NORTHERN VIRGINIA BUS SERVICE COORDINATION PLAN

NVTC

SECOND ANNUAL REPORT

NORTHERN VIRGINIA TRANSPORTATION COMMISSION

September 1986

ABSTRACT

In describing progress during the second year of NVTC's Bus Service Coordination Plan, and setting directions for the third and succeeding years, this report is organized according to four central themes:

- Problems and solutions pertaining to passenger connections between transit systems;
- Problems and solutions with information provided to passengers and policy makers about the availability and future directions of public transit services;
- Difficulties and remedies involving the efficiency with which transit systems perform; and
- Existing and future financial conflicts and proposals for resolving them.

In succeeding sections of the report, current and future patterns of use of this region's diverse transit network are illustrated. Problems arising from these patterns are identified, according to the four themes.

Subsequently, solutions to the problems are set forth in each of the four categories. For example, in the improved connections section, the findings of NVTC's program of market research are described, as a means to identify unserved transit markets. In the information section, NVTC's campaign to provide the public with accurate cost comparisons between transportation modes using the Commission's auto/transit cost model are described. In the performance section, applications of NVTC's automated ridecheck database are given, as a means to help transit planners upgrade bus routes. Finally, in the finance section, private sector initiatives being pursued by NVTC are examined as a means to help meet growing financial needs.

A brief conclusion and a set of appendices conclude the report.

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I. INTRODUCTION

In early 1984 the Northern Virginia Transportation Commission initiated its Bus Service Coordination Plan by adopting a set of goals:

- o Improve transit information sharing within the region;
- o Provide better coordination of bus planning and service; and
- o Improve bus service benefits relative to costs.

During the first year of the ongoing coordination planning process, the Commission concentrated on gathering data, defining processes, and producing prototype products, with primary emphasis on restructuring bus service in the corridor served by Metrorail's Orange Line extension to Vienna. In September 1985, NVTC released a lengthy report describing and evaluating existing resources and reporting on new initiatives for promoting transit and enhancing coordination. Since that time, the Commission's coordination planning process has continued, and this second annual report describes further progress.

The Commission's planning process builds on the base of its earlier efforts; the first and second annual reports are complementary and should be read together. For example, the first annual report describes in detail why the plan was undertaken, and how it is to be accomplished. The first report also provides detailed explanations of several new planning tools developed by NVTC. This second annual report concentrates on the

Figure 1

NVTC OFFICERS AND COMMISSIONERS

--1986--

John G. Milliken, Chairman
George T. Snyder, Jr. Vice-Chairman
Bernard S. Cohen, Secretary-Treasurer

Arlington County

Ellen M. Bozman*
Michael E. Brunner
John G. Milliken

Fairfax County

Joseph Alexander*
Nancy K. Falck**
Elaine McConnel
T. Farrell Egge
John F. Herrity

City of Alexandria

James P. Moran, Jr.
Robert L. Calhoun**

City of Fairfax

George T. Snyder, Jr.

City of Falls Church

Carol W. DeLong

Virginia Department of Highways and Transportation

Sally H. Cooper

General Assembly

Senator Joseph V. Gartlan, Jr.
Senator Edward M. Holland
Delegate Bernard S. Cohen
Delegate Robert E. Harris
Delegate James F. Almand

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* Principal member of Metro Board
** Alternate member of Metro Board

implementation of the planning process and describes the results of applying the new tools.

A. ROLE OF NORTHERN VIRGINIA TRANSPORTATION COMMISSION

NVTC was created by the Virginia General Assembly in 1964, and consists of 18 Commissioners representing five Northern Virginia jurisdictions and the Virginia Department of Highways and Transportation. Figure 1 shows the current membership.

NVTC provides a public transportation policy forum for the region, and is charged with allocating over $35 million in state and Federal aid each year among its member jurisdictions. The Commission also appoints Virginia's two principal and two alternate members of the Board of Directors of the Washington Metropolitan Area Transit Authority (WMATA or METRO). WMATA operates Metrobus and Metrorail service in the District of Columbia, Maryland, and Northern Virginia.

While NVTC does not operate permanent transit service, it does sponsor demonstrations, such as private taxis serving Metrorail stations in lieu of more expensive bus service. The Commission has assumed an active role in coordinating transit services in Northern Virginia, and is working with local governments to maintain stable and reliable funding for these services. NVTC also seeks to improve transit connections and provide better information for passengers, while upgrading performance of transit operators. Marketing transit services is an area of intense current interest on the part of the Commission.

The Commission publishes a Handbook each year, which describes its structure and programs in considerable detail. Copies are available free from NVTC upon request.

B. OVERVIEW OF THE PLAN

NVTC's Bus Service Coordination Plan is not a typical government plan, in which routes are drawn on a map or specific equipment needs identified. Rather, the Commission's plan is a process which seeks to accomplish improvements by subtle changes in the way local jurisdictions think about and solve transportation problems. Thus, the NVTC plan can never be "complete;" the process must be continually enhanced and revised to accomplish steady progress toward its objectives. The annual reports that describe the process and the progress are, therefore, more on the order of dynamic proposals rather than static blueprints. The reports set forth strategies across a broad front for coping with congestion and coaxing more productivity from scarce transportation resources.

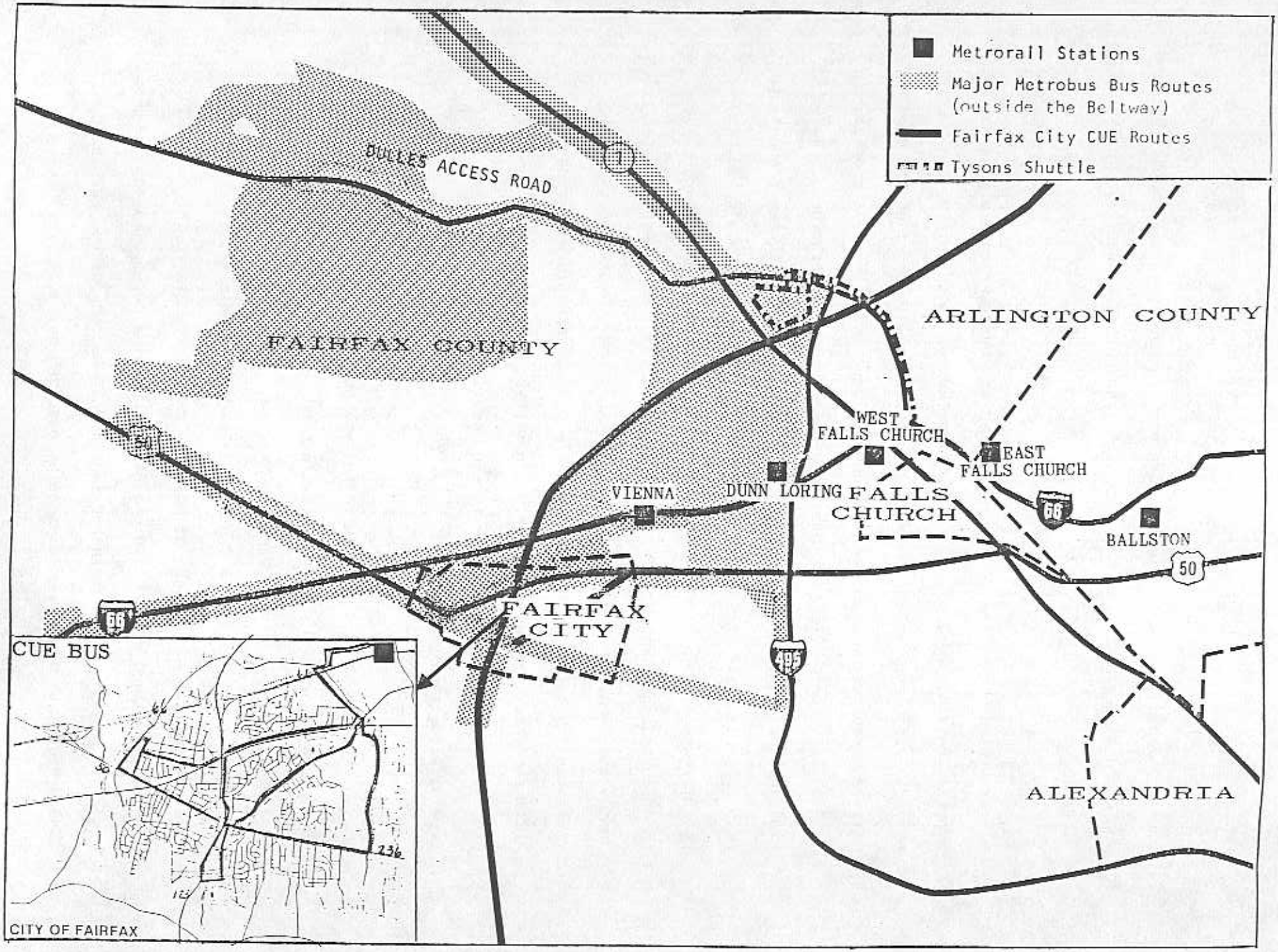
The genesis of the Commission's planning process was Virginia Senate Resolution #20, passed in 1983, that directed NVTC and the Virginia Department of Highways and Transportation (VDH&T) to conduct a thorough study of bus transportation in Northern Virginia. The resulting 1983 study (Report on the Feasibility and Desirability of Locally Sponsored Bus Service in Northern Virginia) concluded that while NVTC should not promote decentralization of bus service outside the regional network operated by Metro, it should take an active role by developing a bus service management plan. That plan should examine feasible options for planning,

routing, scheduling, establishing fare structures, operating, marketing, and coordinating a diverse set of public transportation needs in Northern Virginia.

As stated above, the Commission agreed to undertake such a plan and adopted the goals of improved information, better coordination, and enhanced efficiency in early 1984. The first annual report on the Bus Service Coordination Plan was published in September 1985. It provides a full description of how the planning process has been structured. As explained in the first report, the Commission developed 18 new products to help accomplish its coordination mission. Many of these new products were computerized tools for analyzing and improving transit performance, such as an automated ridership reporting system. Other tools were designed to improve the quality of service for passengers and elevate general understanding of how Northern Virginia's transit operators provide interconnected transportation (e.g., marketing plan and auto/transit cost model). Still other tools were focused on financial analysis (e.g., subsidy allocation model).

In the year since the first report was published, the Commission has honed these tools and developed others, and applied them primarily to the opening of the four new Orange Line Metrorail stations (Vienna, Dunn Loring, West and East Falls Church). The Commission's series of planning sessions and public hearings on bus service adjustments in the Orange Line corridor, combined with active planning of opening ceremonies for the new bus and rail services, culminated in a highly successful opening in June 1986. Ridership has exceeded expectations, and services provided by

Figure 2
ORANGE LINE CORRIDOR



several local jurisdictions, NVTC, and private providers are working in concert to serve passengers in this corridor. Figure 2 illustrates the Orange Line corridor.

C. SUMMARY OF THE SECOND ANNUAL REPORT

In describing progress during the second year of NVTC's Bus Service Coordination Plan, and setting directions for the third and succeeding years, this report is organized according to four central themes:

- Problems and solutions pertaining to passenger connections between transit systems;
- Problems and solutions with information provided to passengers and policy makers about the availability and future directions of public transit services;
- Difficulties and remedies involving the efficiency with which transit systems perform; and
- Existing and future financial conflicts and proposals for resolving them.

In the next section of the report, current and future patterns of use of this region's diverse transit network are illustrated. Problems arising from these patterns are identified, according to the four themes listed above. Thus, the adverse effects on passenger connections of

severe traffic congestion near Metrorail stations are identified, as are the effects of a shortage of clear station signs on adequate transit information, an absence of up-to-date ridership counts by bus route on measuring transit performance, and forecasts for significant future rehabilitation costs of the Metro System on the region's ability to finance its transit network.

Subsequently, solutions to the problems are set forth in each of the four categories. For example, in the improved connections section, the findings of NVTC's program of market research are described, as a means to identify unserved transit markets. In the information section, NVTC's campaign to provide the public with accurate cost comparisons between transportation modes using the Commission's auto/transit cost model are described. In the performance section, applications of NVTC's automated ridecheck database are given, as a means to help transit planners upgrade bus routes. Finally, in the finance section, private sector initiatives being pursued by NVTC are examined as a means to help meet growing financial needs.

A brief conclusion and a set of appendices conclude the report.

Figure 3

LOCAL TRANSIT SERVICES

Systems	Number of Vehicles	Number of Employees (staff-years)	Average Daily Passengers (System only)	FY 1987 Annual Operating Budget
Metrorail	536	3,400*	411,644	$213,310,000
Metrobus	1,562	4,286*	442,246	$240,895,000
Fairfax Connector	33	60	3,350	$ 2,538,302
Alexandria Dash	19	47	4,599	$ 1,176,091
Fairfax City Cue	8	16	1,400-1,500	$ 566,296
Reston RIBS	3	**	220	$ 174,426

* Non-construction, grant administration, and rail start-up related.

** Provided under private contract

II. PUBLIC TRANSPORTATION SYSTEMS IN NORTHERN VIRGINIA

Because NVTC's Bus Service Coordination Plan is primarily concerned with integrating the services provided by diverse public transportation operators, it is appropriate to begin with a synopsis of the types of services rendered in the region. The primary service provider is, of course, WMATA with its massive Metrorail and Metrobus networks, but a host of other government entities and private firms provide service on a smaller scale.

Figure 3 lists the local transit services, and reports the number of vehicles, employees, daily passengers and annual operating budgets.

Figure 4 provides information on regional commuter bus services, all of which are privately operated, although Prince William County provides a subsidy to a private management firm to operate County-owned buses.

A. WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

WMATA was created by interstate compact in 1966. It has planned, developed, and now operates and finances the rapid rail and regional bus transit system for the Washington metropolitan area. A 12-member Board of Directors (six principals and six alternates) controls the Authority. NVTC appoints the four Northern Virginia members.

Figure 4

COMMUTER BUS OPERATORS IN NORTHERN VIRGINIA

Company	Scheduled AM Peak Trips	Estimated AM Peak Passengers	Areas Served
Aries	1	40	Fredericksburg, Stafford Co.
Bus Leasing Services	20	541	Prince William (I-95 & I-66 corridors)
Coleman*	2	40	Mantua
D & J	6	240	Spotsylvania Co., Stafford Co., Fredericksburg
Greyhound	1	43	Fredericksburg
Lee Coaches	3	120	Fredericksburg, Stafford Co.
Sterling Commuter Bus	3	104	Sterling, Sterling Park, Sugarland
Trailways	1	35	Fredericksburg, Warrenton, Fairfax City
Virginia Motor Coach	23	600	Spotsylvania Co., Stafford Co.
White's	4	146	Spotsylvania Co., Stafford Co., Fredericksburg

* Since the survey was completed in May 1986, Coleman Coach began serving Fairfax City in June 1986.

Source: COG Survey (May, 1986)
NVTC Phone Surveys of Operators

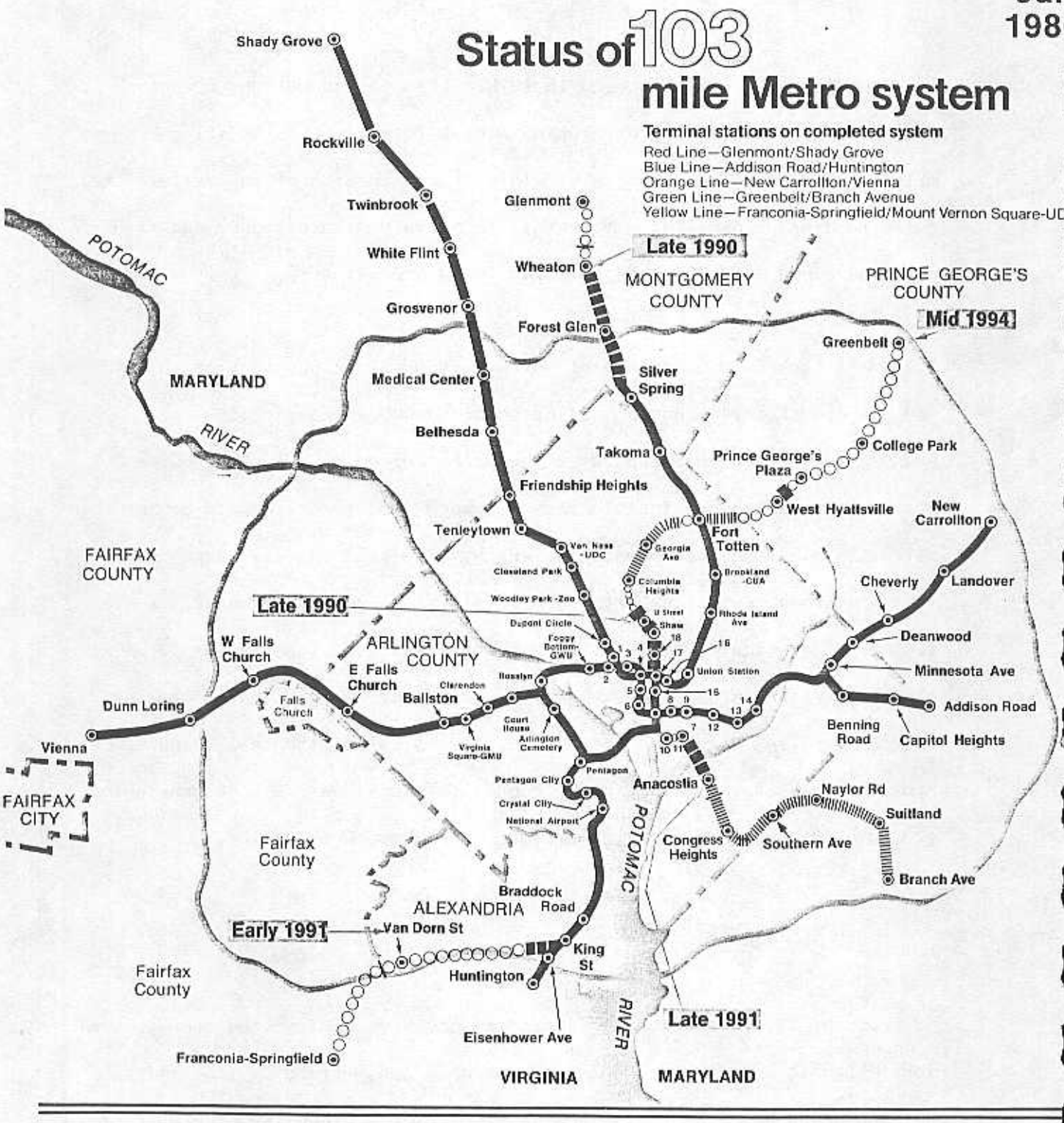
The Metrorail system opened in 1976. Figure 5 shows the current status of the system, now stretching almost 70 miles. An additional seven miles are planned for Northern Virginia (the extension of the Yellow Line to Franconia/Springfield). Metrorail fares vary with distance and time of day, and range from 80 cents to $2.40 for a one-way trip.

WMATA took over operation of Northern Virginia's bus service in 1973, and now operates 144 routes hauling about 90,000 weekday daily passengers. Figure 6 illustrates the areas served by Metrobus routes, which have been increasingly oriented toward feeder services to nearby Metrorail stations, as opposed to lengthy line-haul routes. Appendix A lists Metrobus routes in Northern Virginia and illustrates major transfer locations for each route (e.g. at Metrorail stations). Metrobus fares also vary with distance and time of day, ranging from 80 cents to $2.50 (for a trip from Virginia zone 3 to D.C.). A valid Metrorail transfer provides a 35-cent discount on Metrobus. Flashpasses are also available providing discounts for multiple rides over a two-week period.

B. LOCAL TRANSIT SERVICES

Four of NVTC's five member jurisdictions have implemented some form of local transit service to supplement Metrobus and Metrorail. The fifth, Falls Church, has asked for a design study of a minibus feeder service to two nearby Metrorail stations.

Figure 5



LEGEND

Operating Lines 60.57 miles 64 stations

Under Construction 9.60 miles 7 stations

Under Final Design 15.05 miles 9 stations

Remainder of System 8.75 miles 7 stations

1990 — Projected start of operations for this segment based on approved schedule. Applies to all stations inbound from this point.

Total mileage—102.97

Total Stations—87

1. Farragut North
2. Farragut West
3. McPherson Square
4. Metro Center
5. Federal Triangle
6. Smithsonian
7. L'Enfant Plaza
8. Federal Center SW
9. Capitol South
10. Waterfront
11. Navy Yard
12. Eastern Market
13. Potomac Ave
14. Stadium-Armory
15. Archives
16. Judiciary Square
17. Gallery Place
18. Mt Vernon Sq-UDC

M metro
Washington Metropolitan Area Transit Authority
600 Fifth Street, N.W., Washington, D.C. 20001
Office of Public Affairs

1. Alexandria

In March 1984 Alexandria began a 17-bus operation (known as DASH) over four routes using 30-foot Orion buses. In early 1986, the City acquired two additional 35-foot Orion buses. The City established the Alexandria Transit Company, which has a management contract with ATE Management and Service Company, Inc. The management company, in turn, set up a subsidiary to hire the drivers and operate the service. Fares are 90 cents one-way for rush-hour trips to or from the Pentagon, and 60 cents for other one-way trips. After paying the base fare, unlimited rides within the City are available within a three-hour period using a transfer. DASH also accepts transfers from Metrobuses and the Fairfax Connector.

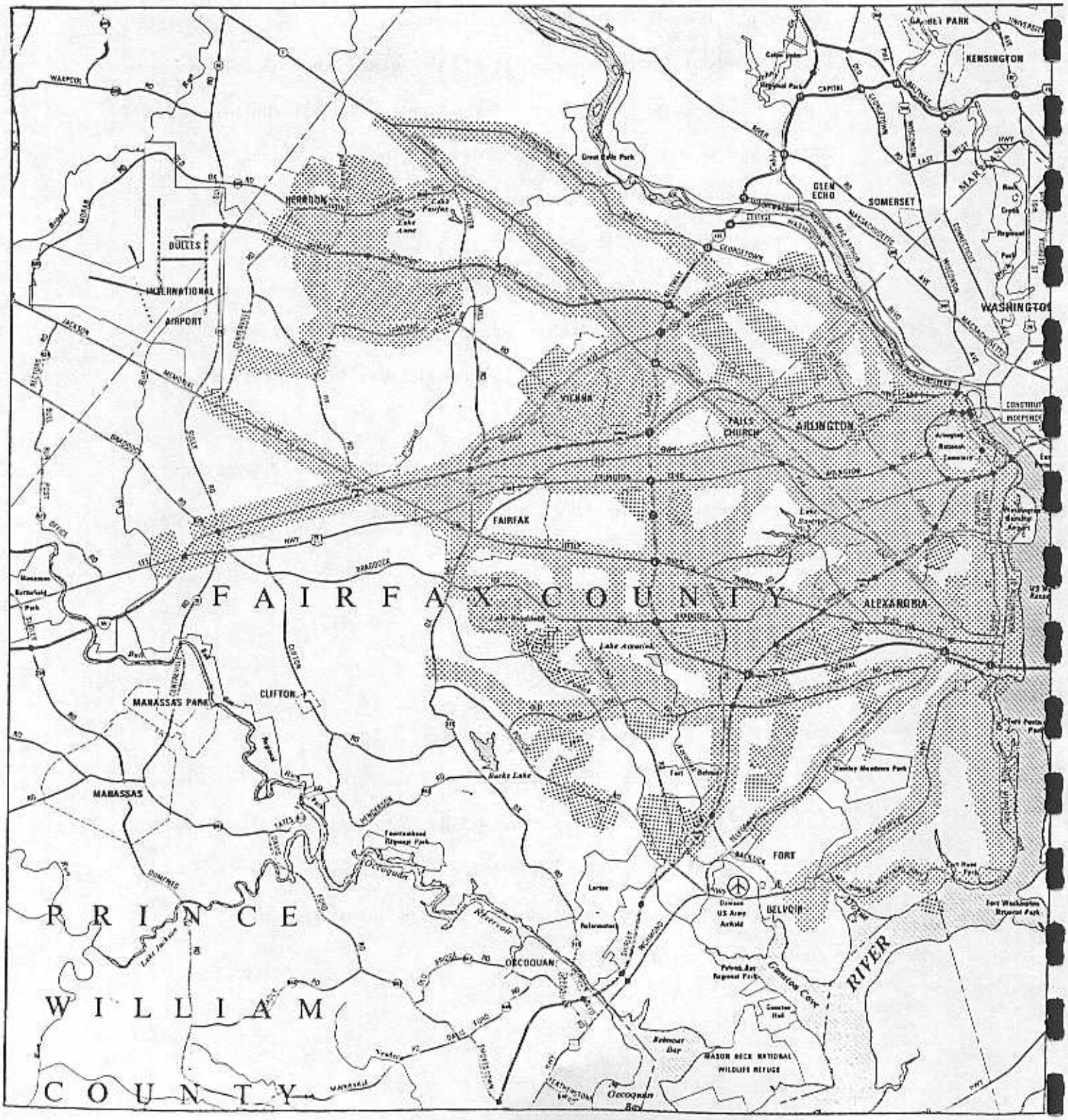
Alexandria is the site for NVTC's Subway Shuttle Taxi demonstration, which offers reduced-fare taxi service to and from Metrorail stations after 8:00 P.M. on weeknights.

2. Fairfax County

The County began service to the Huntington Metrorail station in September 1985, using 33 new 35-foot Orion buses. The County's service, known as the FAIRFAX CONNECTOR, is managed by National Transit Services, Inc. Fares are identical to those of Metro. The County's service replaced ten Metrobus routes serving the Huntington area, while five Metrobus routes were retained.

