" circulators.
Southeast Government Center (Buckman and Mohawk)	Major destination for transit dependent population.
Walmart/Multiplex (Ladson Lane)	Destination area. Park-ride proposed as Wilson Bridge reconstruction mitigation measure.
Beacon Mall	Heavy Trip Generator. Park-ride proposed as Wilson Bridge construction mitigation measure.
Michael's (South Kings Highway)	Park-ride proposed as Wilson Bridge construction mitigation measure. Proposed interchange at this location would make pedestrian crossing of Route 1 difficult.

A similar facility may be desirable at Hybla Valley Plaza in the future if the on-going redevelopment is successful.

The Ladson Lane facility is intended primarily as a park-ride area for express bus service to and from the Huntington Station, but it could also serve passengers transferring between the 9A or 107 from the south on Route 1 to the 105 or 106 to Mount Vernon Hospital. Development of a park-ride would require negotiation of an agreement with the owners of the Muliplex and/or the Walmart. This park-ride is intended to attract transit riders from the areas south and east of Route 1.

The Southeast Government Center facility is intended for use by bus passengers traveling to and from government offices or making use of government services to be provided in the new building. A bus passenger facility on the west side of Route 1, the location of the Government Center, will mean that bus passengers do not have to cross Route 1.

The proposed Fort Belvoir Transit Center is intended to serve primarily as a location for transfers not only between the various public bus services operating in the area, but also to special Fort Belvoir services that may be instituted. Two sites have been suggested - one on the north side of the Fairfax County Parkway just west of Route 1 and the other on the east side of Route 1 south of the intersection with the Fairfax County Parkway. These are sites that have also been considered for rail stations should Metrorail be extended from Springfield to Fort Belvoir. The management of Fort Belvoir has indicated that security at the base is likely to become more stringent with additional areas having access restrictions for non-authorized personnel. One result would be to restrict bus access to facilities such as DLA and to new office facilities to be developed. The proposed transit center would provide an off-street location that would permit bus passengers traveling to and from Fort Belvoir facilities to transfer to locally operated circulator buses. This transfer might involve a security check and transition from open to secure areas. The Fort Belvoir transit center can also serve as the primary location for transfers between buses serving the Route 1 Corridor to Huntington and buses serving Springfield.

INTELLIGENT TRANSPORTATION SYSTEMS APPLICATIONS

Intelligent Transportation Systems (ITS) strategies and equipment are based on the concept that the application of newly available technologies for capturing, analyzing and transmitting information can yield benefits to all elements of the transportation system – automobile and truck drivers, transit passengers and operators, and pedestrians. For drivers, the improvements and efficiencies will derive from better, more current information on traffic conditions and alternative routes; real-time control of traffic signals to smooth traffic flow; and automated collision avoidance systems. For transit operators, the benefits will derive from efficiencies related to real-time knowledge of vehicle location and condition. For pedestrians, active ITS applications to enhance safety are under development.

Fixed Route Bus Applications

Intelligent Transportation Systems (ITS) concepts and equipment offer the potential for improvements in the operations of bus services and in the provision of information about bus services to both current passengers and potential riders. The primary components of ITS as applied to fixed-route bus services are:

- An Automated Vehicle Location (AVL) system that delivers to a database system real-time information on the location of vehicles
- One or more systems for processing and dissemination of bus location data

Given the nature and requirements of these systems, it is unlikely that they would be implemented only in the Route 1 Corridor. An effective application requires a central system capable of receiving and processing AVL data. The effectiveness of the system requires that the entire fleet of vehicles that will be operated be equipped with AVL capabilities. When a full transit ITS is implemented, it would probably apply to all bus services in Northern Virginia or even all services in the Washington Metropolitan Area. Facilities in the Route 1 Corridor should be designed to take advantage of the ITS systems as they are implemented and could even serve as a demonstration of selected components.

The primary application of ITS includes improvements in operating efficiency and improvements in information to passengers.

Operating Efficiency

Improvements in operating efficiency derive primarily from monitoring the on-time performance of bus operations and, as appropriate, taking steps to reduce bus delays. Real time AVL data, coupled with other data transmitted from vehicles in operation, can be used to:

- Determine if buses are operating on-time and how schedule adherence varies throughout the day
- Determine how much of the time required to serve a route is devoted to in-motion time, to passenger boarding and alighting time, and to stopped delay.