Figure 6

METROBUS SERVICE AREAS IN NORTHERN VIRGINIA



Fairfax County is also the site of NVTC's Tysons Shuttle demonstration, in which vans operate at 15-minute intervals during rush hours between the West Falls Church Metrorail station and the Westpark employment area near Tysons Corner.

3. Fairfax City

The City revised its CUE bus service in June 1986 to serve the newly opened Vienna Metrorail station and also expanded service to seven days a week (from five). Five new 30-foot Orions were purchased and placed in service together with three existing vehicles on three routes. The system is funded by the City with a set fee paid by George Mason University representing about 25% of the operating costs. Fares are 25 cents, with GMU students riding free, as do senior citizens and public school students. An express bus service previously funded by the City was discontinued. A private operator, Coleman Coaches, has now replaced some of the service to the District of Columbia, using two buses (whereas the previous operator used 11 buses over a more extensive route network).

4. Arlington

Although Arlington County relies on Metro for its public transit service, it has taken over from NVTC sponsorship of the Arlington Subway Shuttle Taxi. The SST operates along the path of Metrobus Route 22 to and from the Ballston Metrorail station during the late-night hours and on Saturday when the Metrobus is not in service. The special taxi will depart from its route to provide doorstep service at no extra charge. Fares are identical to those of Metro.

5. Other Local Services

In Fairfax County, the Reston Internal Bus System (RIBS) provides service within Reston. A total of three vehicles provide transportation to the citizens of Reston Monday through Saturday from 7 A.M. to 7 P.M. (No Sunday service is available.) The average fare is 35 cents at mid-day and 60 cents during rush hours. Reston Homeowners Association members ride for as little as 10 cents per trip. Transfers to and from Metrobus services are available. A valid RIBS transfer is worth 25 cents towards the regular Metrobus fare when presented to the Metrobus driver.

RIBS is supported through funding provided by Fairfax County, the Reston Homeowners Association and Reston Village Center Merchants. The service is operated under contract by MTS, Inc.

C. PUBLICLY AND PRIVATELY OPERATED COMMUTER BUS SYSTEMS

As shown above in Figure 4, commuter buses serve Fairfax City and several jurisdictions surrounding NVTC.

1. Fairfax City

Gold Line ceased operating commuter service to the District of Columbia under contract to Fairfax City on June 6, 1986. At that time it was carrying about 440 persons on 11 daily trips operating during rush

Figure 7

TAXI OPERATORS IN NORTHERN VIRGINIA

TAXIS

Alexandria		Vehicles
Alexandria Airport Cab Company		
All American		
Alexandria Diamond Cab Company		
Alexandria Yellow Cab Company		
City Cab		
Columbus Cab Corporation		
King Cab Company		
National Cab Company		
Silver Cab Company		
White Top Cab Company		
	Total	547
Arlington		
Arlington Yellow Cab Company		
Blue Top Cab		
Crown Cab		
Friendly Cab Company		
Hess Cab Company		
Red Top Cab		
	Total	530
Falls Church Yellow Cab	Total	155
Fairfax County (Including Fairfax City)		
Annandale Yellow Cab		
Bailey's Cross Roads Yellow Cab		
Belvoir Cab		
Fairfax Yellow Cab		
Falls Church Yellow Cab		
McLean Yellow Cab		
Springfield Yellow Cab		
Vienna Yellow Cab		
	Total	277

hours five days a week. The City believed that the newly opened Metrorail system and its expanded CUE bus system would provide adequate service. Since then Coleman Coach (a private operator) has begun picking up passengers. An application has been submitted to the Washington Metropolitan Area Transit Authority (WMATC) for authority to operate to and from the District of Columbia. Presently Coleman Coach is operating on an "allegation of immediate and urgent need " until the application comes before the Commission.

2. Prince William County

The County recently signed a contract with Bus Lease Contract Services, Inc. to manage an extensive commuter bus system. The full service contract stipulates that Bus Lease Services provide the management expertise, employees, and three reserve buses. Prince William County must provide the remaining twenty buses and the facilities to garage the buses. The three year contract will expire in May of 1989. The County has the option to continue the contract for two years thereafter.

3. Stafford County, Spotsylvania County, and the City of Fredericksburg

Several commuter bus systems provide service for the above Northern Virginia jurisdictions. D & J and Virginia Motor Coach, the two largest operators, average 240 and 600 passengers a day, respectively, with ridership continuing to increase.

Figure 8

AIRPORT GROUND TRANSPORTATION

PROVIDED BY THE WASHINGTON FLYER

Firm	Vehicle Type	Number of Vehicles
The Airport Connection, Inc.	Intercity Coaches	14
	Small Buses	6
	Vans	45
Dafre, Inc.	Intercity Motor Coaches	6
Air Transit, Inc.	Taxis	135

4. Loudoun County

Sterling Commuter Bus provides commuter bus service for the Sterling, Sterling Park, and Sugarland areas. The commuter bus travels to downtown D.C., the Pentagon, and Rosslyn daily with passengers averaging 100 per day.

D. PRIVATE TAXI SYSTEMS

Northern Virginia taxi firms are regulated by the local jurisdictions, which are responsible for setting fares, licensing and monitoring the industry. Figure 7 lists taxi firms and vehicles by jurisdiction. The two largest owners control about 60 percent of the region's taxis.

NVTC has contracted with several firms in Alexandria to operate the Subway Shuttle Taxi, and with one firm in Arlington to provide SST service in that jurisdiction. An Alexandria taxi firm provides service on request to Tysons Shuttle patrons using a wheelchair-equipped van.

E. AIRPORT SERVICES

The Federal Aviation Administration has contracted with The Airport Connection, Inc. to provide ground transportation service to Dulles and National Airports using intercity coaches, small buses, and vans. FAA has a contract with Air Transit, Inc. to operate a fleet of taxis at Dulles International Airport. Taxis and buses all share a logo ("Washington Flyer") and color scheme (gray and white). NVTC helped to design and implement the initial marketing campaign for Washington Flyer service.

Figure 9

NORTHERN VIRGINIA PUBLIC PARK-AND-RIDE LOTS

ID #	Name	Spaces
1	Dumfries Road	97
2	Dunn Loring Metrorail	1000
3	East Falls Church Metrorail	300
4	Fair Oaks Shopping Center *	150
5	Fairfax City Fringe Lot	45
6	Fairfax City Municipal Lot	105
7	Hechingers	240
8	Horner Road	375
9	Huntington Metrorail	2260
10	Lake Ridge	168
11	Minnieville Road	555
12	NVCC	225
13	Reston	165
14	Rolling Valley	340
15	Route 123	150
16	Shirley Plaza	200
17	Springfield Cinema	100
18	Springfield Mall	400
19	Springfield Plaza	105
20	Springfield Methodist	75
21	Vienna Metrorail	2000
22	Vienna Theatre	110
23	Virginia Power (Arlington)	30
24	West Falls Church Metrorail	1000
25	Ballston Park 'N Ride	500

* Carpools only

--- Metrorail line

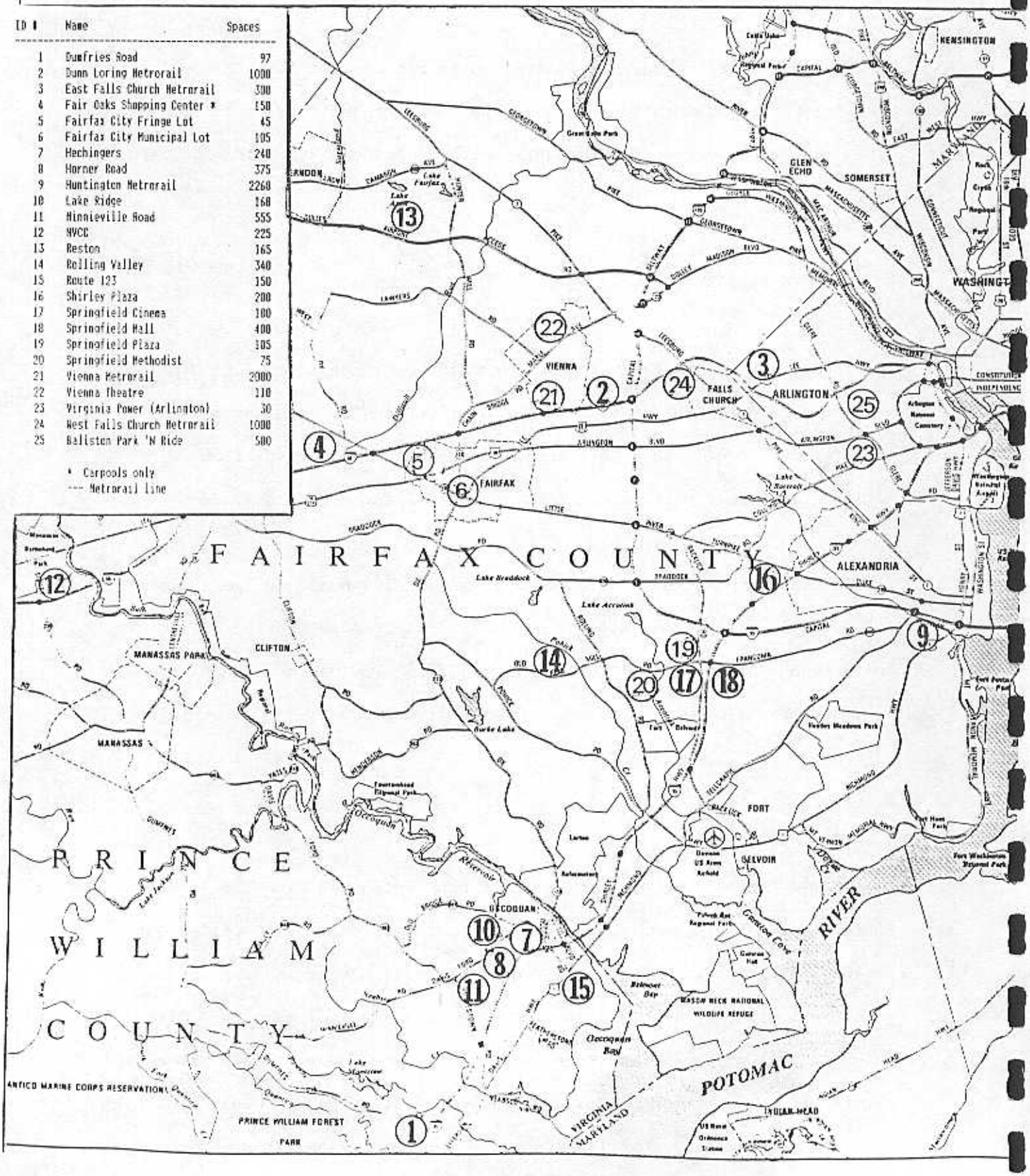


Figure 8 lists the equipment operated under contract to FAA.

F. VANPOOLS AND RIDESHARING SERVICES

Vanpooling continues to grow in Northern Virginia as some commuters living more than 20 miles from their workplaces find this mode to be cost-effective and convenient. The Metropolitan Washington Council of Governments (COG) traffic counts between 1983 and 1985 recorded a 25 percent growth in vanpools from 690 vehicles to 860 vehicles entering the Washington core employment area between 6:30 A.M. and 9:30 A.M. Most vans are owned by individuals who operate and maintain the vehicle, recruit riders, and collect fares. Vans may also be leased from a private contractor such as Vanpool Services, Inc. (a subsidiary of the Chrysler Corporation with offices nationwide and in Washington, D.C.)

The Virginia Department of Highways and Transportation has a contract with Vanpool Services, Inc. to discount the monthly lease costs to Virginia residents. In exchange, VDH&T promotes the services of the firm. This program is known as the Virginia VANPLAN and it allows commuters to reduce the effort required to operate a vanpool. The VANPLAN offers a full service lease and provides recruiting assistance to the vanpool when it needs additional members.

COG heads a regional network of ridesharing programs that in FY 1985 processed 24,500 applications for commuting assistance.

Figure 10

HIGH-OCCUPANCY-VEHICLE FACILITIES

Facility	Minimum Occupancy Requirement	Restricted Hours A.M.	Restricted Hours P.M.
I-395	4 persons	6 A.M.- 9 A.M.	3:30 P.M. - 6 P.M.
I-66	3 persons	6:30 A.M. - 9 A.M.	4 P.M. - 6:30 P.M.
I-95 Extension (inside lane)	4 persons	6 A.M. - 9 A.M.	3:30 P.M. - 6 P.M.
Alexandria (Washington St outside lane)	3 persons	7 A.M. - 9 A.M.	4 P.M. - 6 P.M.

G. PARK-AND-RIDE LOTS

All day parking is available at only five Metrorail stations in Northern Virginia (Huntington, Vienna, Dunn Loring, East and West Falls Church). Those lots are either at capacity or very close to it. Figure 9 shows the locations of other park-and-ride facilities in the area, many of which are served by bus (those which are not serve as carpool staging areas).

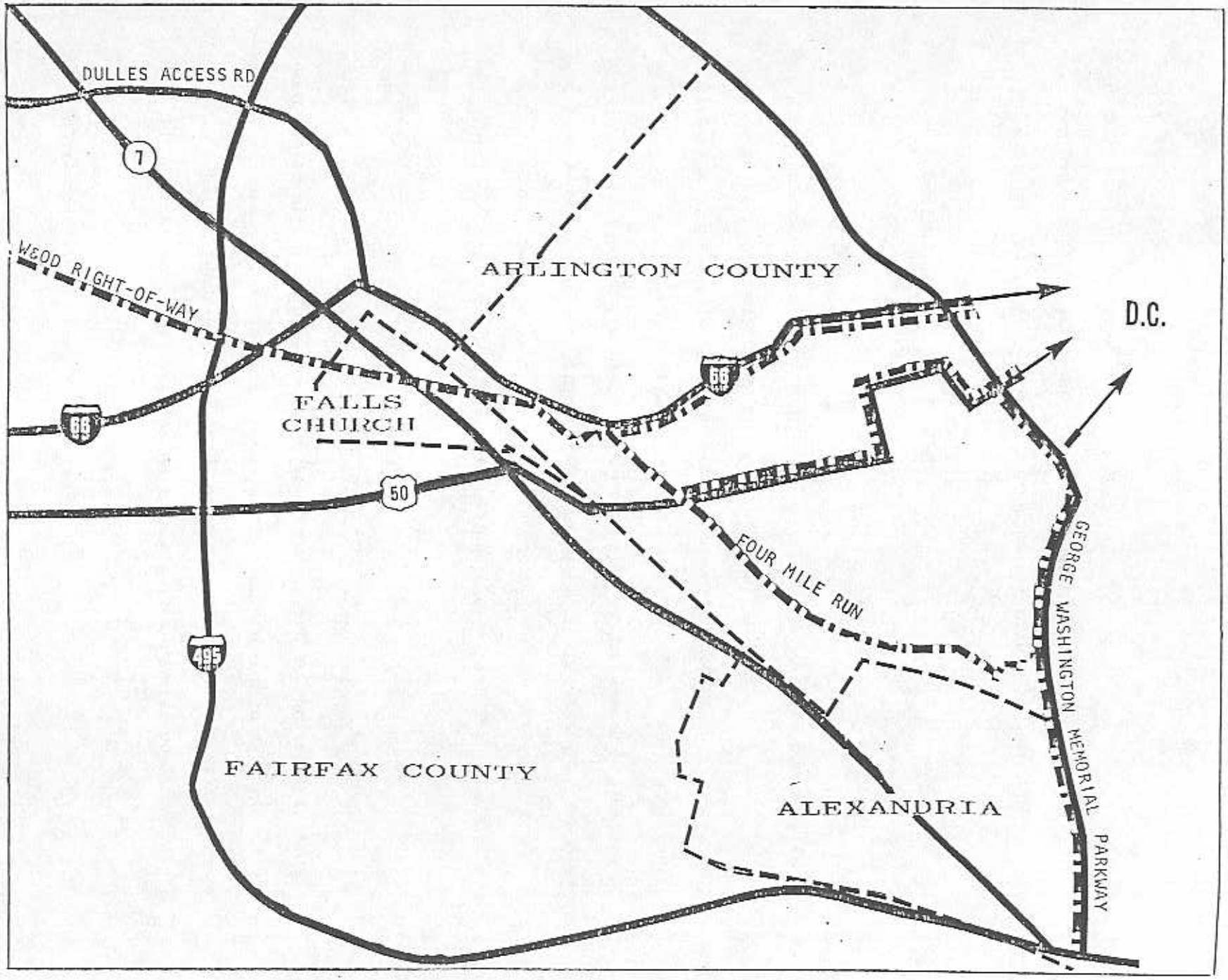
Several new park-and-ride sites are being investigated. For example, a Federal grant has been awarded to Fairfax County to explore locations near the future Springfield/Franconia Metrorail station. Fairfax City has an interest in lots that could be served by its CUE bus system. Virginia Governor Gerald Baliles has offered the Commonwealth's help in expediting construction of such lots. In addition, a commuter parking facility at Dulles Airport to serve Loudoun and Fairfax County residents is under active planning. NVTC is exploring means to provide commuter bus service when the lot is opened.

H. HIGH-OCCUPANCY VEHICLE FACILITIES

To expedite the flow of traffic in Northern Virginia, several high-occupancy vehicle lanes have been designated on expressways and arterials. A list is given in Figure 10.

Figure 11

NORTHERN VIRGINIA'S BIKEWAYS NETWORK



I. BIKEWAYS

Northern Virginia's bikeways are largely used for recreational purposes, but the network is expanding and may have potential for increased use by commuters. Figure 11 illustrates the region's network of bikeways.

J. ELDERLY/HANDICAPPED SERVICES

1. Metro's On-Call

Metro's On-Call service operates 225 lift-equipped buses that are available to serve all bus routes. There are nine routes that lift-equipped buses serve regularly. For all other Metrobus routes, a 24-hour reservation is required. There is no additional fee to use the On-Call Service, and in fact, the fare is reduced to approximately half of the regular fare. The only requirement to use the service is that there is a need.

2. FASTRANS

FASTRANS, a transportation service of the Fairfax County Government, operates 52 vehicles that provide transportation for the elderly and handicapped of Fairfax County. In some instances, residents of Fairfax City and Falls Church are also eligible to use the service. The Fairfax County Office of Human Services acts as a broker for four human servce agencies to provide transportation for the elderly, the disabled, and

persons of limited income. Reservations for transportation are placed 24 hours in advance. If necessary, the driver can provide the rider with assistance in and out of the vehicle and can also assist with packages. FASTRANS is funded by Fairfax County and operated by Transportation in Public Service, a non-profit corporation.

3. DOT

DOT is a specialized public transportation service that operates within the City of Alexandria for persons who cannot use regular transit buses because of disabilities. Taxicabs and four wheelchair-accessible vans are available for DOT service. Any person living in or visiting the City of Alexandria who has a disability which prevents him or her from using a regular transit bus and who is certified eligible for DOT transportation may use the service. Patrons pay $1.25 per person per one-way trip. The hours of operation are Monday-Friday from 6 A.M. to 11:30 P.M., Saturday from 6:30 A.M. to 11:45 P.M., and Sunday from 8 A.M. to 9:30 P.M. Reservations for weekday trips are placed before 3 P.M. the previous day. Reservations for Saturday, Sunday, and Monday are placed by 3 P.M. on the Friday before the scheduled trip. The driver cannot assist the rider to and from the vehicle. If assistance is needed, a companion is required to accompany the rider.

DOT transportation is provided through a coordinated effort by the City of Alexandria's Office of Transit Services, Senior Citizens Employment and Services, and Diamond Transportation Cab Company.

4. Fare Wheels

The Northern Virginia Planning District Commission (NVPDC) began a demonstration in 1984 using Federal funds for a user-side subsidy program for elderly and handicapped transportation. Clients are provided scrip which is accepted by participating taxi and other transportation providers. Consequently, a large number of taxicabs, lift-equipped vans and other special vehicles are available to provide service for the elderly and disabled of Arlington, Falls Church, and the City of Fairfax. The agencies which currently participate in the service include the Arlington Community Services Board, the Falls Church Department of Housing and Human Services, and the Madison Center. To be eligible for the service, a person must be a client of one of the above participating human service agencies and must be unable to use conventional transit. In Fairfax City, members of the general public who are unable to use CUE are eligible for Farewheels. As in the case of FASTRANS and DOT, a 24-hour reservation is sometimes needed to secure a space on specialized vehicles, although taxi service is available on demand.

III. PATTERNS OF USE AND IDENTIFICATION OF PROBLEMS

Public transit carriers now capture about a fifth of all commuting trips to the core areas of the Pentagon, Crystal City, Rosslyn, and the District of Columbia, but transit use varies by jurisdiction and circumstance. Although transit shares are often relatively small, these systems clearly provide an essential service in helping to clear congestion that otherwise would be insurmountable, especially during peak commuting hours. As it is, commuting trips are forecast to soar, but jobs and populations will become more dispersed. Traditional forms of transit will be hard pressed to provide effective competition to the personal automobile in these dispersed areas.

In this section, data illustrating patterns of use of transit versus other modes are discussed. Problems of mobility are identified and classified according to four themes: 1) Connections, 2) Information, 3) Performance, and 4) Financing.

A. TRAVEL PATTERNS AND MODE SHARES

Because Northern Virginia's transportation network links people with their jobs, homes, shopping, and recreation throughout the region, it is not productive to look narrowly at one jurisdiction, one mode, or even one point in time, in order to define transportation problems and examine solutions. And, providing effective options for personal mobility is an especially expensive and complex proposition here, since the volume of trips to be served is enormous and most people want to travel at the same

Figure 12

MODE SHARES FOR WORK TRIPS OF

RESIDENTS BY JURISDICTION

--Percent--

	Transit	Auto	Carpool*	Other
OUTBOUND BY RESIDENT				
Alexandria	24.0	51.0	22.3	2.0
Arlington	30.0	44.3	22.6	3.0
Fairfax County	12.0	54.7	31.9	1.0
Fairfax City	9.0	66.2	23.0	2.0
Falls Church	15.6	55.1	27.6	1.6
INTERNAL BY RESIDENT				
Alexandria	10.5	55.7	15.3	10.4
Arlington	12.0	45.0	16.9	26.0
Fairfax County	2.0	71.4	15.6	11.0
Fairfax City	2.0	69.8	12.5	16.0
Falls Church	5.0	60.3	6.9	28.0
INBOUND BY NON-RESIDENT				
Alexandria	6.0	67.6	24.4	2.0
Arlington	16.0	51.2	31.9	1.0
Fairfax County	3.3	68.5	26.8	1.5
Fairfax City	2.0	77.1	18.0	3.0
Falls Church	5.5	71.6	18.4	4.5

* Carpool is defined as any automobile with 2 or more passengers.

Source: 1980 Census.

times each day, creating crush loads on our highways and burdening our transit systems.

How successful have the region's transit operators been in capturing market share from other modes, particularly the personal automobile? Sources of information on this subject include the 1980 Census, annual ridership surveys by Metro and other transit operators, and traffic counts at cordon lines conducted by the Metropolitan Washington Council of Governments (COG).

Appendix B provides detailed information about transit travel patterns for each NVTC jurisdiction, derived from the 1980 Census. NVTC conducted an analysis with COG of Census work trip data showing flows between analysis units known as traffic zones. The analysis indicated that transit shares are substantially larger for trips by Northern Virginia residents to jobs outside their jurisdiction of residence, compared to trips within these jurisdictions or trips to the jurisdictions by persons living outside the area. As shown in Figure 12, for commuting trips outside Alexandria by the City's residents, transit captured a 24 percent share in 1980, prior to the opening of Metrorail's Yellow Line. For internal work trips, only 10.5 percent of residents used transit. For workers coming into Alexandria from elsewhere to work, transit's share was only 6 percent. Similar patterns appear for the other Northern Virginia jurisdictions.

Since 1980, the region has experienced a dispersion of jobs and population that is forecast to continue. According to the updated version of the Council of Governments' Round III Cooperative Forecasts, the core (D.C. Arlington and Alexandria) population and employment will grow by two percent and fifteen percent, respectively, between 1985 and the year 2000. In the ring of inner suburbs (Montgomery, Prince George's and Fairfax Counties) population and employment will grow by 15 and 34 percent, while in the outer ring (Loudoun and Prince William Counties) growth will be 54 and 68 percent. Looking to the year 2000, COG foresees a one-third increase in the commuting trips throughout the Washington area, climbing to over 3 million daily trips from 2.3 million today. Nearly half of the trips will be confined to so-called "cross-county" travel (beginning and ending in one jurisdiction). Consequently, those commuting markets in which transit has traditionally captured the smallest shares are experiencing the most growth.

Council of Governments' estimates also suggest that auto ownership will expand rapidly in the Metropolitan region, reaching almost 2.4 million autos by the year 2000, compared to about 1.5 million in 1980 and 2.0 million in 1990. By 1990 there will be more families with three cars than with no cars.

This does not mean that Metro's radial routes carrying large volumes of commuters to core work locations will be poorly utilized. In fact, if Metrorail did not exist to serve the 200,000 daily transit trips it now provides in Northern Virginia, NVTC's conservative estimates are that five

Figure 13

DAILY NORTHERN VIRGINIA LOCAL TRANSIT TRIPS BY SYSTEM
DURING FY 1986

	WEEKDAY	WEEKEND
Metrorail	114,000	N.A.
Metrobus	90,000	*
Alexandria Dash	4,599	1,906
Fairfax City Cue	745	**
Fairfax County Connector	3,350	1,150
Reston Ribs	220	85

* Saturday (27,000) & Sunday (13,000)
** Did not operate on weekends during FY 1986 except after June 6, 1986. After that date, service was provided to the Vienna Metrorail station.

Sources: 1986 Metrobus Survey
Ridership Surveys By Local Operators
From 1985 Metrorail Survey: 411,644 average weekday ridership for system: 27.71% Virginia
WMATA/Planning

additional freeway lanes would be required, costing perhaps $360 million to construct. Six extra bridge lanes would be needed over the Potomac River. Perhaps $230 million in additional parking spaces would be required. The cost of commuting would soar.

According to the Virginia Department of Highways and Transportation, the most heavily travelled section of highway in Virginia is the Shirley Highway between the 14th Street Bridge and the Route 1 exit to Crystal City. About 154,000 vehicles use the facility on an average day. At an average occupancy of 1.3 persons per vehicle, the 200,000 plus trips served by Metro in Northern Virginia are, therefore, equivalent to all the traffic on the Shirley Highway using that most heavily travelled segment. Metro has the further benefit of capturing these potential automobile drivers during the most heavily congested peak hours.

Figure 13 shows details of Metro and local bus ridership derived from recent surveys. As can be seen, Metrobus provides about 90,000 daily transit trips in Northern Virginia, and combined with Metrorail and local bus systems, 210,000 transit trips are served each day. Ridership on the four new Metrorail stations in Northern Virginia has been heavier than forecast. After a month, the 28,000 daily trips served at these four stations exceeded six month forecasts. Heavy off-peak ridership was especially gratifying. Approximately 62 percent of off-peak riders previously used their automobiles, while 48 percent of peak riders formerly travelled by auto.

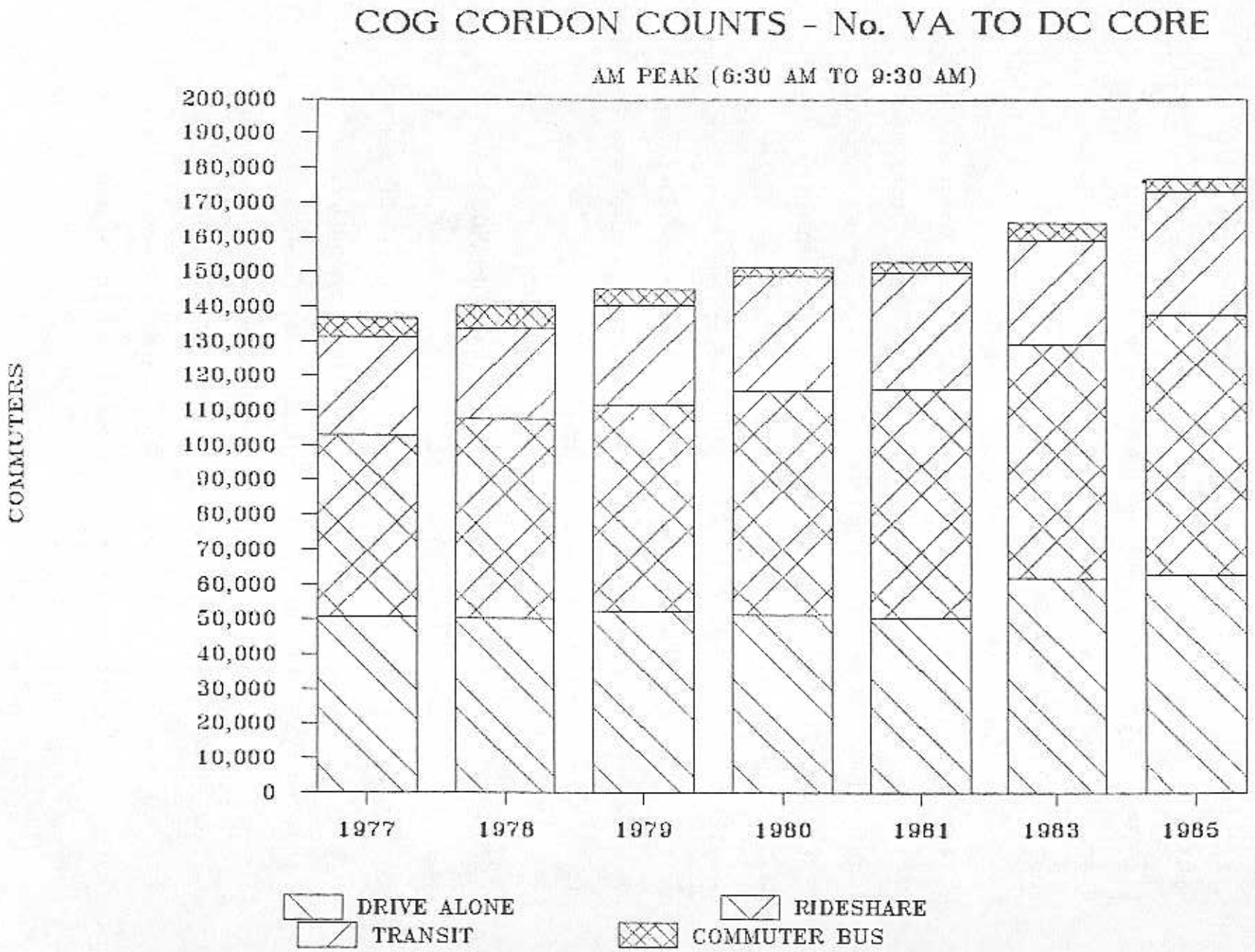

COG CORDON COUNTS - No. VA TO DC CORE
AM PEAK (6:30 AM TO 9:30 AM)
COMMUTERS
200,000
190,000
180,000
170,000
160,000
150,000
140,000
130,000
120,000
110,000
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1977
1978
1979
1980
1981
1983
1985
DRIVE ALONE
RIDESHARE
TRANSIT
COMMUTER BUS

Figure 14

Traffic counts are taken by the Council of Governments at cordon lines (predetermined measurement locations) on major arterials leading toward the District of Columbia, Rosslyn, the Pentagon, and Crystal City. The most recent figures available (1985) show that transit served about a fifth of all Northern Virginia commuter trips to the core. Cars with more than one occupant added another two-fifths, with single occupant autos comprising the remainder. Figure 14 shows COG cordon count results since 1977. Transit's share has held relatively constant at about 20 percent.

B. PROBLEMS

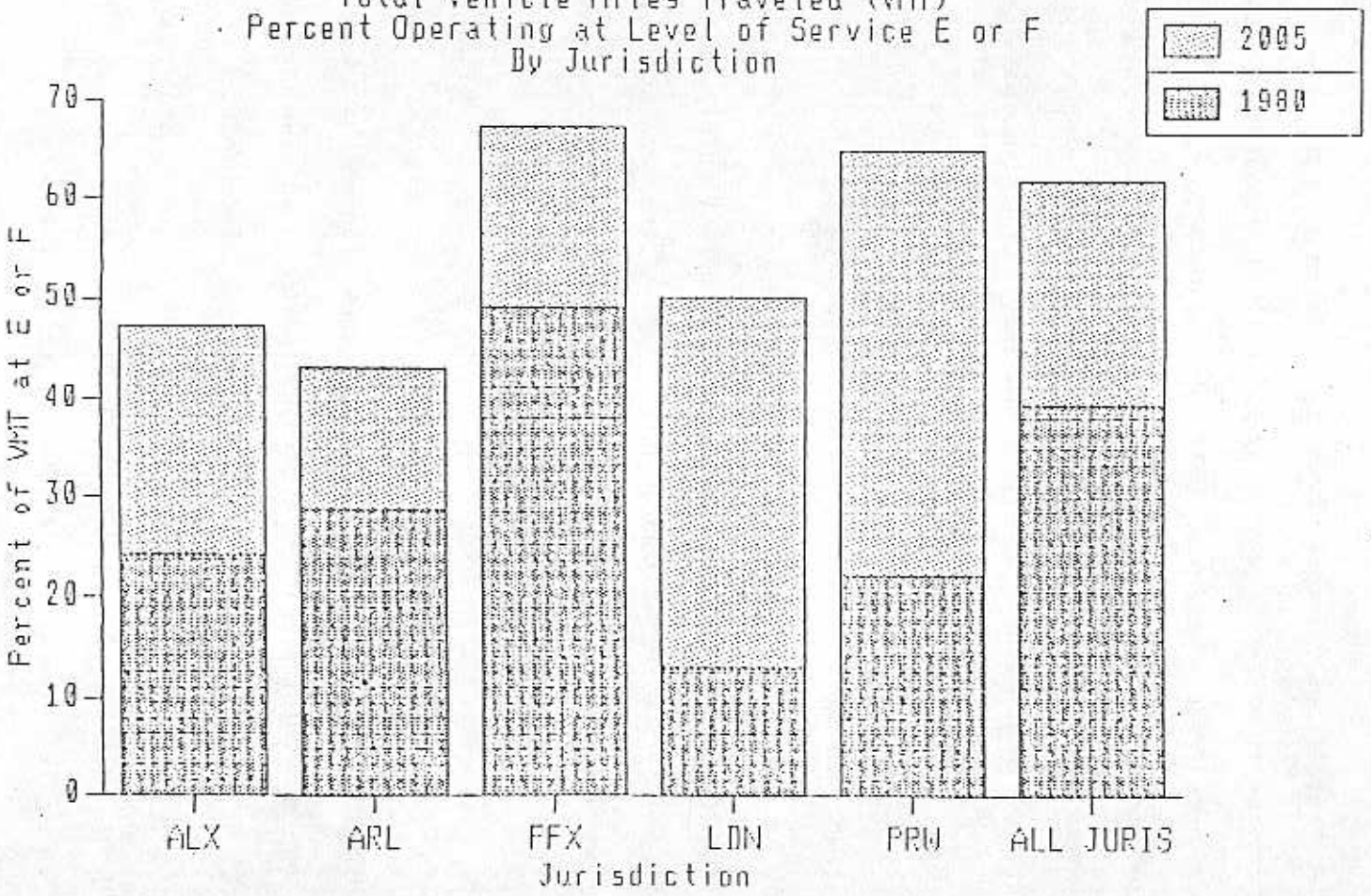
Without effective public transit, Northern Virginia's streets and highways would be hopelessly clogged. Without an adequate network of roads, mass transit vehicles could not provide effective service. Consequently, transportation problems are not confined to one mode. Commuters must be given informed choices. The following are problems identified in the course of NVTC's Bus Service Coordination Plan for which the Commission has undertaken solutions.

1. Connections

Transportation in heavily congested Northern Virginia of necessity is like a relay race rather than a sprint, and if one segment of the transportation system drops the baton, the contest is lost.

a. Congestion

Public opinion surveys consistently rank transportation congestion as the region's worst problem. According to VDH&T, Fairfax County ranked first in Virginia with 8.8 million average daily vehicle miles traveled in 1985, an increase of 600,000 miles over 1984. The second ranking county (Henrico) tallied "only" 2.4 million ADT. For 1985, Northern Virginia's Beltway (I-495) had ADT of 130,705 per mile. Interstate 66 carried 34,993 vehicles per day per mile.



Source: Metropolitan Washington Council of Governments
Transportation Planning Board

Figure 15

Highway engineers measure service quality according to various "levels of service" from A (smoothly flowing) to F (stop and go) traffic. A recent forecast by COG predicts that by the year 2005, almost 70 percent of peak vehicle miles traveled in Fairfax County will be at level of service E or F, compared to 50 percent in 1980.[1] Figure 15 shows these comparisons for all Northern Virginia jurisdictions.

According to the COG study, in 1980, 17.4 percent of all Northern Virginia freeways and arterials operated at unacceptable levels of service E or F during peak travel hours (i.e. 7-9 A.M. and 4-6 P.M.). By 2005, 31.5 percent will be at those levels.[2]

Congestion affects the ability of transit vehicles to offer fast, reliable, and safe trips. For example, Metrobuses required to use the newly opened Dulles Toll Road experienced delays at entrance ramps and toll booths that drew protests from riders (before the Toll Road opened in 1985 these buses had used the uncongested Dulles Access Highway). Washington Flyer buses serving Dulles Airport frequently detour off congested I-66 through Falls Church. Some Metrobuses were rerouted off I-66 to use Wilson Boulevard in Arlington to reach Rosslyn.

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1 "Northern Virginia's Transportation: A Summary of Travel Conditions Past, Present and Future," George Wickstram, MWCOG (June 1986) at 4.

2 Id. at 2.

b. Access to Metrorail Stations

While congestion in general affects all travelers' ability to move freely, crowding near Metrorail stations is especially bothersome for potential transit users. Metro has restricted parking at many Metrorail stations in response to concerns of neighbors who object to the traffic such stations generate. Also, parking fees at many Metro stations are set below market rates. Consequently, lots fill quickly, and restricted parking programs have been established on nearby streets as a result of protests by residents.

At West Falls Church, Fairfax County planners forecast that 75 percent of the intersections surrounding the Metro station will be subject to significant rush-hour delays, assuming completion of planned road improvements and no new development. But improvements to Haycock Road, for example, will not be completed for several years. Also, the sidewalks to accompany the improvement are not available, and pedestrians have complained since 1984 (when NVTC's 66-X express Metrobus began operations from the West Falls Church Metrorail station parking lot) about unsafe conditions.

County planners foresee severe rush-hour congestion at 36 percent of the intersections near the Dunn Loring Metrorail station and 20 percent near Vienna. On the other hand, no severe congestion has been noted around Arlington Stations, some of which have been open for several years.

c. Changing Travel Patterns

Transit routes have been established to serve high density radial trips connecting Northern Virginia residents with their jobs in the core (Pentagon, Rosslyn, Crystal City, District of Columbia). As more Metrorail stations have opened in Northern Virginia, line-haul Metrobus routes have been reoriented to feed these stations.

Increasingly, however, Northern Virginia's residents are working and shopping in other Northern Virginia locations, necessitating non-radial connections. These new work sites are more dispersed, and less amenable to high volume transit service. These trends are expected to continue.

d. Expensive and Time Consuming Transit Trips

As mentioned, most Metrobus routes in Northern Virginia have been cut back to feed commuters to and from Metrorail stations. Many passengers who formerly traveled by bus to their worksites have been forced to absorb significant increases in fares and travel time as they now must transfer between buses and Metrorail. On the other hand, some former bus riders experienced lower fares with the opening of Metrorail for their new bus/rail trips, while others chose to walk or drive directly to the new rail stations, thereby reducing travel times.

To reduce the impact of Metrorail's distance-based fare on long distance riders, the Metro Board has capped one-way rail fares at $2.40. However, many passengers face bus fares of more than one zone to reach the

nearest Metrorail station, adding perhaps $1.10 to a one-way trip. For example, a round-trip bus-rail fare from Burke Center to Metro Center via the Pentagon would cost $4.65 and require about two hours of travel, transfer, and waiting time.

Some trips are very difficult to make by transit, even if both ends are located on or near a Metrorail line. For example, to go from the Arlington Court House to the Alexandria City Hall requires a trip by Orange Line, transferring to the Blue Line at Rosslyn, transferring to the Yellow Line at National Airport, with a connecting one-mile, one-way walk, taxi, Metrobus, or DASH ride from the King Street Station. Alternatively, Metrobus connections are available from the Blue Line at National Airport or Crystal City. This one-way trip of four airline miles requires a round-about route and about an hour travel time by transit. Even with traffic congestion and expensive parking, the transit option in such a case is not inviting to a traveller with other choices available.

e. Unserved Transit Markets

The tremendous growth occurring in western Fairfax County may be creating demand for transit services that is currently unmet. Recent extensions of bus services to Lorton and Centreville illustrate the new markets that are developing for feeder bus services. One approach to determine the extent of this potential demand is to conduct market research in newly developed areas. NVTC's 1986 household survey project in Centreville produced a very accurate estimate of the number of bus

riders on the new 12C route. Market research is considerably less expensive than experimental bus service as a means to determine potential ridership.

Other considerations for developing services that compete with the private automobile are ridesharing activities and subscription bus services. Carpool and vanpool promotion and formation may result in better commuting opportunities for many residents and these modes do not require ongoing public subsidies. Shared-ride activity in a community may also lay the foundation for bus service once a sufficient level of activity is achieved. Still, more traditional transit may be needed to serve occasional commuters and persons who travel outside the rush hours.

f. Lack of Cooperation Among Transit Providers

Schedules and routes of Metro and local bus systems are not necessarily set to facilitate connections of passengers and schedules do not all show connecting routes operated by other transit systems. Although sharing of some facilities and equipment (e.g. bus garages or specialized maintenance procedures) might yield mutual savings in an ideal world, in reality the current institutional differences (e.g. union versus non-union employees) between Metro and the local transit systems seem too great to permit such cooperation at this time.

2. Information

Even with limited public transit service, a well-informed and experienced transit user can often learn how to use transit to its

greatest advantage. Unfortunately, problems in providing timely and accurate information can discourage even the most sophisticated potential users.

Transit can have the image of a difficult (or even tortuous) ordeal requiring lengthy waits, surly drivers, complicated transfers, expensive fares, and erratic service. Even at its best, Northern Virginia's public transit network is often perceived as suffering from one or more of these traits. These perceptions may be worsened by the lack of unified telephone information numbers, poor signs, and an absence of coordinated marketing.

a. No Central Telephone Information Number

Metro maintains its own computerized telephone information facility, known as ARTS. Callers receive accurate information on Metro's fares, schedules, and routes, although the volume of calls causes some callers to receive busy signals or be placed on hold for several minutes. However, local bus systems (DASH, Connector, CUE) each have separate telephone information numbers at which callers' questions are responded to manually (e.g. by looking in a printed schedule).

The most significant difficulty a potential transit user faces is not knowing which number to telephone for a particular trip, or not being informed accurately of how to best make connections using one bus system to access another bus system. Although Metro operators are instructed to inform patrons that the local jurisdictions operate bus services that may

provide the desired trip, the Metro operators are not highly familiar with the local systems and may not provide the best information possible. For example, Metro operators would not inform an Alexandria resident traveling from Alexandria Avenue and Braddock Road to Farragut West that DASH would take him directly to the Pentagon where he could take the Blue Line to Farragut West. Instead the operator would suggest that he take Metrobus 28A to King Street metrorail station, take the Yellow Line to National Airport and transfer to the Blue Line to Farragut West. Similarly, Metro operators would not inform the same potential rider the trip via DASH and Metrorail would cost $1.75 compared to $2.35 by Metro alone.

b. Lack of Convenient Fare and Schedule Outlets

Scores of businesses, libraries, and government offices stock Metro and local transit schedules in Northern Virginia. In NVTC's first Bus Service Coordination Report, Appendix II listed 64 outlets in Alexandria, 57 in Arlington and 57 in Fairfax County, together with 58 fare outlets in NVTC's five member jurisdictions (at which bus passes and tickets are sold). Nonetheless, potential riders have complained about lack of easy access, and some businesses argued that administrative costs of handling such transactions were burdensome. For example, several financial institutions discontinued sales of Metro fare media during 1985 and early 1986.

c. Inadequate Signs In and Near Transit Stations

Driving to and traveling on the Metrorail system can be a confusing experience for some riders. Visitors and residents often must learn by doing, since Metro policy has kept signs to a minimum in an effort to preserve the architectural purity of the Metrorail system. Signs are especially important for occasional Metro users, such as tourists, at such sites as National Airport.

d. Lack of Coordinated Marketing

Metro has a $5.5 million marketing budget, and a department staffed by professionals. Northern Virginia's several local transit systems also undertake marketing, but on a much smaller scale. However, decisions on marketing often have been made in total isolation. No agency, except to the extent possible NVTC, has attempted to market public transit as a unified regional system.

e. Misunderstanding of Relative Costs of Auto Versus Transit

Even if transit systems possessed a coordinated information service that dispensed accurate data to potential riders on the costs of traveling by bus or Metrorail, no such service has existed for automobile users. It is well-known that auto users tend to discount "hidden" costs of auto use (e.g. insurance and taxes) in deciding whether it is economical to use a car for a particular trip.

Thus, transit can be at a double disadvantage:

1. Transit is sometimes more costly than the full costs of travel by automobile; and
2. When transit is less costly, auto drivers may incorrectly perceive car use to be cheaper.

3. Performance

Getting from here to there and back again is regarded by most Northern Virginia residents as the region's most important problem. Travel times, especially at rush hours, are lengthening as more commuters jam our roads. There is no relief in sight, except for those who have convenient access to Metrorail.

As mentioned above, George Wickstrom of COG foresees serious congestion in this region[1]. By the year 2005, almost 70 percent of peak vehicle miles travelled in Fairfax and Prince William Counties will be at Level of Service E and F (very poor driving conditions). Using an index of congestion, by 2005 Prince William County will surpass Fairfax County as the most congested jurisdiction, as population and jobs continue to move further from the core. The deterioration in service will increase freeway travel time by two minutes per mile for each level of service reduced. (e.g. E to F) Thus, a 30-mile trip could take a full-hour longer.

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1 "Northern Virginia's Transportation. A Summary of Travel Conditions Past, Present and Future." George Wickstrom, COG (June 1986).

A recent Conference Board survey of 5,000 U.S. households revealed that only 17 percent believed local transportation was efficiently managed, and commuter railroads received a favorable rating from only 12 percent. Only trade unions, the Pentagon, and Congress received lower rankings.[1]

a. Lack of Integrated Service

Public transit services remain separate and distinct entities. Vehicles or maintenance facilities are not shared. Metro itself has not reached out to embrace mutual cooperation with bus systems and taxi companies it regards as competitors.

b. Relatively High Metro Costs Relative to Revenues

WMATA's bus operations in Northern Virginia recover on average less than one-third of operating costs from the farebox. Metrorail recovers about two-thirds of its costs. Metro construction, although largely financed by Federal funds to date, has experienced escalating costs due to construction delays. Metro has a full-funding agreement with UMTA to complete approximately 90 miles of the 103 mile system.

While Metro's combined operating cost recovery ratio of just over 50 percent is relatively strong compared to transit systems in other parts of the country, local governments have found that they can operate bus

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[2] Urban Transport News (July 17, 1986) at 113.

service of similar or superior quality on certain local routes for substantially less, due largely to the use of non-union labor. Local governments also cite a greater responsiveness to local conditions as one of the primary benefits of shifting from Metrobus to local service.

Metro signed an agreement with its largest union local (#689 of the Amalgamated Transportation Union) in the Spring of 1986. While some productivity gains were apparently realized, it did not include a provision sought by some Board members that would have provided a two-tier wage scale. Such reduced wages for newly hired employees on new suburban routes, if included in the contract, might have made it easier for Metro to compete for service it is otherwise losing to lower cost local systems.

c. Lack of Current Ridership Information by Route

Metro schedules on-board ridership counts so that each route is checked at least once every two years. Unfortunately, not all routes have been surveyed according to this schedule, although stationary load checks are used as a supplement, as often as three times annually. Many planners believe there is no substitute for accurate and timely counts of riders by route, time of day, and route segment.

Metro has not computerized its ridecheck data in such detail, and as a result, NVTC has been required to structure Metro's raw data into a computerized format much more amenable to effective route planning by jurisdiction staff.

Some jurisdictions supplement Metro's ridechecking program with their own counts, but the results have not been routinely shared with Metro or other jurisdictions.

d. Liability Insurance Costs

Local bus operators throughout the country have been buffetted by the "liability insurance crisis," in which coverage has been canceled or cut, with premiums boosted substantially, all regardless of previous loss experience. Also, a major insurance firm specializing in bus liability insurance went out of business. NVTC's commuter rail project has been delayed due to an inability to obtain commercial coverage at any price. Alexandria's DASH saw its premium almost double after being forced to purchase insurance from a new carrier.

e. Lack of Uniform Performance Standards

What constitutes effective transit performance? On what basis should transit managers be judged? Since public transit properties are not profit-making enterprises, other criteria should be substituted, but no uniform standards have been adopted that apply across political boundaries. Fairfax County has adopted explicit performance standards for its transit routes, but neighboring jurisdictions, and the Metro system itself, have used less formal standards with which to allocate resources among various transit routes.

4. Financing

A 1986 COG study listed facility costs for surface transportation needs in Northern Virginia through 2005. Total needs range from $3.2 to $3.5 billion, including highways, transit, and commuter rail (excluding Federal contributions for systemwide Metrorail construction of $1-2 billion). [1]

a. Metro Cost Allocation Process Favors Local Service

For various reasons, WMATA's cost and revenue allocation process provides an incentive to local governments to substitute local bus service for Metrobus routes. In essence, the jurisdiction making such a substitution is credited with reduced costs that exceed the savings to the Metro system, so that the remaining jurisdictions must pay more.

In addition, the lower operating costs that are achieved by local systems provide further encouragement to reduce Metrobus service.

b. Metro Rehabilitation Costs and Other Future Transit Needs Loom Large

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[1] "Northern Virginia's Transportation Facility Costs," Toni Giardini, COG (June 20, 1986).

Figure 16

KEY FINDINGS OF FEDERAL CITY COUNCIL
METRO FINANCING STUDY

- Metrorail operating and maintenance costs for the Fiscal Year 1986 were expected to be approximately $189 million. By the end of the century, assuming that the full 103 mile Metrorail system is in revenue service, those costs are projected to grow to approximately $292 million, in 1986 constant dollars.

- The study indicated that Metrobus operating and maintenance costs, as expressed in 1986 constant dollars, will remain relatively stable over the next 15 years -- about $230 million.

- In constant 1986 dollars, combined Metrobus and Metrorail operating and maintenance costs are projected to increase from roughly $422 million this year to approximately $525 million by the Year 2000, a 24% increase.

- By the end of the century, WMATA transit operating assistance payments, on either a gross or net basis, will represent about the same percentage of the local governments' total operating expenditures as they do today.

- For the combined WMATA rail and bus system, the annual requirement for rehabilitation and replacement capital funds is projected to rise from $41.8 million in 1986 to $157.5 million by the Year 2000, in 1986 constant dollars. Of that $157 million in the Year 2000, bus capital needs will only amount to $24.7 million, while rail equipment and rail facilities will total $132.8 million.