One ITS operating efficiency component that can be developed in the Route 1 Corridor without requiring full system implementation is the provision of bus priority at intersections. Bus priority systems at traffic signals sense when a bus is approaching an intersection. Depending on the status of the traffic signal, the system can either extend the green signal phase to permit the bus to pass through the intersection or can initiate an early termination of the red phase so the bus can proceed.

In its simplest form, a bus priority system is implemented by equipping buses with a mechanism to transmit the message "A bus is here" and equipping the traffic signal controller with both a receiver for this signal and control logic to take actions necessary to permit the bus to proceed with minimal delay. A system of this type can be implemented only at specific intersections and does not require equipment on all buses.

A more sophisticated approach to bus priority requires a more "intelligent" system. In this application, the message transmitted by the bus is not just "A bus is here," but rather "The bus operating the 7:09 AM trip on Route 105 is here." The controller receiving this signal then checks against a centralized database to determine if this trip is on-schedule, ahead of schedule or behind schedule. Only if the trip is behind schedule is action taken to provide bus priority.

Traffic signal systems installed as part of the Route 1 Corridor project should have the capability to implement either approach to bus priority. The initial applications should be provision of priority to northbound buses making the left turn to enter the transit centers at Ladson Lane and at Beacon Mall. Subsequent applications would address bus priority for buses entering and leaving the Woodbridge Transit Center in Prince William County and the Transit Centers/park-ride lots proposed at South Kings Highway and at the Southeast Government Center in Fairfax County. Transit travel signal priority at the Transit Centers proposed for Fort Belvoir in Fairfax County and the Fuller Road Transit Center near the entrance to the Quantico Marine Base in Prince William County should be developed when these facilities are implemented.

Passenger Information

Waiting for a bus is considered by many to be one of the most onerous components of a trip by public transit. Research on choice of mode has consistently shown that, when making the decision to travel by transit, time spent in waiting for a vehicle is perceived by travelers as two to three times more important than time spent in a vehicle. Reducing the discomfort of waiting for the bus can be achieved by improving the conditions under which the wait occurs (e.g. by offering a paved area and a bench or shelter) and by providing the passenger with assurance that the bus is coming and will arrive in the near future.

Once an AVL system is in place, the position of each bus is "known" at all times. With this knowledge, the information system can determine, based on the distance from the current location to the stop of interest, the expected travel time. This information can then be made available to passengers.

The mechanisms for conveying expected bus arrival times to passengers can include special display units located at bus stops and activity centers or Internet access with the passenger's computer or cell phone. Special display units would be provided at all Transit Centers (Michaels', Beacon Mall, Ladson Lane, Southeast Government Center, Fort Belvoir, Woodbridge, Fuller Road/Quantico) and in other major facilities along the route such as the Ferlazzo Building in Prince William County and office buildings as they are developed.

Pedestrian System Applications

At locations where pedestrians are expected to cross a roadway, it is common practice to provide special traffic signal displays for pedestrians and to include a special traffic signal phase providing pedestrians with sufficient time to walk across the intersection. This crossing time has often been computed based on a walking speed of four feet per second, so that 30 seconds would be allotted for a pedestrian to cross a 120 foot wide roadway. The upcoming AASHTO manual on pedestrian facilities may suggest use of 3.5 feet per second as the walking speed.

Providing an adequate crossing time is essential for pedestrian safety, but not all pedestrians walk at the same speed. Allocating too much time for the pedestrian phase reduces the capacity of the roadway; providing too little time creates a hazard, especially for pedestrians who are elderly or disabled. Since roadway capacity is further reduced if the pedestrian phase is provided when no pedestrians are present, traffic signals are often set up so that a pedestrian wishing to cross must push a button to request activation of the crossing phase. Pedestrians often fail to do this, choosing to cross on the shorter vehicle phase.

The U.S. Department of Transportation is supporting development of adaptive pedestrian signals that use ITS technologies both to sense the presence of waiting pedestrians, so that the signal controller receives a call to activate the pedestrian phase, and the presence of pedestrians in the crosswalk so that the pedestrian phase length can be shortened or extended as required. These systems are not yet sufficiently developed that they could be specified for installation as part of the Route 1 Corridor project, but the signal systems that are installed should be capable of making use of these technologies as they become available.

IMPLEMENTATION COSTS

Estimated annual costs for bus service changes and capital costs for new facilities are summarized in Tables 24 and 25, respectively.