- Consequently, the Metro system will be faced with a large and increasing bill for capital rehabilitation and replacement in the very near future.

The Federal City Council conducted a detailed study of future Metro financial impacts. [1] The study was financed by the Urban Mass Transportation Administration and prepared by consultants from Peat, Marwick, Mitchell; the Council of Governments; and the Greater Washington Research Center. The key findings of the study are summarized in Figure 16.

The study found that subsidies to cover Metro's operating deficit would remain a modest proportion of local budgets, but significant rehabilitation needs loom in the near future. Under unfavorable assumptions about Federal assistance, local shares of operating assistance, rehabilitation, rail construction and debt service would increase by more than 50 percent from 1986 to 2000, growing from $272.4 million to $412.0 million annually in constant 1986 dollars. Even these costs should be within the capacity of Federal, state and local governments to finance, given the lead time that is available to identify funding sources, and considering the economic and transportation benefits derived from the Metro system.

c. Uncertain NVTC Fuel Tax Revenues

A two percent motor fuels tax is levied within jurisdictions that are members of the Northern Virginia Transportation Commission.

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[1] Transit in the Nation's Capital: What Lies Ahead? Federal City Council (February, 1986).

Proceeds (about $9.5 million annually) are allocated by NVTC to support public transit. In addition, the new Potomac-Rappahannock Transportation District Commission (to consist initially of Prince William and Stafford Counties and Manassas) will levy such a tax. Given the sharp plunge in gasoline prices over the past several months, yields from these taxes are expected to shrink. In the case of NVTC's tax, it may fall to about $8 million annually. The $1.5 million shortfall, if it materializes, has not been budgeted by local governments.

d. Federal Cutbacks in Aid are Threatened

For FY 1987, the Reagan Administration has requested an end to appropriations of Metro construction funds previously authorized by Congress. Metro had sought $250 million, while Congressional committees appear ready to authorize no more than $217 million, as they did in FY 1986.

In addition, the Reagan Administration is seeking to reduce Federal operating assistance provided under Section 9 of the Urban Mass Transportation Act.

IV. IMPROVING CONNECTIONS

In a preceding section, problems associated with inadequate transit connections were set forth, including heavy congestion, crowding near Metrorail stations, changing travel patterns, unserved transit markets, lack of cooperation among providers, and expensive and time consuming transit trips. These are serious problems as viewed by the users and potential users of transit.

To resolve these connections problems and improve transit service in the region, NVTC has undertaken a number of initiatives as part of its Bus Service Coordination Plan. These are described next. In addition, other transit agencies have contributed to more integrated transit systems that are easier to use. Their work is also summarized.

Several proposed developments offer hope for significant future improvements. Progress to date is given on such projects as the Franconia/Springfield Metrorail station and a proposed new station between the Braddock Road and National Airport Metrorail stations.

While most transit service decisions are made by individual local governments, these governments are acutely aware of the need to cooperate. For example, on July 1, 1986, the Fairfax City Council unanimously approved an "open door policy" permitting its CUE buses to pick up and discharge passengers in Fairfax County along routes to the Vienna Metrorail station.

A. NVTC INITIATIVES FOR BETTER CONNECTIONS

The Commission has applied new planning tools and implemented demonstration projects. Through its Management Advisory Committee it has encouraged mutual acceptance of transfers and fare media.

1. New Metrobus Service Adjustment Process

As described thoroughly in the first annual report on the Bus Service Coordination Plan, NVTC (in cooperation with Metro and jurisdiction staff) established a process to plan and implement Metrobus service adjustments in the Orange Line corridor. The components of the process included a formal schedule with ample time provided for analysis of markets and review of drafts, the inclusion of local bus service provided by Fairfax City's CUE, a set of objectives for the service adjustments, a regular forum for staff discussions, a series of informal public meetings to receive early public input, formal public hearings, an Opening Day Committee to coordinate ceremonies, and a joint marketing effort to promote the new routes.

The bus service adjustments occurred on June 22, 1986, just two weeks after the four new Virginia Metrorail stations opened. Staff began preparations as part of the coordination process as early as November 1984. The public meetings in September and October of 1985 provided early indications of needed revisions to preliminary plans, usually involving readjustments to minimize travel time and fare impacts associated with turning back buses to feed the new rail stations. Among the changes that

were made in response to public concerns was continuing limited Metrobus service from Reston beyond the West Falls Church Metrorail station to the Pentagon and Crystal City. Also, the Metrobus zone boundary was altered near the East Falls Church Metrorail station to eliminate an extra zone crossing charge for many bus patrons.

The set of Metrobus service adjustments that went into effect on June 22, 1986 in the Orange Line corridor are expected to increase total Metrobus subsidy payments by $834,000 annually. This occurs because many routes were shortened, with a consequent loss of revenue, and new routes were added (e.g. the new 12C serving Centreville in Fairfax County). However, the opening of the four new Metrorail stations were expected to reduce systemwide Metrorail subsidies by $1.7 million. Therefore, combined savings should total $0.9 million annually.

The lessons learned in the almost two years since the process began will prove useful as bus service is adjusted in the future, albeit on a smaller scale. NVTC now maintains a Bus Service Adjustment File, which is a record of inquiries and comments received about bus routes in Northern Virginia. These are referred to the appropriate transit system for consideration, and NVTC follows up to inform the citizens of the results of their queries.

Also, input at the public meetings and hearings may lead to major future revisions in the way bus service is provided. For example, testimony regarding Reston Metrobus routes emphasized the utility of a hub or transit center concept, in which short routes would originate from a central transportation and information center, which -- if located in

Reston -- would be used by Metro, vanpools, and RIBS (Reston's Internal Bus System sponsored by the Home Owners Association).

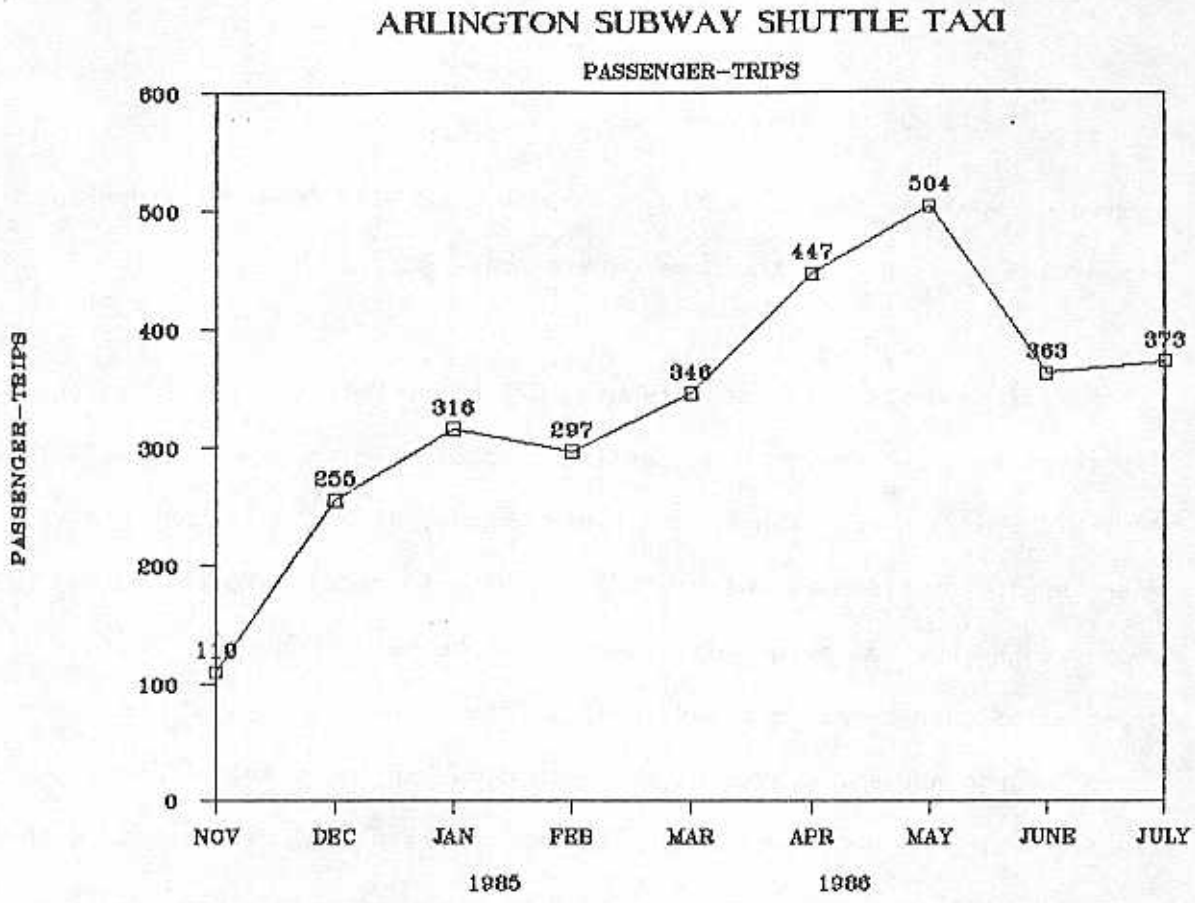
A serious difficulty with planning effective Metrobus routes is the length of time necessary to accomplish changes. For example, if a jurisdiction is aware of a needed route change, it normally must contact Metro staff for planning materials in January to receive Metro Board approval in February of a public hearing to be held in March. Board approval of changes would occur in April, rescheduling by staff would occur through August, driver picks would occur in early August for implementation in September. Even though under special circumstances the service adjustments can be accomplished on a shorter timetable (e.g. Vienna turnbacks occurred in June, 1986) lengthy lead time is one factor which encourages local governments to operate their own bus service. On the other hand, adequate public notice and involvement of citizens in the route planning process has obvious benefits that should not be sacrificed in the interests of speed.

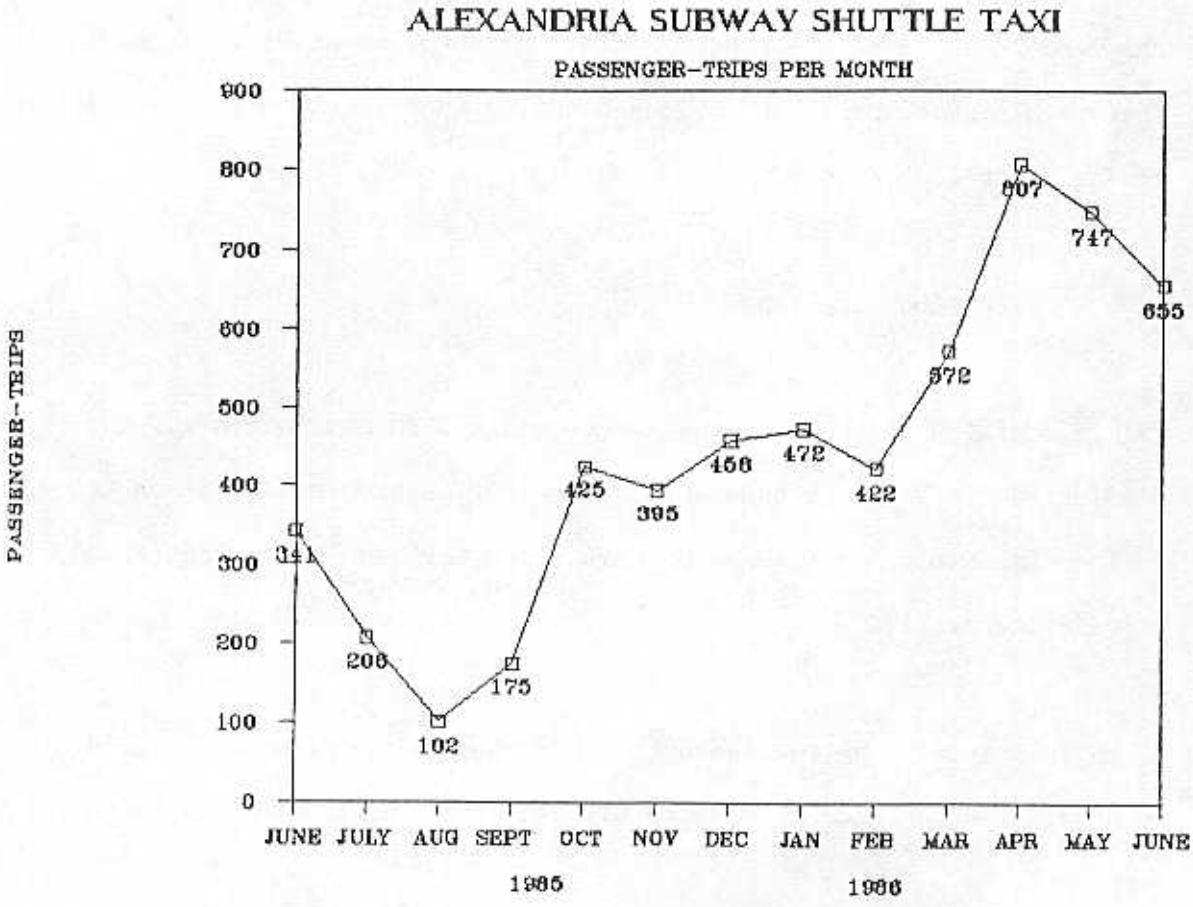
2. NVTC Demonstrations

In addition to the planning improvements NVTC has initiated, the Commission continues to undertake demonstration projects to learn how to improve transit connections and communicate the results to public and private operators.

NVTC has underway two demonstrations that use private taxi operators to provide better access to Metrorail stations during hours in which these

Figure 17


ARLINGTON SUBWAY SHUTTLE TAXI
PASSENGER-TRIPS
PASSENGER-TRIPS
600
500
400
300
200
100
0
110
255
316
297
346
447
504
363
373
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUNE
JULY
1985
1986


ALEXANDRIA SUBWAY SHUTTLE TAXI
PASSENGER-TRIPS PER MONTH
PASSENGER-TRIPS
900
800
700
600
500
400
300
200
100
0
341
206
102
175
425
395
456
472
422
572
807
747
655
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUNE
1985
1986

stations are not well served by buses. In Arlington, a contract with Arlington Yellow Cab provided two taxis and drivers to operate at 20-minute frequencies along the southern portion of the Route 22 Metrobus line after 9:00 P.M. on weeknights and all day Saturday. Metrobus Route 22 does not operate during those times, and although residents had requested bus service, Arlington County could not justify it given the expense for relatively modest expected ridership.

NVTC's Arlington Subway Shuttle Taxi began in November 1985. As illustrated in Figure 17, ridership grew steadily, as a result of convenient service, drivers who aggressively marketed the program, widespread distribution of brochures by NVTC, and inexpensive fares. Another plus is a "route-deviation" feature, in which passengers may request doorstep service within a quarter mile of the route at no extra charge. Fares are identical to those assessed by the Metrobus system, and Metrorail transfers are honored.

A patron survey conducted in June 1986 revealed that most Arlington SST passengers were making work-related trips although significant minorities used the service for shopping and recreation. Surprisingly, the majority of respondents did not request doorstep service and most patrons were using the service more than three times per week. About half of the respondents indicated they used Metrorail more frequently as a result of the SST. Virtually all respondents gave the drivers high marks for courtesy and performance although few felt it had increased their use of full fare taxi cab service during non-SST hours. Respondents were almost unanimous in rating the SST as better than Metrobus service.

In Alexandria, the Commission contracted with eight firms representing the great majority of the City's taxi fleet to serve three Metrorail stations after 8:00 P.M. on weeknights. Special subsidized zone fares applied; NVTC paid only for trips provided, as opposed to leasing vehicles as was done in Arlington. NVTC paid each driver the difference between the meter reading for a trip and the zone charge (which varied from $1 to $4, depending on distance from the stations). Mid-way through the program, NVTC added a $1 per trip bonus for drivers to encourage their participation. In July 1986 an exclusive taxi stand for the SST service was added at the King Street Metrorail station.

After an initial dip in Summer 1985, ridership on the Alexandria SST grew steadily through the remainder of 1985, stabilized in early 1986, accelerated dramatically after March, and dipped again during the summer. (See Figure 17.) Passenger surveys revealed that most passengers regarded the service as excellent, and this experience contributed to increased Metrorail patronage. However, since not all drivers from the participating companies were willing to offer the reduced fares, some patrons complained of being refused service. NVTC's $1 driver bonus, the exclusive taxistand and tightened enforcement on the part of taxi companies appear to have reduced the incidence of this problem.

The SST has proved to be a cost-effective public transit service for time periods when traditional transit ridership is particularly low. The subsidy per passenger trip on the Alexandria SST averaged $3.02 as of May 1986. (This figure includes a $1.00 per trip driver bonus which will be discontinued in the Fall.)

Figure 18

TYSONS SHUTTLE RIDERSHIP
AVERAGE DAILY RIDERS
(June 6 - July 31, 1986)

DATE	DAILY TOTAL	AM TOTAL	ARRIVE METRO	DEPART METRO	PM TOTAL	ARRIVE METRO	DEPART METRO
June 16-20	96.2	50.0	29.2	20.8	46.2	14.4	31.8
June 23-27	136.0	71.6	42.0	29.6	64.4	24.6	39.8
June 30-July 3	146.3	81.0	47.0	34.0	65.3	22.8	42.5
July 7-11	160.0	85.4	43.4	42.0	74.6	33.2	41.4
July 14-18	153.6	85.8	42.2	43.6	67.8	32.4	35.4
July 21-25	162.6	86.8	43.8	43.0	75.8	36.6	39.2
July 28-31	178.0	94.3	45.8	48.5	83.8	37.0	46.8

NVTC: 08/08/86

An analysis of late-night fixed route transit services in Alexandria indicates that the SST subsidy is roughly comparable to the incremental cost of Metro and DASH on a person-trip basis. In contrast to Metrobus and DASH, the Alexandria SST offers doorstep service and serves a different transit market.

The Arlington SST subsidy per passenger trip on weeknights is significantly higher than the Alexandria experience because the Arlington SST operates on a fixed schedule, while in Alexandria, only passenger-trips actually taken are eligible for subsidy. The Arlington weeknight SST subsidy averaged $5.67 per passenger-trip in May 1986. If the Metrobus 22 service was extended into the evening on the same schedule, the subsidy per passenger-trip would be significantly greater based on current SST ridership.

On June 16, 1986, NVTC initiated still another shuttle, this one christened the Tysons Shuttle. Three 14-passenger vans operate between the West Falls Church Metrorail station and the Westpark area near Tysons Corner in Fairfax County. The cash fare for a one-way trip is 60 cents; round-trip is $1.00; and use of an eleven trip ticket book (sold for $5.00) lowers the fare to 45.5 cents per trip. Service operates at 12-minute intervals during rush hours. As of August, ridership exceeded 200 trips daily. Figure 18 illustrates ridership on an average weekly basis for June and July of 1986.

The Tysons Shuttle route connects several large office buildings and the Rotonda condominium complex with the Metro system, providing an opportunity for both flow and counterflow trips in each rush period. In fact, trips on the Shuttle are very evenly balanced. The fact that the service is well used by employees to access jobs in the Tysons Corner area should help to convince employers and developers to support such a system as a means to provide tangible improvements to their worksites.

These NVTC demonstrations serve several purposes. First, they explore means to improve access to the Metrorail stations, not only for commuters traveling in the peak flow direction, but also for those who wish to travel counterflow to reach jobs, or who travel at off-peak hours. The demonstrations stress flexibility, using smaller vehicles and private contractors. They also emphasize efficiency by seeking to provide better service at less cost than more traditional transit services.

Passenger surveys and operating results indicate the demonstrations have achieved those purposes. Arlington will take over the Arlington SST in Fall 1986. Alexandria is studying how to continue the Alexandria SST after a special extention of service through September 1986. The Tysons Shuttle, which has experienced such sharp early growth, should be a candidate for expansion and continuation, most likely using a combination of private sector and government funding, when the demonstration ends in June 1987.

3. Identifying Unserved Markets

Since Northern Virginia is experiencing rapid growth of jobs and population, it is likely that historic transit routes will not provide good service to newly emerging areas of the region. Analysis of Census data from 1980, although useful for many purposes, cannot reveal all of these emerging geographic transit markets. Also, other new markets (e.g. employees wishing to move perpendicular to traditional radial transit routes to reach jobs across Fairfax County) may go unserved, although several cross-county Metrobus routes have been established (e.g. #10, 26,28, 29). To help identify such unmet transit needs, NVTC conducted a market research demonstration project in early 1986. Two potential transit markets were investigated using an innovative self-administered home interview approach.

In Falls Church, 1,200 households completed survey forms delivered to their homes and picked up two days later. The survey asked about willingness to use proposed feeder service to nearby Metrorail stations. Responses were screened by analysts to consider such factors as whether workplaces were within walking distance of Metrorail, cars were needed on the job, and cheap parking was available. The findings of the Falls Church analysis were presented to the City Council in June 1986.[1] The consultants predict that approximately 580 trips would be taken on the

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[1] Market Research on the Feasibility of A Neighborhood Minibus Feeder System to Metrorail, Robert Hitlin Research Associates, Inc. and SG Associates, Inc. (May 1986).

FALLS CHURCH PATRONAGE ESTIMATES

DAILY TRIPS

(Value in parentheses is expected error at 90% confidence level)

SERVICE FREQUENCY	FARE LEVEL		
	Free	$.25	$.50
10 minutes	1324 (± 202)	1308 (± 200)	844 (± 164)
15 minutes	1116 (± 186)	1106 (± 186)	718 (± 152)
20 minutes	900 (± 168)	812 (± 162)	580 (± 138)

Figure 19

Source: Market Research on the Feasibility of A Neighborhood Minibus Feeder System to Metrorail, Robert Hitlin Research Associates, Inc. and SG Associates, Inc. (May 1986).

shuttle each day at 50-cent fares, as shown in Figure 19. The Council voted to proceed with development of an operational plan based on these findings.

The survey methodology is unique in that it relies on a combination of self-administered surveys that are hand-delivered and picked up, together with a telephone follow-up survey to check for potential response bias. The result is a set of usable surveys delivered at a total cost, including processing, of approximately $10 per individual respondent. This compares to as much as $40 or $50 each for other surveys reported in the transit literature.[1]

In Centreville, the initiation of Route 12C Metrobus service has provided an excellent opportunity to test the survey method. Survey responses compiled in this community before the bus route started on June 22, 1986 can be compared to actual ridership on the new route. Since the purpose of NVTC's project was to develop an inexpensive and effective means to identify potential transit markets in currently unserved areas, the Centreville case study will be especially instructive.

The consultants projected a market of 43 persons for the new Metrobus #12C.[2] On opening day, 30 persons used the bus, and by early July, daily ridership had reached 43.

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1 A Comparison of Telephone and Door-to-Door Survey Results for Transit Market Research, Robert Hitlin, et al; paper submitted to Transportation Research Board, (August 1986).

2 Market Research for Metrorail Feeder Bus Service in Centreville, Fairfax County, Virginia, Robert Hitlin Associates, Inc. and SG Associates, Inc. (June 1986).

The consultants in this market research project will deliver a handbook to facilitate the widespread application of this method by NVTC and local governments.

4. Cooperative Design and Implementation of Transit Routes

In 1984 it was learned that the Defense Intelligence Agency would transfer several thousand Virginia-based jobs to Bolling Air Force Base in the District of Columbia. Many of these employees currently used transit (about a third), yet adequate Metrorail-Metrobus connections were not available at the new site. NVTC and D.C. initiated a new Metrobus Route W-3 providing shuttle service between the L'Enfant Plaza Metrorail station and Bolling Field, and share in the subsidy cost in proportion to ridership by residents of each jurisdiction. As of the end of FY 1986, NVTC pays about two-thirds of the subsidy cost. Ridership has held steady at over 250 persons daily.

A major developer in Northern Virginia, the Charles E. Smith Company, contacted NVTC for help in improving transit access to their Skyline City complex near Route 7 in Fairfax County at the Alexandria boundary. The Smith Company wished to improve its leasing opportunities and believed a strong Metro link would provide a competitive advantage. NVTC staff explored various transit approaches for serving Skyline City and contacted Metro about bus service that already operated nearby. After NVTC and the Smith Company examined the costs and benefits of several transit options, the Smith Company concluded that a slight modification in existing Metrobus service would accomplish its objective without the expense of operating a duplicate service.

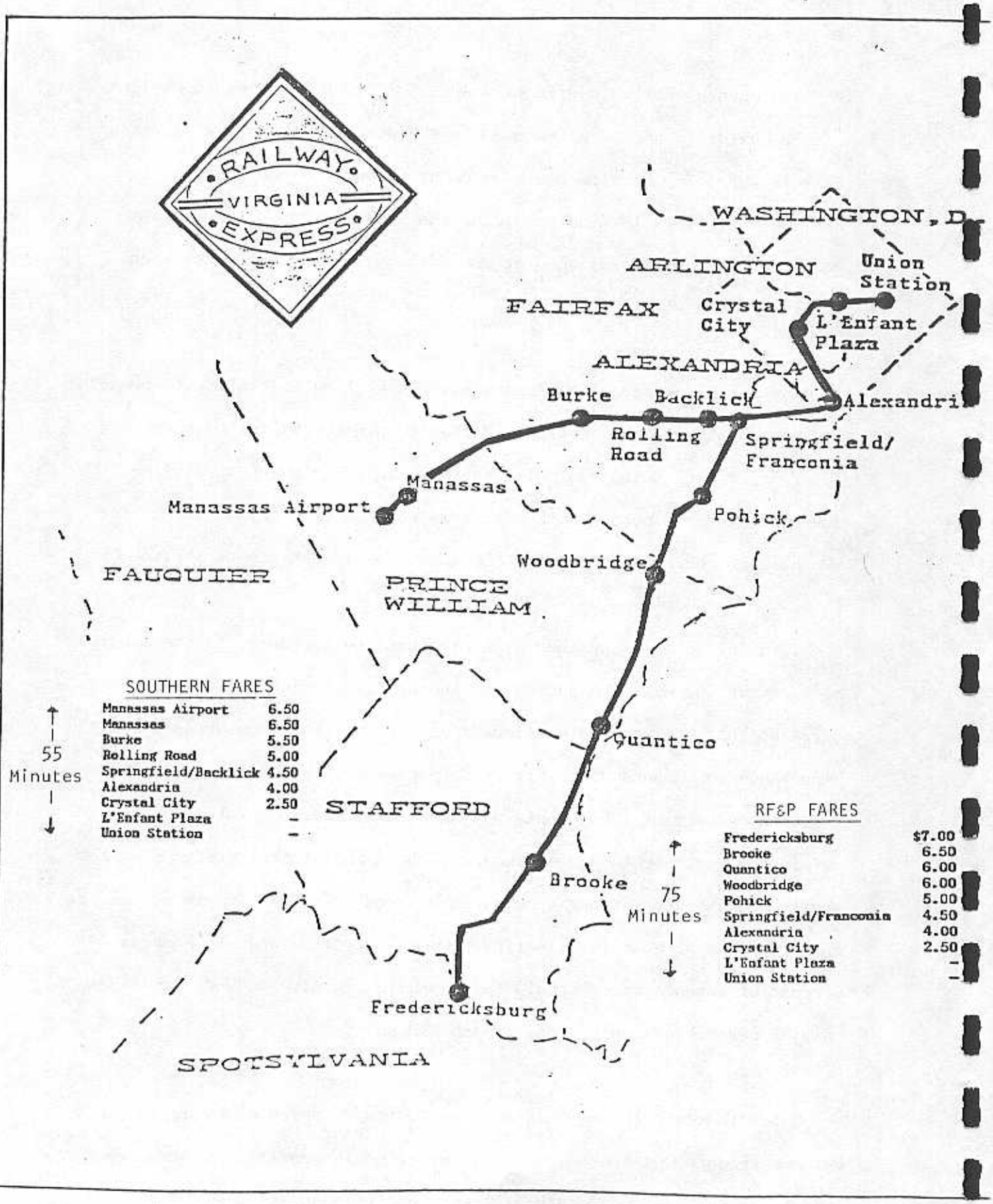
The change went into effect on August 4, 1986. Access to Skyline City office buildings has been improved by the placement of a new bus stop on Metro's 28F. The service operates counterflow from the Pentagon to Skyline City every 15 minutes during the peak periods. The route modification was accomplished at no additional cost under the General Manager's authority.

The Smith Company also plans a major marketing initiative to promote the re-routed Metrobus service. Tentative plans call for cooperative advertising with Metro that will feature the 28F service in Skyline City advertisements. Another option that is under consideration is a major purchase of rear bus cards with the message, "Take Metro to Skyline City."

This enlightened approach by a developer runs counter to the findings of a recent survey. The survey by Peabody Fitzpatrick Communications revealed that brokers and developers as a group tend to underestimate the importance to tenants of proximity to public transportation. The 1986 telephone survey of 100 tenants and an equal number of brokers, developers, architects and engineers, showed that tenant preferences for public transit were strongly devalued by brokers/developers in evaluating factors of importance in selecting commercial office space. Whereas 49 percent of tenants rated proximity to public transit as "very important," only 35 percent of brokers/developers did so.

Most other attributes that were evaluated revealed close agreement between tenants and brokers/developers, although proximity to downtown, ability to expand, and length of lease were also underestimated by the brokers/developers.

Figure 20



SOUTHERN FARES

Manassas Airport	6.50
Manassas	6.50
Burke	5.50
Rolling Road	5.00
Springfield/Backlick	4.50
Alexandria	4.00
Crystal City	2.50
L'Enfant Plaza	–
Union Station	–

RF&P FARES

Fredericksburg	$7.00
Brooke	6.50
Quantico	6.00
Woodbridge	6.00
Pohick	5.00
Springfield/Franconia	4.50
Alexandria	4.00
Crystal City	2.50
L'Enfant Plaza	–
Union Station	–

These findings suggest that brokers/developers should give more attention to proximity to public transit in site selection and in marketing, and perhaps local zoning requirements could require transit improvements in the same way that parking is required. And, the survey should reinforce the economic benefits that accrue to the business sector from increased accessibility due to public transit. This conclusion supports the belief that the private sector should be willing to help pay for effective public transit services.

5. Commuter Rail Project

In the early 1970's, NVTC undertook a massive demonstration of express buses on the new Shirley Highway busway, using $6 million in Federal grants. The Commission now has underway a project that ultimately may dwarf the earlier, highly successful Shirley Highway Demonstration. NVTC is seeking to implement a two-year, eight-train commuter rail experiment on two rail lines: 1) The RF&P line between Fredericksburg and Union Station in the District of Columbia; and 2) The Norfolk Southern line between Manassas and Union Station. Figure 20 is a map of the proposed stations on the two lines.

This project had its inception in 1964, the year the Commission was organized. Since that time, despite repeated efforts, NVTC has not succeeded in initiating commuter rail service. The current effort, which appears likely to succeed, combines elements of NVTC's previous experience in demonstrations, identifying unserved transit markets, and cooperative design and implementation of transit routes.

Initially it is expected that the service (four trains on each line during rush hours) would carry 6,000 one-way passenger trips daily. A supplementary ridership study is now underway that may refine these forecasts. The 6,000 trip estimate (by COG) is conservative, since it assumed service would terminate in Alexandria, rather than D.C., and that no current commuter bus users would divert to commuter rail. On the matter of commuter bus operations, NVTC examined the potential of a massive new commuter bus system in lieu of commuter rail, but concluded that such a large-scale use of buses would be difficult, given heavy traffic congestion south of the Beltway and the scarcity of parking for the vehicles between rush hours.

It is likely that new opportunities will be created for bus operators, however, since NVTC's rail service will offer only four trips on each line in each direction during rush hours. Demand may exist for additional bus trips to and from commuter rail stations on the "shoulders" of the rush hours and during off-peak hours, including weekends. Shortly after plans for a single-train pilot project using AMTRAK's Virginian on the RF&P line was announced, Greyhound Corporation agreed to honor commuter rail tickets for its routes paralleling that of the RF&P. This backup service by Greyhound should be mutually advantageous.

Planning for the pilot project using the Virginian between Fredericksburg and the District of Columbia has offered an intense lesson in intergovernmental cooperation and privatization over the past year. Governments that have never supported public transit financially (e.g. Stafford County) have agreed to help finance the commuter rail project.

Stafford, together with Prince William County and Manassas, have formed a new transportation district commission (Potomac-Rappahannock) which levies a two-percent motor fuels tax, the proceeds of which can be used to help pay for commuter rail service. The Virginia General Assembly approved amendments to the Tort Claims Act to ease the difficulty of protecting NVTC and the other jurisdictions against liability, and provided a $5 million contingency loan reserve for claims. The Virginia Department of Highways and Transportation provided management and design expertise for parking lots, as well as significant financial aid. A local Congressman was instrumental in obtaining a $1 million Federal grant for capital costs. Members of local Boards of Supervisors worked diligently to identify suitable station locations. Virginia's Governor personally negotiated with railroad officials to win their cooperation on troublesome issues involving liability, and offered significant funding for marketing.

It cannot be stated with certainty when the Virginian and the full eight-train experiment will begin to offer service. Major hurdles remain to be overcome, not the least of which is a shortfall of $15 million for capital and operating costs that must be covered from a variety of public and private sources. Nonetheless, lessons have been learned in the two-year effort to get the trains rolling that will serve the NVTC jurisdictions and their neighbors well in future years. Among those lessons is the stern realization that Northern Virginia's traffic congestion can not be alleviated by band-aids applied only within NVTC's jurisdiction. Permanent solutions require close cooperation with neighboring jurisdictions that are experiencing strong growth, and will send commuters to and through NVTC's boundaries in increasing numbers.

Appendix C provides a detailed summary of the commuter rail project and a set of tables showing financial requirements.

6. Fare Incentives

To encourage passengers to make transit trips requiring transfers, a reduced fare incentive would be useful. Currently, a Metrorail passenger receives a 35-cent discount on Metrobus in Northern Virginia, while a transfer to a Metrobus in D.C. is free. Transfers among Metrobuses are also free, although relevant zone charges do apply. However, DASH and CUE do not accept Metrorail transfers for the 35-cent discount, since their fares are lower than those of Metro. The Fairfax Connector does accept Metro transfers, but that system has the same fares as Metro.

Another fare incentive strategy that NVTC staff are exploring for the Northern Virginia Railway Express is the opportunity for commuters receiving free parking to exchange this benefit for a reduced commuter rail fare. The proposal calls for parking spaces to be brokered between commuter rail patrons who no longer need them and auto commuters who are willing to pay for the vacated spaces. Obviously, there are several administrative, legal and tax implications for this concept but the basic principle is to market transit through fare reduction incentives.

NVTC has applied for a $100,000 Federal grant to provide an experimental reduction of 5-cents per trip for persons transferring onto Metrorail from any bus system. The grant request is still pending.

7. Travel Time Improvements

NVTC has sought to regain access to the Dulles Access Highway for Metrobuses. With the opening of the Dulles Toll Road in 1985, Metrobuses were physically blocked from reaching the toll-free facility, and forced to contribute $80,000 in tolls each year for using a Toll Road that, because of congestion, slowed bus travel speeds and made service less reliable.

In August 1986, new slip ramps opened that permit Metrobuses to cross over to the Dulles Access Highway again, thereby avoiding the lengthy queues on the Toll Road.

Also in August 1986, VDH&T lengthened HOV-restricted hours on I-66 to 6:30 A.M. to 9:00 A.M. and 4:00 P.M. to 6:30 P.M. A congressionally mandated experiment had imposed shortened hours in 1984. According to consultants' studies, the shortened hours choked the facility at certain times, and the congestion significantly delayed Metrobus service. Some Metro routes were forced off I-66 altogether to use local streets in order to avoid the delays. Now, however, few Metrobuses use I-66, after the June 7th opening of four new Metrorail Stations and subsequent bus turnbacks on June 22nd. Several elected officials had requested that VDH&T study the effect of the new Metrorail opening before lengthening the hours.

8. Study of Access to New Metrorail Stations in Fairfax County

The Fairfax County Board of Supervisors recently directed its staff to analyze access and parking issues at the three new Metrorail Orange Line stations in Fairfax County. One of the issues that this study will address is whether or not the feeder bus services are being used by residents who are within a reasonable walking distance of bus service. The investigation will also seek to identify areas that lack feeder bus service but have a significant number of commuters who park and ride at Metrorail. These areas may become candidates for new or re-aligned feeder bus services. County staff have contacted NVTC about a cooperative study effort.

9. Investigation of Firms, Buses, and Vans Available for Contract Transit Service

As local governments, employers and developers are alerted to the need for better connections for current and potential transit passengers, the need to contract for service should become more apparent. Potential sources of: 1) vehicles, 2) drivers, and 3) management expertise are varied. WMATA is potentially able to offer all three categories, but in practice is limited by its high driver wages and overhead cost and by Federal restrictions on the use of its buses (since they have been purchased with 80 percent Federal matching grants).

Local government bus systems, such as DASH, typically do not have many excess vehicles (except for off-peak, short-term charters). Private taxi firms may not have access to large buses. But, private management firms are often able to broker vehicles, drivers, and management into an effective package. NVTC has successfully used such a management firm approach to operate its Tysons Shuttle demonstration, while contracting directly with taxi firms in two other projects, and with Metro in another (the 66X, an express bus route operated between the West Falls Church Metrorail station and Rosslyn prior to the opening of the Orange Line to Vienna).

NVTC is conducting a survey to be completed in the Fall of 1986 of firms potentially able to supply either vehicles, drivers, or management. A detailed list of names, addresses, and telephone numbers will be available upon request as well as information on each firm's ability to provide contract services.

B. METRO INITIATIVES

Because WMATA manages the region's largest public transit system, any efforts to improve connections for passengers of necessity will involve Metro, and the Authority has been very cooperative in the NVTC initiatives described above. Further, the Authority has undertaken several of its own studies and experiments in an effort to bolster customer access.

1. HOV Parking Experiment and other Parking Enhancements

Many Metro patrons desire to drive to Metrorail stations to park. However, relatively few stations in Northern Virginia include parking (viz., Huntington, 2,062 all-day spaces, 37 non-rush hour spaces; East Falls Church, 300 spaces; West Falls Church, 1,000 spaces; Dunn Loring, 1,000 spaces; and Vienna, 2,000 spaces). And, these few spaces fill rapidly, even at the four new stations. Accordingly, the Metro Board has approved an experiment in which parking preference will be given to automobiles carrying two or more Metrorail passengers. The experiment is underway at two lots at the Huntington Metrorail Station from 6:00 A.M. to 7:30 A.M., Monday - Friday. A vehicle containing two or more persons is considered an HOV-vehicle. On the first day of the demonstration, the lots were slow to fill - only about one-fourth of the spaces of both lots were filled by 7:30 A.M. There seemed to be some patron confusion closer to 7:30, as most (if not all) of the non-HOV spaces were filled and Metro's signs about the HOV hours were not legible from a distance. As of August 15, the confusion has diminished and the number of HOV-spaces has been decreased as more spaces were reserved initially than needed.

In addition, the Board has set for public hearing the concept of assessing non-Metro parkers using Metro lots a daily fee that may range from $6.00 to $12.00, as opposed to $1.00 or $1.25 daily fees for Metro patrons. Metro patrons would be identified by valid bus transfers obtained at the boarding stations. At several Maryland Metro stations, workers from nearby office buildings have begun to use Metro's lots, thereby crowding out potential Metro patrons. This may become a problem for Virginia jurisdictions in the future.

The Metro Board has been unable to agree on across-the-board parking fee increases, since the jurisdictions in which the lots are located are seeking to use the revenue for parking lot expansion or to finance reduced-fare Metrorail trips for their residents. The other jurisdictions believe that added parking revenue should continue to accrue to all jurisdictions, just as joint development revenue does.

2. Local/Regional Bus Study

During 1984 and 1985 Metro staff undertook, at the direction of the WMATA Board, a lengthy study of ways in which the regional authority interacts with its customers and the local bus systems of its member jurisdictions. One important, but controversial, component of that study was an assessment of the conditions under which local bus systems should be permitted to have access to Metrorail stations.

The Board's policy is still not final, but in the interim, transit operators wishing to gain access to a Metrorail station must reach agreement with the Authority. Access is free, but adequate insurance is required ($3 million) to indemnify Metro against claims.

To date, no major Virginia operators have been denied access, including private firms (e.g. the Washington Flyer serves the West Falls Church station, and NVTC's taxi and van operators serve several stations). A private van operated by the Rotonda condominium complex was refused access, but NVTC's Tysons Shuttle serves those residents during rush hours.

Another aspect of the Local/Regional Bus Study was subsidy allocation and residual liability. Minor adjustments were made to the Metrobus cost allocation formula as a result of the study's recommendations. These changes should serve to reduce somewhat the tendency of the formula to reward jurisdictions who reduce Metrobus service with cost savings in excess of those experienced by the system. Metro staff subsequently proposed a future $250,000 consultant study to examine allocation formula revisions, and the Metro Board is now considering whether to proceed.

Another important component of Metro's Local/Regional bus study was its proposal to move aggressively into new markets using non-traditional means. In November 1985 staff proposed to identify markets selectively and tailor service, vehicles, and marketing to compete against automobiles and other transit providers. Bus routes would be revised to let passengers transfer more easily; smaller buses, vans, and taxis would be used to cut costs and provide more frequent and flexible service. Metro's focus would be expanded from a downtown orientation to a regional orientation. New high-speed bus routes would be established with frequent service. More park-and-ride lots would be built. Some service would be contracted out to private operators.

This concept was received enthusiastically by the Metro Board. The concept paper is attached as Appendix D. Phase I (in which several specific sites were proposed for a one-month demonstration) was presented to the Board's Operations Committee in August 1986.

In a related study, Metro examined the feasibility of utilizing more small buses (30 and 35 feet in length) versus full-sized buses (40 feet). Among the Virginia Metrobus routes identified as potential candidates for 35-foot bus service are the 15K and M serving Chain Bridge Road in Fairfax County, 23ACT on Glebe Road, 24 at Tysons Corner, and 25 at Landmark. Route 22 in Arlington (NVTC's Arlington SST serves this route) was identified as a candidate for service by 30-foot buses. Approximately 35 Virginia Metrobuses would be involved. The study was based on 1985 conditions, however, and revised travel patterns may alter the findings. Nonetheless, where passenger volumes are too light to fill full-sized buses, modest capital cost savings could be realized by using smaller buses. More important is the public perception that large buses are too noisy and unwieldy, destroy pavement, and -- if devoid of passengers -- are inefficient.

Metro staff is revising its estimates and should report soon to the Metro Board. In the meantime, the D.C. Government will purchase twenty 30-foot buses and will contract out to Metro to operate the buses for the first year. After the first year, it is likely that the City will take over operations of the 20 buses.

Finally, as part of its series of actions on the Local/Regional Bus Study, the Metro Board called for a year-long analysis of the feasibility of a garage cost center approach to allocating Metrobus costs. Such an approach offers the opportunity for improved management and accountability to the jurisdictions.

3. Metro's Policy on Service for Ambulatory Handicapped Persons

On January 9, 1986 the Metro Board approved a policy calling for half of the active Metrobus fleet to be equipped with lifts, by 1994, by equipping half of newly purchased buses. The recommendation followed a year-long study. The cost to equip half the fleet with lifts would be $5 million annually.

Metro will retain its On-Call service (requiring 24-hour advance reservations), and continue to rely on local governments, social service agencies, and private operators to help serve this market.

NVTC has contracted with a local taxi operator to provide lift service on its Tysons Shuttle route, with 24-hour advance reservations. NVTC's commuter rail service will also be fully accessible, with lifts on platforms and ramps from parking lots to platforms.

4. Strategic Plan

Metro is developing a strategic plan to set a more effective course for the Authority. A draft is awaiting consideration by Metro's General Manager.

One of the most troubling issues facing WMATA today is the strong pressure being exerted by local governments to substitute their own local bus service for that of Metro. For example, a consultant study by ATE

Management and Service Company, Inc. released in mid-July 1986, predicted Prince George's County could save over $3 million annually by operating its own fleet of buses. Virtually every jurisdiction has begun or is considering substitute or complementary service. While the trend is not in itself undesirable, it appears to be driven by a biased cost allocation formula and a lack of interest on the part of Metro in competing for the routes it is losing. For example, the new labor agreement with Metro's largest union, ATU Local 689, appears to lack any effective provisions designed to help make Metrobus more competitive.

C. OTHER INITIATIVES

Other organizations, including COG, VDH&T, and regional planning groups and local governments have undertaken projects that serve to improve connections for transit passengers.

1. COG Study of Bethesda-Tysons Shuttle and Reverse Commuting

The Urban Mass Transportation Administration has approved a grant to COG to study the feasibility of a shuttle service connecting Bethesda with Tysons Corner and nearby Metrorail stations. A private carrier in the Washington Metropolitan area has indicated an interest in providing such service. The prospective private carrier has indicated to COG a need for a feasibility study including special market-oriented information. COG also examined the potential of an ongoing program to improve

reverse-commuting opportunities linking suburban Virginia jobs with District of Columbia residents. Construction firms are now importing workers from as far as West Virginia and Pennsylvania, while D.C. unemployment remains well above that of the suburbs.

2. VDH&T Park-and-Ride Lots

In a June 4, 1986 speech to NVTC, Governor Baliles promised to re-examine opportunities for additional park-and-ride lots. He mentioned the Franconia/Springfield area as a logical location. Fairfax County recently received a Federal grant from UMTA to identify additional sites. The County staff are now in the process of putting together a Request for Proposals (RFP) to hire a consultant to identify the sites. In addition, lots served by Fairfax City's CUE bus offer favorable potential.

According to VDH&T planners, it costs about $1500-3200 per space to build surface park-and-ride lots, while a structure space in Arlington would cost perhaps $15,000 and in the District of Columbia $20,000. Accordingly, suburban park-and-ride lots make sound economic sense.

3. Northern Virginia Planning District Commission's Fare Wheels Demonstration

As described above, NVPDC began a demonstration in 1984 using Federal funds for a user-side subsidy program for elderly/handicapped transportation. Initially, Arlington and Falls Church participated, and

currently the City of Fairfax is also participating in the service. NVPDC is looking to expand operations to other jurisdictions as new agencies join in the service. (Fairfax County operates its own specialized transit system for the elderly and handicapped, known as FASTRANS and the City of Alexandria operates DOT, a specialized public transportation service for the disabled.)

D. PROPOSALS FOR THE FUTURE

The initiatives described above are all ongoing efforts to improve coordination among transportation providers in Northern Virginia and consequently enhance connections for passengers. Several additional developments, although still in the planning stages, offer significant promise for the future.

1. Contract Bus Service in the Shirley Highway Corridor

The extensive Metrobus service operated in the Shirley Highway corridor would appear to be a logical candidate for contract operation by a private firm. Also, Western Development, developer of Potomac Mills, a major shopping center located on I-95 in Prince William County, is seeking to draw up to 100 additional charter buses daily. Opportunities exist for private operators to initiate contract service to the center from Northern Virginia and elsewhere.

2. Contract Service in the Orange Line Corridor

In the future, it is considered likely that the Fairfax County Board will seek to contract for routes from Reston/Herndon currently operated by Metrobus. The Falls Church City Council has asked its staff to design a local feeder service to nearby Metrorail stations. Connections between Metrorail and the stores and offices of Tysons Corner still need improvement, especially as the Tysons Shopping Mall is expanded and nearby Tysons II comes on line in the next few years. Metro staff have proposed a one-month experiment to improve bus service to the Tysons Shopping Mall before Christmas 1986.

3. Dulles Access Rapid Transit

In response to a Congressional request for a study of alternative means to improve transportation in the Dulles corridor (Section 15 of Public Law 98-443), the U.S. Department of Transportation initiated a study directed by Rice Center. The final report was published in late 1985.[1] It used the Dulles corridor as a test case to examine the feasibility of a public/private partnership to undertake a new light-rail system. The study concluded such a partnership could produce a feasible light-rail line with some public and some private elements, at considerable savings to the more traditional all public approach. A draft Request for Proposal was included to be used by local governments, if they choose to go ahead with the project.

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[1] Dulles Corridor Rapid Transit Development Feasibility Report, Rice Center, et al. (October 1985)

The consultants determined that a fully operational system linking the West Falls Church Metrorail station and Dulles would cost $143.5 million in 1985 dollars to build and obtain equipment, with annual operating costs of almost $5 million. Travel time would be 21 minutes, with ridership of 14,000 persons per day by the year 2000.[1] According to the study, private sector ownership of the line would save about a third ($62 million) of the public sector total cost. [2]

A private group known as Dulles Access Rapid Transit (DART) has been formed to seek to build and operate such a rail line, with emphasis on the private sector. Its Chairman is Najeeb Halaby, a former Administrator of the Federal Aviation Administration, and board members include two former secretaries of the U.S. Department of Transportation, among others. DART's plans call for a $165 million light-rail line down the median of the Dulles Access Highway using seven stations spaced over 16.7 miles.

The capital costs of the line would be financed by selling equity, selling tax benefits, seeking developer contributions, asking for governments to back bond sales, and using FAA land. According to DART supporters, operations would be self-supporting, but debt service must be met from some other -- as yet undetermined -- source. Most operating and financial details have not been presented publicly.

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[1] Id. at iv.

[2] Id. at vii.

DART and its supporters point to future growth in the corridor and the fact that the new Dulles Toll Road quickly exceeded projections and must be expanded. Skeptics argue that developers will need zoning concessions to be willing to participate.

4. Completing Metro's Yellow Line to Franconia/Springfield

The Fourth Interim Capital Contributions Agreement signed by Metro's member jurisdictions in 1984 called for completion of all of Virginia's planned Metrorail stations except one: Springfield/ Franconia. ICCA-IV covered construction of an 89-mile Metrorail system that could be completed with remaining funds authorized under the Federal Stark-Harris Act, plus associated local matching funds. ICCA-IV has subsequently been amended with a supplemental agreement setting forth contingency plans for completing segments of the system if Federal funds are not forthcoming or cost overruns occur. Funds for completion of the remaining portion of the Yellow Line, between Van Dorn and Franconia/Springfield stations, would have to be sought elsewhere (perhaps via a new Federal appropriation beyond Stark-Harris). NVTC is committed to seeking such additional funds for early completion of the Franconia/Springfield station (before 1991) from state and local sources, backed by an UMTA letter of no-prejudice. Approximately $80 million is required.

5. Transit and Ridesharing Implications of the Springfield Bypass, Washington Bypass, Beltway, I-66, I-95 and Route 28 Improvements

The Springfield Bypass is being started with $90 million of the proceeds from a Fairfax County bond issue. It will link Route 7 to the northwest with I-95 to the south, and the Franconia/Springfield Metrorail station to the southeast. As a result, access to that future station will be enhanced.

The Washington Bypass would connect I-95 in Prince William or Stafford County with I-70 in Maryland, via a new Potomac River bridge. This highway is only in the discussion stages now, although a Federal study on its feasibility has been completed.[1] The proposed highway would relieve y 5-13,000 daily vehicles from the American Legion Memorial Bridge (Cabin John), or about 3-11 percent. Thus, the new bypass would not create free-flowing traffic on the Beltway, nor induce existing transit users to return to their automobiles.