Bus operating costs are estimated using a flat unit cost per revenue vehicle-hour for each of the services in the corridor – WMATA, Fairfax Connector, OmniRide and OmniLink. For the WMATA and Fairfax Connector estimates, the per platform-hour unit costs supplied by Fairfax County are multiplied by 1.2 to estimate revenue-hour rates. The costs shown are the increment over and above the cost of current services.

The conversion from daily to annual costs is based upon the following recommended service pattern. Weekday service on the following holidays – Martin Luther King Jr. Birthday, Presidents Day, Columbus Day and Veterans' Day; Saturday service on Memorial Day, Independence Day and Labor Day; Sunday service New Year's Day, Thanksgiving and Christmas. This yields effectively 255 days with weekday service, 55 days with Saturday service and 55 days with Sunday service.

The estimated annual added cost for bus service additions (Table 24) is $2.6 million – $850,000 for Fairfax County, $850,000 for Prince William County and $900,000 for services attributable to both jurisdictions.

Table 24

Route 1 Corridor Bus Studies
Operating Cost Estimate

All costs in Year 2000 dollars - escalation and inflation not included

Operating Costs - Increment over and above existing services

Route		Hours per Round Trip	Trips per day	Revenue Veh-Hours per day	Days per year	Annual Revenue Veh-Hours	Annual Cost
Fairfax County							
105	12 min. frequency peak service	2	6	12	255	3,060	$139,536
105	Saturday evening service	2	4	8	55	440	$20,064
105	Extend Saturday service to Lorton	1	17	17	55	935	$42,636
105	Extend Sunday service to Lorton	1	14	14	55	770	$35,112
105 X	Express (4 trips/pk period)	2	8	16	255	4,080	$186,048
107	2 additional trips per peak hour	2	12	24	255	6,120	$279,072
202 or 303	Midday service at 45 min frequency	1.5	8	12	255	3,060	$139,536
Prince William County							
OmniRide Route 1	Additional trips (weekdays)	2	6	12	255	3,060	$161,935
New OmniLink	Triangle - Woodbridge (weekdays and Saturdays)	2	18	36	311	11,196	$592,492
OmniLink Dumfries	Saturday service	2	16	32	56	1,792	$94,833
Fairfax and Prince William							
New Route	Huntington to Potomac Mills via Woodbridge	3	18	54	310	16,740	$763,344
VRE							
	Lorton Station to Fort Belvoir Shuttle	1	12	12	255	3,060	$139,536
Annual Total Operations							$2,594,144

The estimated cost for capital facilities is (Table 25) $7.3 million -- $5.3 million in Fairfax County and 2.0 million in Prince William County. This does not include costs that might be incurred for the purchase or lease of needed property or the cost of sidewalks and paths that would be developed as part of the roadway reconstruction project.

Table 25

Route 1 Corridor Bus Studies
Facility Cost Estimate

All costs in Year 2000 dollars - escalation and inflation not included

Fairfax County						
Bus stop improvements (31 NB and 31 SB)	62	stops @	$20,000	per stop	=	$1,240,000
Major transit centers (Fort Belvoir, Beacon Mall)	2	@	$500,000	each	=	$1,000,000
Minor Transit Centers (SE Gov't Center, Ladson La., Michael's)	3	@	$125,000	each	=	$375,000
Pedestrian Crossings						
Major upgrades	6	@	$125,000	each	=	$750,000
Enhancements	25	@	$75,000	each	=	$1,875,000
Note: Enhancements include illuminated crosswalks at $20,000 ea. plus installation						
Sidewalk improvements	To be developed as part of Route 1 reconstruction					
Prince William County						
Bus stop improvements (11 NB and 11 SB)	22	stops @	$20,000	per stop	=	$440,000
Major transit center (Dumfries)	1	@	$500,000	each	=	$500,000
Minor Transit Center Ferlazzo Building	1	@	$125,000	each	=	$125,000
Pedestrian Crossings						
Major upgrades	1	@	$125,000	each	=	$125,000
Enhancements	11	@	$75,000	each	=	$825,000
Note: Enhancements include illuminated crosswalks at $20,000 ea. plus installation						
Sidewalk improvements	To be developed as part of Route 1 reconstruction					
Total Facilities						$7,255,000

OTHER ISSUES

There are a number of issues related to bus services in the Route 1 Corridor that merit further consideration but are beyond the scope of these studies. These include fare compatibility, deviations to serve locations off Route 1, and institutional issues related to the operating entity for specific services.