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[1] Virginia Western Bypass Study: Analysis of Future Traffic, FHWA (May 1986)

Proposed extensions of High-Occupancy-Vehicle lanes on I-66 west of the Beltway, and on I-95 south of the Beltway, may produce new opportunities for express bus connections. Currently, buses are trapped in the same bottlenecks as automobile drivers. On the other hand, projections for growth to the south and west suggest that future automobile traffic will swamp any planned capacity improvements. For example, population shifts to Spotsylvania County, Fredericksburg, Stafford County, and Prince William County will exceed local jobs, so that by the year 2005, as many as 15,000 new commuters may head north each day along I-95.[1]

6. New Metro Station Between Braddock Road and National Airport

Developers have proposed a major new complex to be built in Alexandria on land owned by the Richmond, Fredericksburg and Potomac Railroad, known as the X-38 package. To cope with the traffic such a development would bring, planners are studying the feasibility of a new Metrorail station contiguous to the site. The new station would be between the National Airport and Braddock Road stations on the Yellow Line. Metro's plans provided for a possible future station there.

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[1] 1980 census data used for projections, by the Tayloe Murphy Institute as reported in Public Transportation Needs Study for the Commonwealth of Virginia, ATE Management and Service Company, Inc. (1986).

The financial implications are quite complex, not only as to who would pay to construct the station (e.g. the developers), but also the effects on the subsidy sharing formulas used by Metro's jurisdictions. For tenants of the proposed new complex, however, and for neighboring residential areas, the concept of an extra Metrorail station has strong appeal.

V. IMPROVING INFORMATION

Above in Section III several problems pertaining to information were described, including a lack of a central telephone information service for the region, too few fare and schedule outlets, inadequate signs in and near transit stations, lack of coordinated marketing, and misunderstood relative costs as between autos and transit.

A. NVTC MARKETING PLAN

The Commission has identified improved marketing of public transit as one of its primary objectives. In December 1985 it adopted a formal marketing plan, with one-,two-, and five-year horizons. Twenty-nine specific activities were identified for implementation during the first year of the plan. The plan is being reviewed quarterly, and new plans will be formally adopted annually.

Broadly defined, marketing activities include:[1]

- Market Research: Includes on-board and telephone surveys, focus groups, emoloyer surveys, information request cards and coupons, liaison with community groups, and census data.

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[1] Transit Marketing: A Review of the State-of-the-Art and A Handbook of Current Practice, Cambridge Systematics, Inc. (April 1985) at 10 ff.

- o Service Development and Pricing: Transit passes, special events, fare free zones, employee development, subscription commuter service, transfer reciprocity, upgrading vehicles.
- o Consumer Information: Schedules, timetables, maps, brochures, bus stop signs, information displays, telephone inquiry response, trip planners, customer and tourist centers, community education, newsletters.
- o Public Relations: Press releases, media events, community service.
- o Advertising and Promotion: Newspapers, radio, cable and commercial T.V., outdoor posters, car cards, direct contact by mail or door-to-door visits, advertising trades, merchant discounts, short term reduced fares, anniversary celebrations, contests, merchandise give-aways.
- o Evaluation: Check results of above activities using statistically valid indicators.

Specifically, NVTC's 1986 Marketing Plan includes such activities as initiating media contacts for improved reporting of snow emergency transit routes, conducting a workshop on transit marketing techniques, conducting computer demonstrations at the annual meeting of the Virginia Association of Public Transit Officials, and carrying out an ambitious commuter rail marketing plan. Many of the other components of the Commission's 1986 Marketing Plan are described in succeeding sections.

For 1987 and beyond, NVTC has identified such activities as compiling accurate market share data (to facilitate establishing targets for transit), assembling an advisory committee of marketing experts and a transit users advisory group, sponsoring regional "Transpo" exhibitions that acquaint citizens with transportation choices, and work with employers to improve transit routes.

To market the Commission's proposed commuter rail service to prospective customers, several approaches are being followed, based on a plan that originally called for $35,000 in expenditures. Techniques included a map and schedule to be partially funded by advertisers, sales of caps, tee-shirts, whistles and other souveniers, and use of advertising supplements in local newspapers. A group called the "Friends of the Virginia Railway Express" has been organized, and is helping to spread the word about the service among citizens and elected officials. The group has supplied the names of several potential riders interested in serving as "Trainmeisters" (volunteer ticket-takers). Governor Baliles has announced his intention to seek an additional $125,000 annually for NVTC commuter rail marketing.

B. NVTC COOPERATIVE TELEPHONE INFORMATION PROJECT

Metro maintains a telephone information service with computerized fare, route and schedule information available to customers. It receives 2.75 million calls annually, of which about one in five is not answered. A 1984 survey by Metro revealed that half of the persons calling will take the trip about which they inquire. However, Metro information agents do

Figure 21

TELEPHONE INFORMATION NUMBERS

FOR NORTHERN VIRGINIA'S TRANSIT

PROVIDERS

SYSTEM	TELEPHONE
Alexandria DASH	370-DASH
AMTRAK	484-7540
Fairfax City CUE	385-7859
Fairfax Connector	339-7200
Greyhound	451-6322
Metro	637-7000
Trailways	273-7770 451-5800
Tysons Shuttle	524-3322

not dispense information about the many local and private systems which exchange passengers with the Metro system. Customers must telephone each such system separately to receive information provided by operators who manually consult schedules. Figure 21 lists many of these separate transit providers together with their information telephone numbers.

To remedy this problem, NVTC has applied for and received a Federal grant from UMTA. The Federal agency will supply $16,000, with $2,000 provided by VDH&T and $2,000 by NVTC. The grant funds will be used in 1986 to hire a consultant to assist in implementing a centralized regional telephone information number using Metro's existing system as a base. Among the issues to be addressed in the implementation study are: availability of computer capacity at Metro; incremental costs--if any--to the Metro system, and methods of assigning these to public and private participants; proper format for and schedule of data to be included; and the role of local versus Metro employees in coding data.

A central telephone information number, if combined with willing agents who are trained to sell transit service to customers, should provide a significant improvement in public information that will translate into ridership gains for all transit operators. NVTC's implementation project is designed to overcome the institutional inertia that has stymied such a worthwhile cooperative venture.

C. MARKETING INVENTORY

NVTC's computerized inventory was developed in 1984 and described in detail in the first report on the Bus Service Coordination Plan. By September 1986, the inventory contains 700 entries in a spread sheet format that can be sorted by transit property, techniques, or source. The data entries are short descriptions of marketing activities undertaken by transit systems around the world, with names of individuals to contact for further information.

This marketing tool permits rapid searches to be undertaken for useful ideas to use in such activities as opening ceremonies, special promotions, surveys, merchant give-aways, and reduced-fare programs. NVTC has used the inventory to help plan its commuter rail, Tysons Shuttle and SST taxi marketing efforts. The inventory has been shared with Metro and local governments, and is available to the public on request.

D. AUTO/TRANSIT COST MODEL

NVTC has developed and improved a computerized model that informs commuters of accurate costs due to using automobiles versus transit or ridesharing for trips to work. The model was described in the first report on the Bus Service Coordination Plan (see Appendix VI). Since that September 1985 description, however, the model has been updated and its output clarified. Further, the Commission has embarked on a campaign to alert citizens to the free cost comparisons that are available to them by contacting NVTC.

A one-page questionnaire has been developed which asks a commuter to list home and work address, model year of auto, and other information about the characteristics of his or her commuting options. If this information is not provided, NVTC's model fills in the blanks with appropriate regional averages. Persons seeking such an analysis receive a personalized one-page report of tables and graphs depicting the relative costs of auto versus transit (or ridesharing). A sample questionnaire, graphs, and other pertinent information are provided in Appendix E.

Using the model, startling results are sometimes obtained. For example, for an Arlington resident travelling from the Ballston area to Farragut Square, using a 1985 compact car, obtaining 20 miles per gallon, paying $3.50 daily in parking, and assigning only half of the ownership costs of the car to commuting, the auto driving costs (gas, tires, oil, and non-scheduled maintenance and expenses) are a modest $199 annually. This compares to annual bus-rail transit fares (using Metrobus 22G to Ballston and the Orange Line to Farragut West Station) of $460. However, considering car ownership costs and parking, transit becomes a better deal, since auto costs swell to $2,154 annually.

In many cases, of course, transit fares are not much greater than auto driving costs (e.g. a North Reston resident driving to the Pentagon in an intermediate-size car would pay $818 annually compared to $874 on Metrobus 5N), so that proper consideration of ownership, parking costs, and tolls tip the scales substantially in transit's favor (the Reston resident would pay $1,163 annually to drive even assuming free parking at the Pentagon).

E. REGIONAL TRANSIT MAP

Each transit property provides a system map for its patrons. Metro is updating a regional transit bus route map that it expects will be available by January, 1987. This map will include all public carriers in Northern Virginia (including local bus services) and will sell for $1.50.

F. TRANSIT FARE, SCHEDULE, AND INFORMATION OUTLETS

NVTC's first report on its Bus Service Coordination Plan included a detailed listing of such outlets, by jurisdiction (see Appendix II). Since last year, outlets are little changed, although there has been some shrinkage in the number of commercial establishments selling Metro fare media (20 were lost during FY 1986). To remedy the problem, the Metro Board approved a policy, on a trial basis, that permits sellers to levy a 25 cent surcharge per transaction. Fare media will still be available at Metro's own fare outlets at face value. The purpose of permitting the surcharge is to cover administrative expenses of firms choosing to handle such transactions. Metro has not yet determined the success of the program in terms of expanding outlets.

NVTC maintains a current list of outlets in Virginia that is available on request. Further, the Commission is actively working to expand the list by encouraging hotels and other businesses to make transit brochures, schedules, and fare media available to patrons.

G. METROPOOL PROGRAM AND EMPLOYER INITIATIVES

Metro has an ongoing program in which it visits employers to emphasize the benefits of Metro, and helps to set up an employee sales program. NVTC has urged that employers be provided discounts for bulk purchases of Metro fare media, but Metro staff have not concurred. The Commission believes it should be the responsibility of the employer to subsidize employee purchases, just as is often done for employee parking. The Arlington County government, for example, absorbs the cost of offering Metro farecards and bus passes to its employees at substantial discounts.

NVTC has contacted employers in connection with designing and marketing its demonstrations, and has directed employers to Metropool to encourage use of this service. NVTC will continue to provide Metropool referrals when opportunities arise.

H. TOURIST PASS

NVTC originated the concept of a tourist pass, in which a family would be able to purchase an inexpensive pass for unlimited rides on Metrorail on weekends. The Commission observed that tourists and families are discouraged from using Metrorail and Metrobus for group outings involving several stops, because of the minimum 80 cents per person per trip charge. The Metro Board finally approved the concept in 1984, and after repeated delays in implementation, the passes are now available (as of May 1986). Some Board members remain concerned about revenue "erosion"; they fear existing riders will use the passes to obtain discounts for trips

they would normally take at full fare. The Commission believes revenue from new riders should strongly outweigh any such revenue erosion. The dated passes are good for unlimited rides by groups of up to four persons. A packet of four personal farecards is sold for $5, up to ten days prior to the date on which the pass is to be used.

Metro's Office of Marketing sent a direct mailing to approximately 150 hotels encouraging them to become outlets for the pass. Throughout the Washington Area approximately 15 hotels now carry the pass. At present only three hotels in Virginia particpate as outlets: the Crystal Gateway Mariott, the Crystal City Mariott and Sheraton Inn in Tysons Corner. Apparently, the hotels are hesitant to publicize the tourist pass to the general public and instead offer it as part of a weekend package for guests. NVTC staff are undertaking a project to contact Virginia hotels to encourage expanded sales of the pass.

Tourist Pass brochures are located on Metrobuses and, in addition, rail station attendants are encouraged to make periodic announcements on Thursdays and Fridays about the pass. More needs to be done to publicize the passes, which are new and unfamiliar to most of the area's residents as well as tourists.

I. IMPROVED SIGNS

To improve a conspicuous absence of informative signs in and near Metrorail stations, Governor Baliles has asked VDH&T to work with Metro to identify locations requiring better highway signs. An example is the

approach to the West Falls Church Metrorail station parking lot, which requires motorists to pass under an electronic message sign warning of restricted access due to High-Occupancy Vehicle requirements. NVTC suggested that the message sign should be programmed to include a caveat that access to the Metrorail station was permitted. According to VDH&T, this is not feasible, but a stationary sign will be erected under the electronic sign.

At National Airport, although the Metrorail station is within walking distance and is served by a shuttle bus from the terminal, no visible signs alerted travelers to its proximity. In response to initiatives by a concerned citizen, four new back-lighted signs have been placed, with dimensions of 44 by 60 inches. A proposal to hang a banner on the Metrorail structure to be clearly visible from the airport was vetoed by Metro staff as being inconsistent with its architectural standards, but airline passengers can now follow trailblazer signs through the terminal to Metrorail.

J. NVTC ABSTRACTS FILE

Since transportation is the region's number one problem and no single jurisdiction or agency is charged with providing a solution, it is not surprising that studies on the subject have proliferated. As a service to planners, public officials, and concerned citizens, NVTC has initiated a computerized abstracts file of relevant transportation studies in the region. The file can be sorted by subject, author, or date, and is a useful resource to researchers that is available on request. Currently almost 200 abstracts have been entered.

K. CABLE-TV INITIATIVES

NVTC has been in contact with Media General cable company in Fairfax County to discuss the possibility of promoting various aspects of transportation in the Northern Virginia Region via cable.

The Transportation Channel (105) is currently an alpha-numeric channel; that is, only letters and numbers are displayed. However, the possibility of attaining full telecasting capacity in the future exists. It may be possible for NVTC to assist in programming for the entire transportation channel in the future. Initial information was sent to Media General on the Orange Line Opening including a map of the stations and roads leading into and out of the stations.

Staff is currently working on plans to market NVTC's auto/transit cost model. The proposed program would include three screens (each staying up for 15 seconds): an introduction to the personalized auto-cost model, a screen listing the information needed to generate the cost comparison, and finally who to contact. When viewers contact NVTC staff will then input the information in the computer and promptly send out the results.

Ideas for public service announcements emphasizing the benefits of transportation and for a call-in show featuring transportation issues are being discussed to possibly run on Media General's local programming channel #30. Successful programming ideas would be made available by NVTC to other media outlets.

Figure 22

PROMOTING METROBUS SERVICE ADJUSTMENTS

FREE METROBUS RIDES
June 23—June 27, 1986

Beginning June 23 Metrobus service is being re-routed and new service is being added throughout northern Virginia. Many Metrobus routes in Virginia will now provide convenient access to the new East Falls Church, West Falls Church, Dunn Loring and Vienna Orange Line Metrorail Stations!

The Ride's on Us.

To introduce you to the Metrobus routes making connections to any of the four new Orange Line Metrorail Stations, we're offering FREE trial rides.

For one week only from June 23 through June 27 you can ride any of the Metrobus routes listed FREE, during the morning rush hours. All you have to do is to BOARD THE BUS BEFORE 9:30 a.m. (After 9:30 the regular fare will be charged and since the ride is free no transfers will be issued.)

It's so easy. No coupon or ticket is necessary. No zone charges. And best of all, no more traffic jams, no more parking snarls. Here's your chance to free yourself from all the hassles of driving. For one week, Metrobus is FREE on these routes:

1B,D,V—serves Merrifield/Seven Corners/Arlington

2A,B,C,2P,W,X—Fair Oaks Mall/Oakton/Tysons Corner/Merrifield/Arlington

3A,B,D,E,3W,Z—Tysons Corner/West Park/Falls Church/Arlington

5A,B,C,D,E,F,G,H,J,5S,5Y—Reston/Herndon

10C—Alexandria/Arlington

12C—Centreville

20Y,Z—Chantilly/Greenbriar

22A,B—Walker Chapel/Cherrydale/Shirlington

23X—Great Falls/McLean

24E—Seven Corners/Williamsburg Blvd/Arlington/Pentagon

24T—McLean Hamlet

26T—Merrifield/Annandale/Springfield

28A,B—Alexandria/Southern Towers/Bailey's X'Roads/Falls Church

We'll Even Help you Plan Your Trip

To find the route that goes where you want to go, just give us a call at 637-7000. Metro Sales and Information Agents are available from 6:00 a.m. until 11:30 p.m. seven days a week to help you find the best routes, provide schedule information and answer all your questions.

L. METRO'S MARKETING PLAN FOR THE COMPLETION OF THE ORANGE LINE.

As mentioned, NVTC, Metro, member jurisdictions, and business and civic groups worked cooperatively to plan and implement opening ceremonies for the June 7, 1986 start of Metrorail service to four new Orange Line stations. NVTC requested from Metro's marketing office an explicit plan for marketing the rail opening and the associated bus service adjustments. The plan was provided on April 15, 1986. Its primary objectives were to create public awareness, inform potential riders of the changes, identify the benefits to them and attract riders to try the system and continue using it.

Metro's Office of Marketing conducted several initiatives to promote bus service changes along the Orange Line Corridor.

- o A direct mailing was delivered May 31 and June 2, 1986 to all residents within four blocks of Metrobus routes serving any of the new stations (approximately 156,000 households).
- o On June 4th Channel 7's "PM Magazine" highlighted the Orange Line Opening.
- o June 16-18, 98,000 - 100,000 mailings were targeted to specific bus routes, notifying residents of the service changes beginning June 23rd, and offering free rides until 9:30 a.m. each day that week. Figure 22 illustrates the free ride promotion.

- At the opening on June 7, information booths, staffed by Metro representatives, were set up at each station. A map of all Metrobus service at each station was displayed as well as brochures and timetables.
- Banners which were visible from major highways were attached to each new station.
- Arlington County and Fairfax County cable systems were sent information on the opening and the Metrobus changes.
- The Office of Planning conducted a tour of each of the four new stations with elderly and handicapped persons, as well as representatives of physical plant services.
- The Journal Newspapers published a special advertising supplement the week of June 2 that featured the new stations and Metrobus service.
- The week of June 2 print ads were placed in seven newspapers (the Washington Post, the three Journal newspapers, the Reston Connnection, the Northern Virginia Sun and the County Courier).
- Print ads were inserted into local newpapers featuring the Metrobus service changes during the week of June 17th - 20th. These ads were scattered throughout the week in the same seven publications.
- A two week radio schedule was obtained from six radio stations. The first week focused on the opening, at which each of the Metrorail stations had a radio station (East Falls Church - WCLY, Vienna - WXTR, West Falls Church - WXCR, and Dunn Loring - B106). The second week of radio spots concentrated on Metrobus changes.

- o Flyers were distributed at Ballston Metrorail station by Metro employees and NVTC staff, informing the public of free rides the week of June 23rd.
- o A public affairs program to introduce Metrorail and Metrobus to area schools involved a tour of the system by 400 school children.

The benefits of this extensive advertising campaign appear to have been realized in the strong ridership growth exhibited on the Orange Line extension. Metro planners originally anticipated 24,000 daily trips would be taken to and from the four new stations. This estimate was exceeded within two weeks of the station openings when ridership reached 28,000 daily trips. Approximately 30,000 daily trips were being made at these stations by the end of the first month of operations.

In addition, Fairfax City's CUE bus system provided free rides all during the month of June, 1986 to inaugurate its expanded system which serves the newly opened Vienna Metrorail station.

M. VANPOOL AND RIDESHARE SERVICES

NVTC continues to assist vanpool formation by providing interest-free loans of $1,000.00 that are scheduled for repayment over a one year period. NVTC has issued 25 loans since the program began in 1983 and the repayment record has been excellent.

Many vanpool operators are currently having trouble finding affordable insurance. 'This problem is not unique to vanpools but it is particularly difficult for the individual owner/operators who work on very small profit margins. The Virginia Vanpool Association -- a non-profit organization that promotes vanpooling -- is working with the representatives in the Virginia General Assembly to help resolve this problem.

The Metropolitan Washington Council of Governments operates a ridesharing program known as the Commuter Club. COG provides coordination and services for a network of government ridesharing programs including ridesharing offices in Fairfax County, Prince William County and Alexandria. The network assists commuters in forming carpools and vanpools by providing matchlists. Commuter Club network programs share computer resources and maintain a common database of applicants for the purpose of efficient and economical operations.

Ridesharing assistance in Virginia may be obtained from the following offices:

Areawide	Commuter Club Metropolitan Washington Council of Governments 1875 Eye Street, N.W. Washington, D.C. 20006 783-POOL (matching info) (202) 223-6800 (business)
Alexandria	Alexandria Ridesharing Service Office of Transit Services P.O. Box 178 City Hall Alexandria, VA 22313 (703) 838-3800

Fairfax County	Fairfax County RIDESOURCES Office of Transportation 10640 Page Avenue Fairfax, VA 22030 (703) 691-2323
Lord Fairfax Planning District: Clarke, Frederick, Page, Shenandoah, and Warren Cos.; City of Winchester; and Front Royal	Planning District Commission 103 East Sixth Street Front Royal, VA 22630 (703) 635-4146
Prince William County	Commuteride Prince William County 1 County Complex Court Prince William, VA 22192 (703) 335-6846 Eve. & Weekends: (703) 369-7665 From Washington: 631-1703 x 6846

VI. IMPROVING PERFORMANCE

In Section III, problems relating to transit system performance were highlighted. These include lack of integrated service, relatively high Metro costs, lack of current ridership information to assist in route planning, difficulty in obtaining adequate liability insurance, and lack of uniform performance standards. The following initiatives are designed to improve the economic performance of transit services.

A. NVTC'S RIDECHECK DATABASE

Metro conducts on-board ridership counts (ridechecks) according to a schedule that calls for every route to be sampled at least one day every two years. These on-board counts are to be supplemented with stationary counts (by a checker standing outside the vehicle) three times each year. In practice the counts are conducted less frequently.

The information derived from current and properly sampled ridership counts is absolutely essential to effective route planning.

Since WMATA does not automate its ridecheck data, NVTC embarked on a strenuous project to enter all of Metro's Northern Virginia ridership data

ROUTE 1B: EASTBOUND

WILSON BLVD LINE
RIDECHECK: September 1983

ROUTE SEGMENT BOUNDARIES

ORIGIN: ANNANDALE
DESTINATION: BALLSTON METRORAIL

A = Patriot Dr & Americana Dr to Hunners Rd & Residence #4218
B = Hunners Rd & Residence #4218 to Gallows Rd & Dolce Dr
C = Gallows Rd & Dolce Dr to Woodburn Rd & Gallows Rd
D = Woodburn Rd & Gallows Rd to Fairfax Hospital
E = Fairfax Hospital
F = on Gallows Rd : Hosp. Emgr Entr to Arlington Blvd
G = Arlington Blvd & Gallows Rd
H = on Alington Blvd: entr opp Melpar to Annandale Rd
I = Annandale Rd & Arl. Blvd to Hillwood Ave & Cherry St
J = on Hillwood Ave: Cherry St to Broad St (Rt 7)
K = Leesburg Pke to Sleepy Hollow Rd to 7-Corner SC
L = 7-Corner Shopping Center
M = Patrick Henry Dr & Greenwood Dr to Wilson Blvd & Mckinley St
N = Wilson Blvd & McKinley St to Wilson Blvd & Livingston St
O = Wilson Blvd & Livingston St to Ballston Metro Station

AVERAGE PAX

ROUTE SEGMENTS:	ANNANDALE origin	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	BALLSTON dest.
	Fairfax Co.											Fls Ch	Fairfax Co		Arlington Co.		
Segment Mileage	0.0	1.0	1.2	1.2	0.6	0.0	0.8	0.0	2.9	1.3	0.3	0.4	0.0	1.4	0.3	1.7	0.1
Cumulative Mileage	0.0	1.0	2.2	3.4	4.0	4.0	4.8	4.8	7.7	9.0	9.3	9.7	9.7	11.1	11.4	13.1	13.2
1st Bus to 9:30 am — AM Peak																	
On	0	1	0	1	0	2	0	1	7	3	1	0	1	6	2	3	0
Off	0	0	0	0	0	0	0	1	1	1	0	0	3	0	0	0	19
LV	0	1	1	2	2	3	3	3	9	11	12	12	9	14	16	19	0
Pax-Mile	0	0	1	1	1	0	2	0	9	12	3	5	0	13	4	27	1
9:30 am to 3:00 pm — Midday																	
On	0	2	0	1	0	1	0	0	5	2	1	0	4	5	0	2	0
Off	0	0	0	0	0	1	0	0	0	0	0	1	2	1	0	2	15
LV	0	2	2	3	3	3	3	3	8	10	11	10	11	15	15	15	0
Pax-Mile	0	0	2	2	2	0	2	0	10	10	3	4	0	16	5	25	1
3:00 pm to 6:30 pm — PM Peak																	
On	0	2	1	1	0	2	1	2	3	3	2	0	5	2	0	1	0
Off	0	0	0	0	0	0	0	0	1	0	0	0	4	2	0	2	13
LV	0	2	3	4	4	6	6	8	9	12	13	13	14	14	14	13	0
Pax-Mile	0	0	2	3	2	0	5	0	22	12	3	5	0	20	4	24	1
6:30 pm to 9:00 pm — 6:30-9 PM																	
On	0	2	0	0	0	2	0	1	1	1	1	0	1	3	0	1	0
Off	0	0	0	0	0	0	0	0	0	1	1	0	3	2	0	1	4
LV	0	2	2	2	2	4	4	4	5	5	5	5	3	4	4	4	0
Pax-Mile	0	0	2	2	1	0	3	0	12	6	1	2	0	4	1	7	0
9:00 pm to Last Bus — 9-Midnite																	
On	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Off	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pax-Mile	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
24 HOUR TOTAL — 24 Hr TOTAL																	
On	0	2	0	1	0	1	0	1	4	2	1	0	3	4	0	2	0
Off	0	0	0	0	0	0	0	0	1	0	0	0	3	1	0	1	14
LV	0	2	2	3	3	4	4	5	8	10	11	10	10	13	14	14	0
Pax-Mile	0	0	2	2	2	0	3	0	13	10	3	4	0	14	4	23	1

	Total Trips	Total Pax	Max Lv Load	Avg Pax/ Trip	Rev Miles/ Trip	Rev Hours/ Trip	Pax/ Rev Mile	Pax/ Rev Hour	Pax-Mile/ Trip	Pax-Mile/ Rev Mile	Pax-Mile/ Rev Hour
AM Peak	4	96	31	24.0	13.2	0.72	1.8	33.3	79.3	6.0	110.1
Midday	5	116	30	23.2	13.2	0.70	1.8	33.1	84.0	6.4	119.9
PM Peak	4	92	20	23.0	13.2	0.74	1.7	31.1	104.5	7.9	141.1
6:30-9 PM	2	19	5	9.5	13.2	0.72	0.7	13.2	40.5	3.1	56.3
9-Midnite	NA	0	0	NA	13.2	NA	NA	NA	NA	NA	NA
24 Hr TOTAL	15	323	31	21.5	13.2	0.72	1.6	29.9	82.4	6.2	114.4

Figure 23

into a computerized format that permits better access to the information and allows analysis of it. NVTC's methods were explained in the first report on the Bus Service Coordination Plan, in Appendix IV. Figure 23 provides a sample from NVTC's database, showing ridership for Metrobus Route 1B Eastbound by time of day and route segment.

NVTC has completed the database for all Virginia routes for which Metro has provided information. The Commission updates its files each time Metro provides information from a more recent count. The computerized data are used extensively by Northern Virginia's route planners, and are supplemented by counts provided by checkers employed by the jurisdictions. NVTC plans to expand its database to include these local counts for Metro and local routes.

Appendix F contains a listing of the routes available in NVTC's ridecheck database and the dates on which the data were collected. Many of the routes do not have current ridership data. In some cases, counts have been completed but not released to NVTC by Metro. In other cases, routes created to serve the newly opened Metrorail stations will not be surveyed until ridership patterns are more clearly established.

A plan "under testing" by Metro at this time would accelerate the ridechecking program to once every year. NVTC staff supports this expanded effort wholeheartedly. In addition, a proper sampling framework should be devised so that the ridecheck data accurately reflect average ridership, not the vagaries of the weather or traffic conditions on the single day of the ridecheck every two years.

NVTC has publicized the availability of its ridecheck analysis methods, and has supplied copies of the software to agencies and firms as distant as Holland.

B. PERFORMANCE MEASURES AND STANDARDS

To encourage efficient provision of transit service, it is essential to establish objectives for routes and to measure success relative to those standards. However, at least two issues arise: 1) What are the best measures? 2) Who should establish the standards?

In Northern Virginia, the Fairfax County Board has adopted an explicit procedure for evaluating route performance within its jurisdiction. NVTC's first report on its Bus Service Coordination Plan described the County's process, and detailed NVTC's computerized techniques for helping the County apply its process using NVTC ridership reports. (See page 95 and following). In essence, Fairfax County uses several indicators of performance for individual routes classified by type (local versus express) to rank them either excellent, very good, good, marginal or poor. The determinations are made by time of day (peak, midday, late evening, Saturday, Sunday) and are based solely on performance within the County, even if the route serves other jurisdictions. The ratings are used to highlight routes for further analysis using a more comprehensive evaluation process.

For routes that do serve more than one jurisdiction, a regionwide mechanism, consistent with that used by Fairfax County, might be useful. NVTC and the staff of its jurisdictions agreed to develop a regional performance measurement and rating mechanism (See Appendix V of the first BSCP report). However, in the meantime, Metro staff came forward with a plan to publish performance standards and measures.[1] Therefore it was appropriate for Northern Virginia to cooperate with the Metro effort rather than to develop a competing system.

Metro's service standards are of three types: 1) Productivity and efficiency; 2) Service design and market penetration; and 3) Service quality. It has made its plan public only for the first type. Nine indicators of service productivity are proposed, including passenger boardings per revenue-trip, boardings per platform-hour, peak hour maximum load factor, boardings per cost, constructed revenues per cost (including attributed transfer revenue), revenue-miles per platform-mile, revenue-hours per platform-hour, boardings per platform- mile, and boardings per peak period vehicle.

Metro's Office of Planning has developed minimum and maximum standards for its indicators and proposed three ranks of performance (low, medium, high) based on those ranges. Low productive service would warrant close examination for corrective action, but high productive service would also

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[1] "Metrobus Service Standards", Metro Office of Planning (July 14, 1986) DRAFT.

be examined for possible enhancement. (Metro's marketing office espouses the dictum "Don't ignore your stars".) The proposed standards would differ by jurisdiction, day of week, and type of service. Weights would be applied to the separate indicators to reflect Metro's assessment of their relative importance.

Unfortunately, Metro's initial proposal met with considerable criticism from some Board members and jurisdiction staff. Metro staff was asked to revise its approach by working with the jurisdictions to overcome some of these concerns:

- The key data on which the standards are based (ridership) are too old to be reliable and lack a statistically valid sampling plan;
- The measures are not reported by route or route segment, only by line (a collection of routes);
- Cost data would reflect average or unit cost rather than costs applicable to the particular route, time of day, or type of service in question;
- Passenger-miles should be computed and used as a measure (e.g. passenger-miles per employee hour). NVTC's ridership reports include this statistic.
- The standards should not be applied by Metro so as to conflict with local governments' desires for service within their jurisdictions.

At this stage, NVTC and local staffs are urging Metro to beef up its data collection and analysis capabilities before seeking to define and apply the standards. Although Metro staff argue that they lack the resources to compute a passenger-miles measure or to analyze data at the route level, many believe that the benefits from a detailed approach should outweigh any additional costs from more disaggregate analyses.

Metro publishes a quarterly report--with monthly supplements--on the performance of its rail and bus operations (also at the system as opposed to route level) known as Vital Signs. Indicators used include on-time performance and miles between road-calls which, if studied over time, can reveal trends in management performance. Standards have been set for these indicators by the Metro Board, although some jurisdiction staff are concerned that the standards do not provide sufficient information to permit improved management.

VDH&T is publishing an annual series of statewide transit performance indicators in an effort to build a database providing a five-year coverage. Volumes have been released for FY 1983 and 1984, and the report for FY 1985 is available in draft form. These indicators define system (as opposed to route) performance, but no standards are proposed by which to rank the relative performance of transit properties around the Commonwealth.

C. NVTC'S OPERATORS' COUNCIL

To facilitate sharing of operating information among persons who manage Northern Virginia's transit systems, NVTC has organized the Operators Council which meets periodically. Members share experiences pertaining to reliability of equipment and vendors, identify opportunities

to utilize maintainance and other facilites jointly, and actively pursue coordination projects. A recent initiative involved notifying local radio and television stations of transit operators' desires to provide prompt and accurate information on transit routes and services during snow emergencies. In turn, NVTC staff provided the operators with the names and telephone numbers of contact persons at the stations.

The Council has also discussed Metro's engine fluids analysis program, and shared information about sources of liability insurance. Metro's fluids analysis program has tested 27,000 samples since 1983, costing about $5 each. One in 400 samples reveals a critical problem; early repair saves the much greater expense of later engine overhauls. Fairfax County and Alexandria have similar testing programs, and Fairfax City is considering it. The Council also makes it easier for managers to communicate informally on such subjects as they conduct their day-to-day operations.

D. METROBUS USE OF DULLES ACCESS HIGHWAY

Metrobuses serving the Reston/Herndon area of Fairfax County used the Dulles Access Highway (owned by the Federal Aviation Administration) before the Dulles Toll Road was opened in late 1984. At that time, Metrobuses were physically unable to cross the Toll Road to reach the Access Highway, and were required to use the toll facility. Metro was able to persuade VDH&T to bill the Authority monthly for tolls, rather than requiring drivers to drop quarters into the toll slots. Nonetheless, lengthy queues at toll plazas have delayed Metrobus routes and hurt performance.

In August 1986 new slip ramps opened to permit Metrobuses to gain access to the toll-free and uncongested Access Highway via the Toll Road during certain hours. While this should significantly improve the performance of some Metrobus routes, VDH&T continues to seek payment of tolls from Metro at the same level as when the buses used the Toll Road to a greater extent (i.e. $80,000 annually). NVTC has opposed the collection of these tolls, and contacted the Governor asking for his assistance.

E. PRODUCTIVITY INVENTORY

Like the marketing inventory described above, NVTC also maintains a computerized inventory of money-saving and efficiency-enhancing transit programs from around the world. These are entered in a spreadsheet format, and can be sorted by property and type. The database is continuously updated and made available periodically to the Operators Council and local jurisdiction staffs.

F. INSURANCE

The nationwide liability insurance crisis has struck transit operators with a vengeance. Interestingly, the Metro system has been relatively immune. It has an excellent risk management program that is well-regarded by underwriters. Consequently, the Authority has received the coverage it sought at relatively reasonable premiums. Metro is self-insured up to $5 million, and buys commercial insurance above that level (up to $50 million) for an annual premium of $1.9 million.

In Fairfax County, the Connector has first dollar coverage up to $5 million, with a premium for the 33 buses of $381,000 for liability coverage and $84,500 for collision/comprehensive. This comprises a signficant share of the Connector's operating budget, despite the fact that no claims have been paid. Fairfax City's CUE bus system is insured under the City's policy and has been paying premiums of about $3,000 per bus. Alexandria saw its carrier go out of business, and had to pay almost twice as much ($140,000) for less coverage when a firm was finally located, despite a very favorable claims experience.

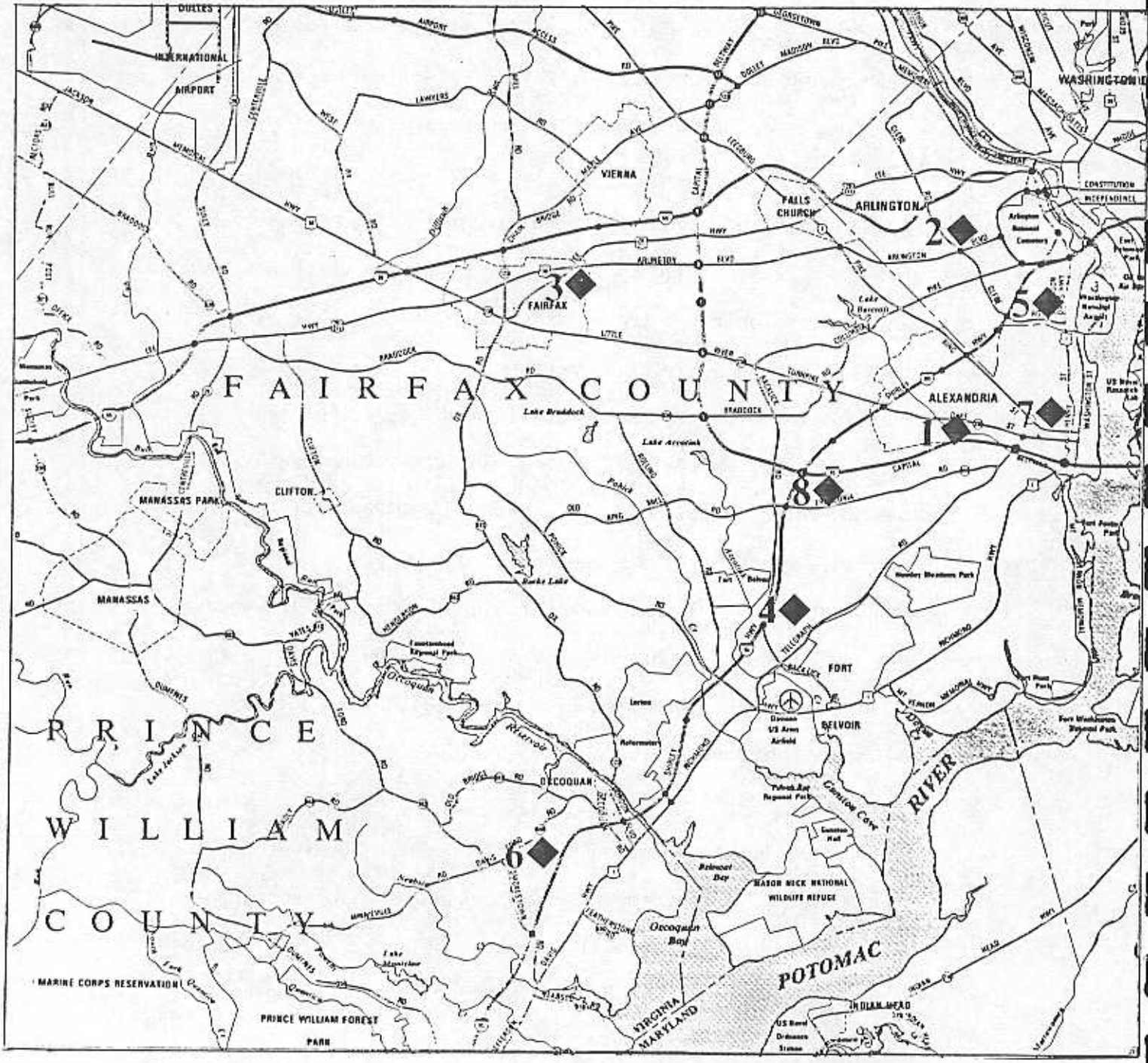
In Wisconsin, which serves as a model for the United States, small transit operators first joined to pool their insurance purchases, and then were forced to form their own transit insurance company. In Virginia, the General Assembly passed legislation permitting the Commonwealth to establish an insurance pool. The pool will probably not be available to offer protection until early 1987. In the meantime, the Virginia Association of Public Transit Officials has recommended that the State contribute $250,000 annually to help fund a reserve for transit self-insurance programs. A VAPTO committee chaired by the Alexandria Transit Company's General Manager is investigating opportunities for such a fund in Virginia. VDH&T has also hired a consultant to devise an appropriate state response to the crisis.

Perhaps nowhere has the insurance problem been so apparent as in NVTC's efforts to insure its commuter rail project. NVTC has not been able to purchase first dollar liability insurance up to $5 million to supplement excess coverage offered by AMTRAK for its Virginian.

FIGURE 24

BUS GARAGES IN NORTHERN VIRGINIA

1 Alexandria (DASH)
2 Arlington (WMATA)
3 Fairfax City (CUE)
4 Fairfax County (Fairfax Connector)
5 Four Mile Run (WMATA)
6 Prince William County
7 Royal Street (WMATA)
8 Springfield (WMATA-proposed)



Given such an unfavorable commmercial market, NVTC and particpating jurisdictions hired a consultant to devise a self-insurance program. The consultant suggested that about $1.5 million annually should protect against all claims, including a self-insurance reserve for claims of less than $5 million. This premium cost could be reduced to about $1 million annually if NVTC can be included in the railroads' excess coverage. The $1 million insurance cost would comprise about 10 percent of gross project costs, while established commuter railroads generally pay a smaller share of operating budgets for coverage. Clearly, any improvement in the severe crisis (that has significantly delayed NVTC's initiation of commuter rail service) would have a positive effect on the project budget.

Ultimately the costs of protection against claims are dependent on effective risk management. To help in that regard, Governor Baliles has ordered VDH&T to inspect grade crossings for safety on the RF&P and Norfolk Southern along the commuter route, and seek to remedy any perceived problems.

G. BUS GARAGES

Figure 24 shows the locations of Northern Virginia's bus garages. Metro has three garages. The Arlington County government has notified Metro that it will be developing the site of its garage. Similarly, Alexandria wishes to consider other uses for the Royal Street facility. Long range plans have been to close these two garages and construct a new building in the Springfield area, to serve in tandem with the existing Four-Mile Run Metrobus Garage.

NVTC staff have recommended that the Springfield garage, when and if constructed, should be scaled back to reflect the uncertain scope of future Metrobus service. The Commission has also requested that Metro staff investigate the benefits and costs of immediately closing the Royal Street facility in an effort to consolidate operations. Any savings in these fixed costs, would, of course, be weighed against possible increased dead-heading by buses (travel in non-revenue service to and from the routes).

The Metro Board has approved the construction of the Springfield Garage, and it is listed in the Authority's long-range capital plan. But, it is not funded, and given the trend to reduced reliance on Metrobus service by Fairfax County, the need for the facility in that location may eventually be reexamined. Arlington continues to press for closing of the Arlington Metrobus Garage due to a need to redevelop the land.

Fairfax County is constructing a bus garage and maintenance facility in Newington. Currently, the 33 Fairfax Connector buses are garaged in a County public works facility at 8101 Cinderbed Road in Lorton, Virginia, which is adjacent to the site of the new garage. Alexandria, which stores its 19 buses outside at a City public works facility south of Duke Street, must also construct a new garage, since its existing storage is at capacity with the addition of two new 35-foot buses early in 1986. The managers of DASH expect to seek funding for the new garage in about two years. Its location is undetermined.

Fairfax City, with a fleet of 8 buses stores them in a city facility located at 3410 Pickett Road and has plans for expansion to be used as a bus maintenance facility. Prince William County stores its 20-bus commuter fleet in a garage near Woodbridge, Virginia recently purchased from a previous operator.

Considering the locations of the facilities shown in Figure 24, there are no immediately obvious opportunities to combine facilities. Nonetheless, NVTC staff have recommended that Metro seek to cut costs, perhaps by developing its own engine overhaul facilities and offering to sell its services to other businesses. Alternatively, the Authority could utilize the services of the private sector (e.g. Greyhound has a major facility on New York Avenue in the District of Columbia).

VII. IMPROVING FINANCING

In Section III, financial problems plaguing the region were described. These include a Metro cost allocation process that encourages local governments to substitute their own transit service for that of the regional authority, substantial increases in future Metro rehabilitation costs and enormous needs for other improvements, uncertain NVTC fuel tax revenues and threatened cutbacks in Federal transit aid.

Most Northern Virginia citizens are undeniably well off economically. These jurisdictions have a 1986 median family income of $47,348, compared to a statewide average of $29,014. Fairfax County's median family income is $49,248 (the highest in the state), and Alexandria's is $39,541, with other NVTC jurisdictions within that range.[1] Yet, this wealth alone is insufficient to solve the region's enormous traffic problems, which are estimated to require over $3 billion in new construction by 2005.[2]

A. GOVERNOR'S COMMISSION ON TRANSPORTATION IN THE 21st CENTURY

Shortly after he took office in January 1986, Virginia Governor Gerald Baliles appointed a Commission to investigate future transportation needs and report by August 1986. The Commission was organized into three

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[1] Projected 1986 Median Family Income in Virginia's Counties, Cities, MSA's and Planning Districts, John L. Knapp and Robert W. Cox, Tayloe Murphy Institute (June 1986).

[2] "Northern Virginia's Transportation Facility Costs", G. Toni Giardini, COG (June 20, 1986).

subcommittees including critical needs, funding procedures, and finance. Hearings were conducted around the state, and surveys sent to every local unit of government to determine future highway needs.

NVTC's Chairman John Milliken spoke to the Governor's Commission regarding public transit needs, and called for the completion of the Metrorail system and a new commuter rail initiative, as well as new highways such as the Springfield and Washington Bypasses and Route 28 improvements. He emphasized that the Commonwealth must assume greater financial responsibility for transportation solutions in Northern Virginia.

While the Governor's initial plan called for a second phase of the Commission's work to be devoted to public transit, ports, airports, and railroad issues, it soon became apparent that the Commission was prepared to consider them during its initial phase.

A consultant commissioned by VDH&T (ATE Management and Service Company, Inc.) developed a methodology to predict statewide public transit needs, and based on these forecasts, VDH&T staff told the Critical Needs Subcommittee that transit capital needs over the next six years total $700 million in constant 1986 dollars (of which Northern Virginia comprises over $550 million). These estimates include NVTC's new commuter rail service and a new light-rail line in the Tidewater area. In addition, needs for state operating assistance (fuels, tires, maintenance) will total $1.5 billion in current dollars (1986 dollars inflated at 5.5 percent). Northern Virginia would need almost $950 million of this

amount. The amounts included for Metro in these estimates of statewide needs were taken from the 1986 Federal City Council study described in detail below.

These transit needs, although significant, are dwarfed by critical highway construction needs of over $10 billion in the next ten years (plus another $10 billion over a 20-year planning horizon). The subcommittees considering finance and funding mechanisms wrestled with such alternatives as bonds, income tax increases, and new sales tax levies, before proposing the final funding package. This consists of a combination of a three-quarters of one percent increase in the state sales tax, a four cents per gallon increase in the state tax on gasoline, and an increase of two percent in the state vehicle titling tax. The Commission's recommendations are consistent with a doubling of the funds provided to support public transit throughout the Commonwealth.

The General Assembly will meet in special session September 15, 1986 to consider the recommendations of the Commission.

The Governor's Commission considered such additional transportation mechanisms as toll finance and special transportation districts that would assess developers to help construct and maintain new transportation facilities. A federally financed study conducted by George Mason University has recommended a regional trust fund be established to close the $3 billion regional gap between needed highway and transit construction and available financial resources in Northern Virginia. Transit needs comprise over 10 percent of the total. The trust fund would

pool revenue from a variety of sources under the auspices of a financial management group. The study recommended that the state fund a third of the total using general obligation and revenue bonds; local governments would fund a quarter using general revenues and general obligation bonds; a half-cent regional sales tax would fund a third; the private sector would fund a twelfth using proffers or impact fees, and tolls would fund the remainder.[1]

B. METRO BUDGET PROCESS

Metro's approved FY 1987 budget calls for regionwide local subsidies of almost $230 million. The adopted budget concludes a process stretching over several months. Each year a staff group reviews the budget proposed by the General Manager and helps the region's Chief Administrative Officers and the Metro Board evaluate it. Often significant cost savings are recommended.

For FY 1988, the Metro Board adopted stringent guidelines calling for operating costs to be increased by 3 percent or less. NVTC staff, which have chaired the CAO budget review in several previous years, believe the Board guidelines are important for a successful budget process.

Revenue for FY 1987 is now believed to be significantly greater than forecast at the time the budget was adopted. The Board has called for the extra revenue to be reserved for return to the jurisdictions.

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[1] "Closing the Gap: Alternatives for Funding Transportation," George Mason University (June 21, 1986) at 5.

Figure 25

USES AND SOURCES OF FUNDS

TO SUPPORT METRORAIL AND

BUS OPERATIONS, CAPITAL AND CONSTRUCTION

PROGRAMS IN NORTHERN VIRGINIA

(FY 1984-1987)

--$Millions--

	FY 1984	FY 1985	FY 1986	FY 1987
USES OF FUNDS				
Operating Costs				
Bus	$ 57.1	$ 60.7	$ 60.7	$ 61.9
Rail	38.0	42.3	47.8	61.7
Subtotal	95.1	103.1	108.5	123.6
Debt Service	7.5	7.5	7.5	7.5
Capital Costs				
Bus and Rail	21.9	16.6	23.2	11.4
Rail Construction	108.0	121.6	88.8	86.2
Total Uses	$232.5	$248.7	$228.0	$228.7
SOURCES OF FUNDS				
Operating Revenues				
Bus	$ 19.2	$ 20.7	$ 18.8	$ 18.2
Rail	23.3	29.9	31.2	41.4
Subtotal	42.5	50.6	50.0	59.6
Federal Grants				
Capital	17.0	8.0	13.4	9.1
Operating	4.8	4.8	4.8	4.8
Stark-Harris	86.4	97.3	70.8	69.0
State Aid	21.1	20.6	21.1	22.7
Regional Motor Fuels Tax	9.7	9.8	9.8	8.2
Local	51.0	57.6	58.1	55.3
Total Sources	$232.5	$248.7	$228.0	$228.7

C. REVISED ALLOCATION PROCESSES

The processes by which WMATA allocates its Metrobus costs and revenues, and Metrorail subsidies, to jurisdictions are described in NVTC's 1986 Handbook (page 39 and following). Metrobus recovers about three-eighths of its operating costs from the farebox, systemwide (less in Virginia) while Metrorail recovers over two-thirds. The shortfall must be assessed to member jurisdictions using formulas.

NVTC receives state and Federal aid and allocates it to member jurisdictions, also using formulas. This outside assistance partially offsets the required Metro subsidies. As shown in Figure 25, local governments in this region provided almost $60 million in local funds to support transit since FY 1985.

Given these significant costs, it is not surprising that the methods used to allocate subsidies and financial aid among jurisdictions should come under close scrutiny.

1. Metro's Task Force on Fares and Formula Allocation and Proposed New Study of Allocation Methods.

In 1984, the Metro Board created a task force to recommend improvements in its Metrorail subsidy allocation process. The current formula uses a three-part formula (stations, population, and ridership by jurisdiction). Among the strongest recommendations of the task force was a call to create an incentive in the formula for jurisdictions that boost

ridership. The Metro Board did not enact such a change, however, and by early 1986 called for a consultant study of revised bus and rail allocation formulas.

Fixed bus costs are now allocated to Virginia based on the proportion of 1975 buses, but within Virginia, NVTC has chosen to allocate fixed costs using relative shares of bus miles and hours. Bus miles and hours are also used to allocate variable costs. Bus revenues are allocated separately, based on annual ridership surveys. Because of the existence of fixed bus costs, a jurisdiction reducing Metrobus service receives a bonus at the expense of other jurisdictions, since it is credited with greater cost savings than accrue to the system.