Fare Compatibility

The fare for Route 9A, operated by WMATA, is $1.10. The fare for Fairfax Connector services (Routes 105, 106 and 107) is $0.50. For a trip involving a transfer to Metrorail at Huntington, the fare for the entire trip would be the bus fare (either $0.50 or $1.10) plus the Metrorail fare. For a trip involving a transfer from Metrorail, the fare is the Metrorail fare plus a transfer charge of $0.25 for either the 9A or a Fairfax Connector route.

The difference in fare contributes to some imbalance in the bus loadings, particularly for travel northbound to Huntington.

The difference between the WMATA bus fare and the Fairfax Connector bus fare also means that some riders pay different fares for essentially the same trip. For example, clients of the Eleanore Kennedy shelter can ride the 107 in peak hours and pay only 50 cents. At other times, they must use the 9A and pay $1.10.

The IMP building on Route 1 at Old Mill Road, housing some County social service functions, is now served by Connector Route 105 with a fare of 50 cents. These services will likely be relocated to the new Southeast Government Center when that building is complete. The Southeast Government Center is served, outside of peak hours, most directly by the higher fare 9A. The closest stop on the lower fare 105 is about three blocks from the site on Buckman Road at Russel Road.

Deviations off Route 1

Service between Huntington and Woodlawn along Route 1 is provided by the WMATA 9A and by Connector Routes 105, 106 and 107. The 9A operates only on Route 1 in this area. The 105 operates through the day (5:00 AM to Midnight, weekdays). South of Buckman Road, the 105 serves the neighborhoods west of Route 1. North of Buckman Road, the 105 operates, in peak hours, only on Route 1. In off-peak periods, the 105 deviates off Route 1 to serve Mt. Vernon Hospital and the Mt. Vernon Square Apartments.

In peak hours, the 106 operates between Mt. Vernon Hospital and Huntington with a deviation to serve the Mt. Vernon Square Apartments. Also in peak hours, the 107 operates between Fort Belvoir (DLA) and Huntington along Route 1. Selected 107 trips (3 in each peak period) also serve Old Town Alexandria. The 107 deviates from Route 1 to serve Lockheed Boulevard at Fairchild Drive.

An option that merits study to determine operational feasibility is elimination of the Lockheed Boulevard deviation from Route 107 with this area served, instead, by an additional deviation of the 106. While this would add four to five minutes in each direction to the 106 schedule, a similar amount of time would be removed from the longer 107 trips. The 107 would clearly be the direct route with the 106 the deviation route.

Route 9A Options

The 9A is a WMATA regional route operating from the Pentagon in Arlington County through Alexandria and into Fairfax County. The route is long. A typical midday trip from the Pentagon to Fort Belvoir is scheduled for 78 minutes. In 2000, alternate 9A trips were extended to Lorton, resulting in a trip time from the Pentagon of 101 minutes. A full Pentagon to Lorton round-trip, including layover, requires over three-and-a-half hours. Extension further south in Fairfax County or to Woodbridge would lengthen the route even further. When a route is that long, it is difficult to maintain on-time performance due to variations in traffic conditions and passenger loadings.

The possibility of splitting the 9A at Huntington has been discussed. Such a split would permit easier scheduling of service to match demand on each segment and would provide better schedule adherence. Splitting the route, however, would force riders traveling on the 9A beyond Huntington to transfer for what is now a one seat ride.

One possibility for consideration is allowing the 9A to revert to operation only to 16th and Belvoir on Fort Belvoir, deleting the extension to Lorton added in 2000. Under the present weekday operating pattern, the 9A operates every half-hour north of Fort Belvoir. Half of the southbound trips terminate at Fort Belvoir; the other half continue to Lorton. The revised operating pattern would retain the 9A trips to Fort Belvoir. but terminate the 9A Lorton trips at Huntington. These would be replaced by an expanded Connector Route 107 service operating all-day between Huntington and Lorton with possible extension to Woodbridge. This service would also operate on Saturdays.

Operating a Connector 107 service in this fashion would make the $0.50 fare available to travelers to and from Lorton, to clients of the Eleanor Kennedy homeless shelter and to persons using the bus to travel to the new Fairfax County southeast Government Center now being developed on Route 1 at Mohawk Street.

Note that under the current service plan, the 107 operates in peak hours between DLA at Fort Belvoir and Huntington at a 30 minute interval. The 9A also operates from Fort Belvoir at a 30 minute interval yielding an effective 15 minute headway in peak periods for service between Woodlawn and Huntington. The recommended service improvements would double the number of 107 trips in peak hours, yielding an effective 10 minute service frequency.