Three major allocation issues to be dealt with in the proposed study are:

1) A Metrorail ridership incentive;
2) A bus/rail transfer allocation mechanism that would reduce the current penalty to revenues earned by the bus mode when passengers use Metrorail transfers; and
3) A revision of the bus formula to neutralize the existing incentive to discontinue Metrobus service. (Note that legitimate cost savings due to lower local wage rates and more flexible management should not be neutralized.)

2. Proposals to Streamline State and Local Allocations

In mid-1986, the Virginia Highways and Transportation Board approved a new method of allocating state aid for public transit. Whereas

previously, historic levels of aid approved by the General Assembly were used as the basis for distribution, the Board voted to overturn that precedent and use a new method that weighs capital needs more heavily. The impetus for the change was an additional $3.25 million in annual state aid provided by the General Assembly for bus capital needs. The Board chose a new distribution method that reallocated all $35 million in annual state aid, not only the incremental $3.25 million.

Although NVTC's annual allocation would increase from $20.8 million to $22.7 million under VDH&T's method, an arbitrary provision of the formula penalizes NVTC in the amount of $5.7 million. All other transit properties statewide gain at NVTC's expense. Thus, NVTC continues to oppose the new method. However, with the possible infusion of new state aid as a result of the special legislative session in September, it is likely that a new formula will be developed and perhaps written into the statutes.

NVTC itself must distribute among its members the roughly $35 million annually it receives from state aid ($22.7 million), Federal operating assistance ($4.8 million), and a regional two percent motor fuels tax (previously $9.8 million, but with the drop in fuel prices, perhaps in future years only $8.0 million). To do so, the Commission uses a formula that assigns a 75 percent weight to relative operating subsidies and a 25 percent weight to operating costs. This formula was adopted in FY 1984 and will expire at the end of FY 1987.

Fairfax County has expressed its strong concern that the existing NVTC formula is unfair since it does not return motor fuel tax revenues to the jurisdictions in which the taxes are collected. Presumably this will be an issue of contention when the Commission takes up the formula again at its March 1987 meeting.

D. STUDY OF METRO IMPACT ON THE VIRGINIA ECONOMY

Partially in response to a serious challenge to Metro funding posed by down-state members of the General Assembly in February 1985, several Northern Virginia businesses financed a detailed examination of the benefits to the Commonwealth of the Metro system.[1] The November 1985 report showed that the Commonwealth's investment in Metrorail has paid healthy dividends, and should continue to do so.

For example, Metrorail will generate $660 million in additional state tax revenue by 1995. The state will have contributed only $376 million by that date. This represents an internal rate of return of 13 percent. Permanent employment will grow by 29,000 office jobs, 3,000 retailing jobs, and 2,000 hotel jobs. About 2,400 construction jobs were created each year. New development projects will be induced totaling 14 million square feet of office space, 1.7 million square feet of retail space, 2,300 additional hotel rooms, and 8,800 additional residential units. Only currently approved developments were included in the study.

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[1] Fiscal Impact of Metro on the Commonwealth of Virginia. Peat Marwick Mitchell and Co. (November 1985).

E. FEDERAL CITY COUNCIL STUDY

The Federal City Council initiated a major study of Metro finances using grants from the Urban Mass Transportation Administration and utilizing consultants from Peat Marwick Mitchell, COG, and the Greater Washington Research Center.[1] The study was released on March 11, 1986. The original purpose of the study was to develop a set of objective projections of future Metro costs, revenues, and ridership that could be widely used in debating the future of WMATA. Also, the ability of local jurisdictions to pay the subsidies was to be determined. It appears that the study met this objective, since a blue ribbon committee composed of business and government leaders guided it, and a technical committee of local, regional, state, and Federal staff worked carefully with the consultants.

In general, the report provides good news for Metro and its jurisdictions. Operating and maintenance costs were projected to remain relatively stable (in constant 1986 dollars) over the next 15 years. While patronage projections are lower that those made during the early 1970's (due to lower-than-expected population growth), ridership and passenger revenue will grow substantially. Indeed, these ridership forecasts appear to be conservative, since a surge following extension of the Orange Line in June 1986 has put actual Metro ridership ahead of that

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[1] Transit in the Nation's Capital: What Lies Ahead? Federal City Council (February 1986).

assumed by the consultant. Trips made entirely by Metrobus were projected to decrease by 33,000 daily trips by the year 2000, while local transit ridership should grow by 5,400 daily trips. The net effect is that local operating subsidies should remain a modest share of local operating budgets (less that three percent), even if Federal operating assistance is eliminated.

On the other hand, the study explicitly identified almost $160 million annually by the year 2000 (in constant 1986 dollars) for rehabilitation that had not been publicly recognized. Only $42 million annually is spent for that purpose today.

For rail construction, a great deal depends on whether Federal funds will be available after Stark-Harris appropriations are spent. Even with a new Federal appropriation to complete the 103-mile system, local governments can expect to pay an additional $481 million.

Peat, Marwick, Mitchell provided its spreadsheet Metro budget model used in the Federal City Council study to NVTC. Staff have upgraded it for analysis of future Metro budgets.

Key findings of the Federal City Council Metro Financing Study indicate that by the end of the century, WMATA transit operating assistance payments, on either a gross or net basis, will represent about the same percentage of the local governments' total operating expenditures as they do today.

By the end of the century, assuming that the full 103-mile Metrorail system is in revenue service, Metrorail operating and maintenance costs are projected to be approximately $292 million, in 1986 constant dollars. By comparision, Metrorail costs for the Fiscal Year 1986 are expected to be approximately $189 million.

In addition, the study indicated that Metrobus operating and maintenance costs, as expressed in 1986 dollars, will remain relatively stable over the next 15 years -- at about $230 million. Thus, in constant 1986 dollars, combined Metrobus and Metrorail operating and maintenance costs are projected to increase from roughly $422 million this year to approximately $525 million by the Year 2000, a 24% increase.

For the combined WMATA rail and bus system, the annual requirement for rehabilitation and replacement capital funds is projected to rise from $41.8 million in 1986 to $157.5 million by the year 2000, in 1986 constant dollars. Of that $157 million in the year 2000, bus capital needs will only amount to $24.7 million, while rail equipment and rail facilities will total $132.8 million.

The study had one overriding conclusion: the Metro System will be faced with a large and increasing bill for capital rehabilitation and replacement in the very near future. The study also played an important role in assembling technical experts and political leaders to agree on the scope of the problem. The next step will be to devise a cooperative means to resolve it.

F. POTOMAC-RAPPAHANNOCK TRANSPORTATION COMMISSION

NVTC engaged in active discussions for several months during 1985 regarding the opportunities for neighboring jurisdictions such as Prince William County to join the Commission. In addition to improved communications and an expanded forum for regional problem-solving, such a move seemed to offer new members an automatic revenue source for public transit improvements (the two percent regional motor fuels tax). This revenue appeared to be critical to the success of NVTC's commuter rail project. The General Assembly did enact amendments to the Transportation District Act of 1964 and the statutes defining the regional tax to permit a new transportation district commission to be formed by NVTC's neighbors. Consequently, Prince William County, Stafford County, and Manassas joined together to create the Potomac-Rappahannock Transportation District.

Revenues from the two percent motor fuels tax in the new district are expected to range from $1.35 million to $2 million per year and will be returned to members based on the point of sale. The funds will support public transportation projects such as commuter rail, commuter bus, and park-and-ride lots.

G. NVTC FINANCE AND ALLOCATIONS MODELS

To facilitate analysis of financing issues, NVTC maintains spreadsheet models that permit tests of alternative assumptions regarding tax yields, transit costs, state and Federal aid, and allocation formulas. For example, FY 1987 local subsidy requirements were computed for each NVTC

jurisdiction using two assumptions regarding motor fuel tax yields. The results are shown below, and illustrate that local budgets can be quite sensitive to the seemingly favorable development of reduced gasoline prices. Figures are expressed in millions of dollars:

	City of Alexandria	Arlington County	Fairfax City	Fairfax County	Falls Church City
Subsidy with current gas tax ($9.8 million)	$9.72	13.09	0.69	30.75	0.44
Subsidy with reduced gas tax ($6.0 million)	$10.40	14.10	0.72	33.49	0.47

H. RELATIVE FINANCIAL EFFORT TO FUND TRANSPORTATION

As mentioned above, funding requirements for transportation needs loom large in the future. To determine the extent to which local governments devote financial resources to transportation, operating budgets of each of the five NVTC member jurisdictions were compared over a three-year period. To the extent possible, common assumptions were applied. Demographic, physical, and financial characteristics were closely examined and identified. Numerous sources were used including local and state agencies, governmental publications, as well as the local budgets for each jurisdiction. The result was a "Transportation Operating Statement" showing for each jurisdiction and the region as a whole the funds available to support transportation, and the amounts spent each year on such categories as highways, streets and sidewalks (including street lighting) in addition to transit. For FY 1984, total transportation spending in the region was over $135 million. Comparative values of

Figure 26

CATEGORIES OF INFORMATION IN NVTC'S
TRANSPORTATION OPERATING STATEMENT
DATABASE BY JURISDICTION

Categories of Funds Available

NVTC Aid
State Revenue
Local Revenue

Categories of Operating Expenditures

Highways, Streets, Sidewalks
Street Maintenance
Traffic Signs and Signals
Street and Road Cleaning
Transportation
Street Lighting
Office of Transit Services
WMATA
Local Transit
Maintenance and Construction
Road Program Management
Transportation Debt Service
Pay-As-You-Go Capital

Categories of Financial, Demographic, and Transit Data

Total Budgets
Assessed Real Property
Assessed Residential Property
Assessed Commercial Property
Population
Square Miles
Employment
Registered Autos
Lane Miles of Highway
Annual Transit Ridership

assessments for property were also compiled, together with populations, square miles, employed residents, registered automobiles, and other such measures. The data which were gathered will provide a valuable resource for researching the transportation contributions of each of the five member jurisdictions. Figure 26 shows the categories.

I. MOBILIZING PRIVATE RESOURCES

Current patterns of development around Metrorail stations often do not provide direct access for pedestrians (i.e. one project cuts off the access of another). This forces persons to use autos to reach the stations. Proffers (developer offers to provide land or services in exchange for permission to alter zoning restrictions) are being increasingly sought to help finance highway improvements, but the same logic should apply to transit and pedestrian access. A Metro site planner illustrates the sharp impact on Metro revenues from increasing its mode share near major development sites. He suggests that an increase from the typical 2.5 percent transit share to 10 percent (e.g. a site with 6.0 million square feet of development) would increase annual transit revenues at such a site to $2.4 million from $600,000.[1] The stakes are large.

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[1] "Metro: Shaping the Region." Presentation by Lee Skillman to American Planning Association, Washington, D.C. (January, 1986).

In Alexandria, several developers have agreed to buy additional DASH buses and/or pay for DASH service, while developers of the X-38 site on the RF&P right-of-way appear amenable to considering building a new Metrorail station, although the extent of their financial participation is still at issue.

Fairfax County has asked the Virginia General Assembly for authority to create a special district to fund Route 28 improvements near Dulles Airport.

In Arlington, the sharp escalation of property values adjacent to Metrorail lines has provided a strong funding base. Assessments have tripled since Metrorail opened, providing local funding for the transit system while permitting a reduction in tax rates on property and business.

Northern Virginia's neighbors are also working to mobilize public and private resources to cope with development-induced congestion. In Montgomery County, Maryland, for example, the Council has been asked to consider major new transit and highway initiatives (such as public incentives for employee vanpools, more flex-time, shuttle buses to Metrorail stations, more Ride-On and Metrobus routes, discount rail and bus passes for employees in congested areas), to be funded by property taxes, impact fees on new development, and special tax districts.

VIII. CONCLUSION

This second annual report describing NVTC's Bus Service Coordination Plan has identified problems in transit connections, consumer information, service performance, and finance. It has also explained the cooperative efforts of the Commission, its member jurisdictions, Metro, and other public agencies, citizen groups and private firms to cope with the severe congestion and accelerating costs inherent in this rapidly growing region. In the past, many of these efforts have been short-term attempts to keep the situation from deteriorating further. Increasingly, however, longer term solutions are being identified, and implemented. The recommendations of the Governors Commission on Transportation in the 21st Century is a case in point, as that group called for substantial statewide tax increases to fund needed highway and transit improvements on a coninuing basis.

During the next year, the Commission's planning process will turn its attention to more effective transit marketing, assimilating whatever additional financial resources are provided by the General Assembly, and considering the renewal of the formula by which NVTC shares its transit assistance.

Service-related trends for bus operations that must be evaluated include the continued adjustments of Metro's line-haul bus routes to become feeders for Metrorail and to provide more effective non-radial connections, and substitution of local and private contract bus services for routes served by Metro. On the rail side, important trends include the

major role that Metro plays in encouraging and shaping development (with competing forces arguing both for more and less intense development), constrained access to stations due to congestion and lack of parking capacity, efforts to provide efficient and convenient bus access to Metrorail stations and jobs in competition with the private automobile, and the struggle to initiate commuter rail service. Financially, short-term prospects are bright, with cost-recovery improving; Federal appropriations for construction, capital and operations continuing at substantial levels; and sharply increased state assistance a strong likelihood. Longer term financial prospects are more problematic however, with capital replacement and rehabilitation needs for the Metrorail system posing a growing liability to which attention should be devoted now.

APPENDIX A

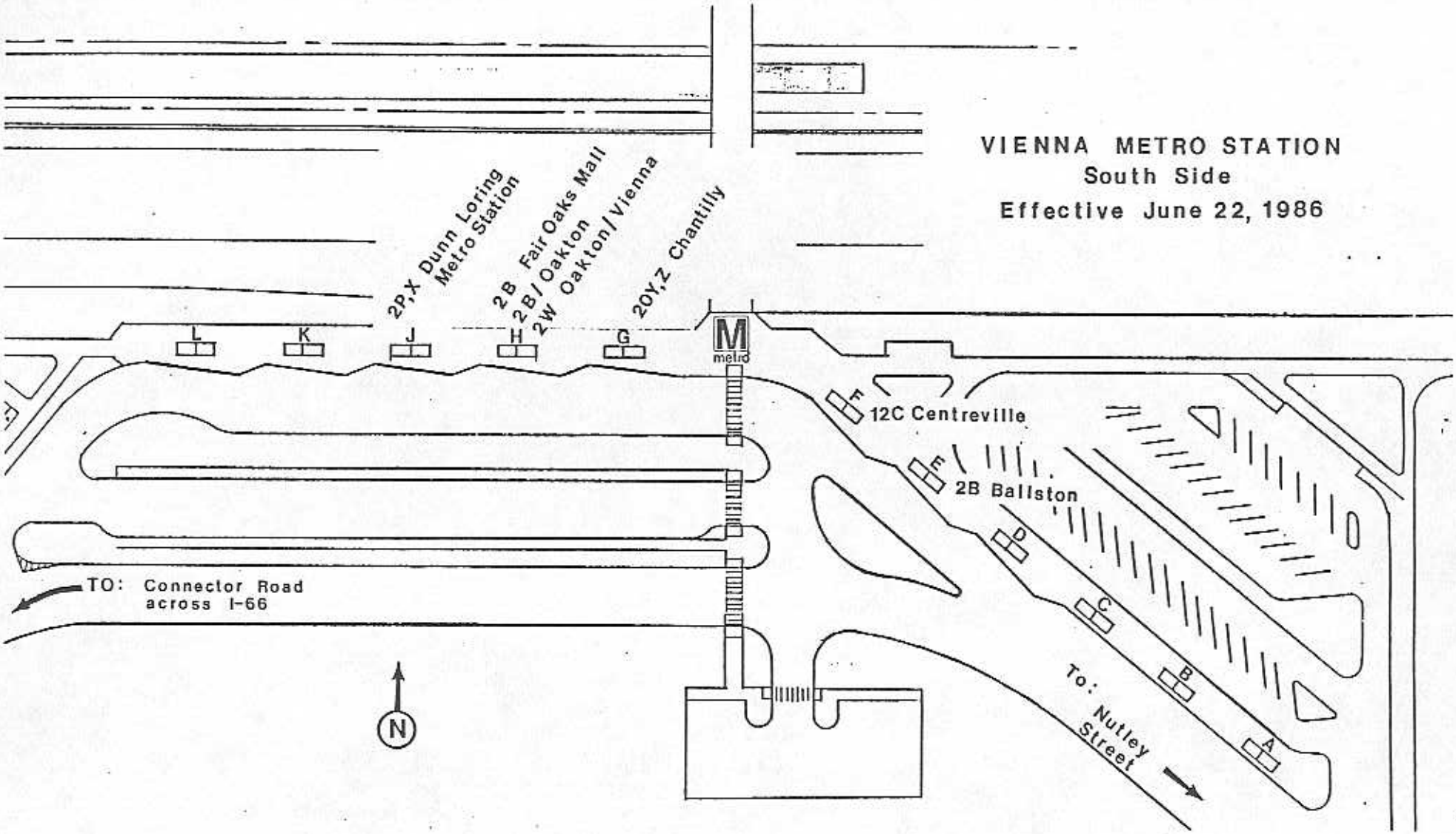
NORTHERN VIRGINIA METROBUS ROUTES AND MAJOR TRANSFER LOCATIONS

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
METROBUS
DIVISION - LINE NAME - ROUTE NUMBERS
EFFECTIVE: JUNE 22, 1986

SDBS LINE NUMBER	DIVISIONS PRIMARY-OTHER	LINE NAME	ROUTE NUMBER	ROUTE NUMBER WEEKDAY BASE SERVICE	ROUTE NUMBERS SATURDAY	ROUTE NUMBERS SUNDAY
137	Arlington-Four Mile	Wilson Blvd-Fairfax	1B,C,D,E,F,G,V,Z	1B,C,D,F	1B,D,F	1E,F
126	Arlington-Four Mile	Washington Blvd	2A,B,C	2A,B,C	2A,B,C	2A,C
124	Arlington	Vienna-Oakton	2W,P,X	-	-	-
69	Arlington-Four Mile	Lee Highway	3A,B,C,E	3A,B,E	3A,B,E	3A,C,E
119	Arlington	Westpark-West Falls Church	3W,Z	-	-	-
94	Arlington-Four Mile	Pershing Dr-Arlington Blvd	4A,B,E,H,S	4B,H	4B,E,H	4B,E,H
130	Arlington	Culmore-Ballston	4C	-	-	-
100	Arlington	Reston North	5A,B,J	-	-	-
138	Arlington	Reston South	5C,D,E,F,G,H	-	-	-
143	Arlington-Four Mile	Reston Crystal City	5N,P	-	-	-
23	Arlington-Four Mile	Herndon-West Falls Church	5S	5S	5S	5S
62	Arlington	Herndon Express	5Y	-	-	-
92	Four Mile	Bradlee-South Fairlington	6A,D,F,G	6A	6A	6A
70	Four Mile	Lincolnia-North Fairlington	7A,C,E,F,H,P,W,X	7A,F	7A,F	7F
106	Four Mile	Foxchase-Seminary Valley	8W,X,Z	-	-	-

SDBS LINE NUMBER	DIVISIONS PRIMARY-OTHER	LINE NAME	ROUTE NUMBER	ROUTE NUMBER WEEKDAY BASE SERVICE	ROUTE NUMBERS SATURDAY	ROUTE NUMBERS SUNDAY
48	Four Mile	Fort Belvoir-Pentagon	9A,E	9A	9A	9A
2	Royal-Four Mile	Alexandria-Arlington-Pentagon	10A,B,C,E	10A,B	10A,B	10A,B
83	Royal-Four Mile	Mount Vernon	11H,P,X,Y	11P	11H	11H
139	Arlington	Centreville Express	12C	-	-	-
39	Four Mile	National Airport-Pentagon-Washington	13A,B,C,D,F,G	13A,B	13A,B,F,G	13A,B,F,G
27	Arlington	Chain Bridge Road	15K,L,M	15K	-	-
31	Four Mile-Arlington	Columbia Pike	16A,B,C,D,E,F,L	16A,B,C,D	16C,E	16C,E
107	Four Mile	Shirlington-Pentagon	16U,W,X	-	-	-
66	Four Mile-Royal	Kings Park	17A,B,F,G,H,K,L,M	17A	-	-
116	Four Mile-Royal	Springfield	18A,B,D,E,F	18B	-	-
87	Four Mile-Royal	Orange Hunt-Burke Centre	18G,H,J,K,L,P,R	-	-	-
542	Four Mile	Lorton Express	19L	-	-	-
60	Arlington	Chantilly-Greenbriar	20Y,Z	-	-	-
68	Four Mile	Landmark Express	21A,B,F	-	-	-
125	Arlington	Walker Chapel-Shirlington	22A,B,F	22B	-	-

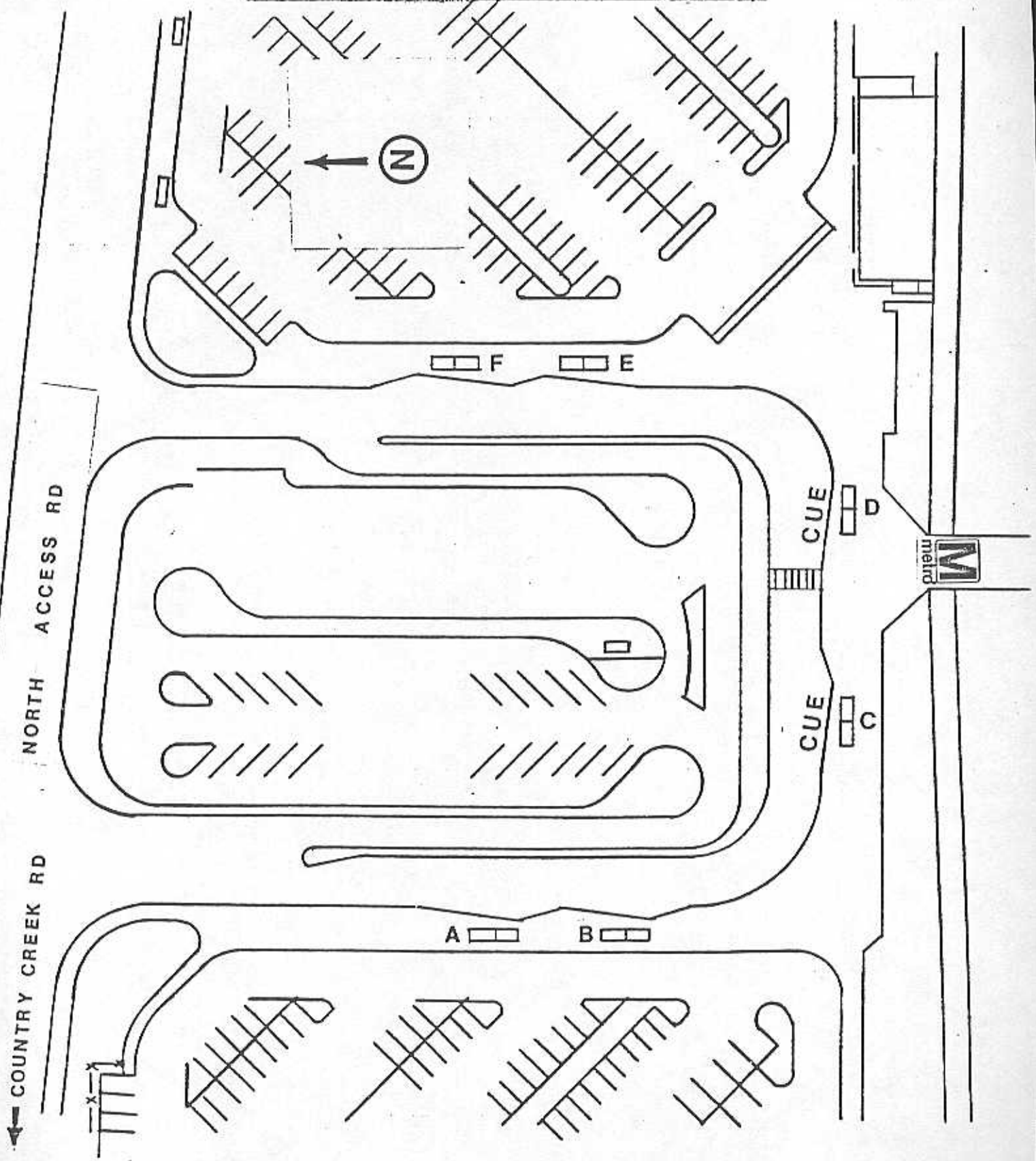
SDBS LINE NUMBER	DIVISIONS PRIMARY-OTHER	LINE NAME	ROUTE NUMBER	ROUTE NUMBER WEEKDAY BASE SERVICE	ROUTE NUMBERS SATURDAY	ROUTE NUMBERS SUNDAY
54	Four Mile-Arlington	McLean-Cyrstal City	23A,C,T	23A,T	23T	23T
57	Arlington	Great Falls	23X	-	-	-
120	Arlington-Four Mile	Seven Corners-Pentagon	24E	24E	24E	-
140	Arlington	McLean Hamlet-East Falls Church	24T	-	-	-
3	Arlington-Four Mile	Landmark-Ballston	25A,B	25A,B	25B	-
121	Four Mile	Tysons Corner-Springfield Mall	26T	26T	26T	-
61	Royal	Franconia -Pentagon	27B,C	-	-	-
82	Royal	Hayfield-Pentagon	27G	-	-	-
104	Four Mile	Saratoga	27Y,Z	-	-	-
5	Royal-Four Mile	Alexandria-Tysons Corner	28A,B	28A,B	28A,B	28B
110	Four Mile	Skyline City	28F,G	-	-	-
8	Four Mile-Royal	Annandale	29B,C,E,F,G,H,X	-	-	-
4	Royal-Four Mile	Alexandria-Fairfax	29K,L,M,N	29K,L	29M,N	29M
12	Arlington-Four Mile	Ballston-Farragut Square	38B	38B	38B	38B

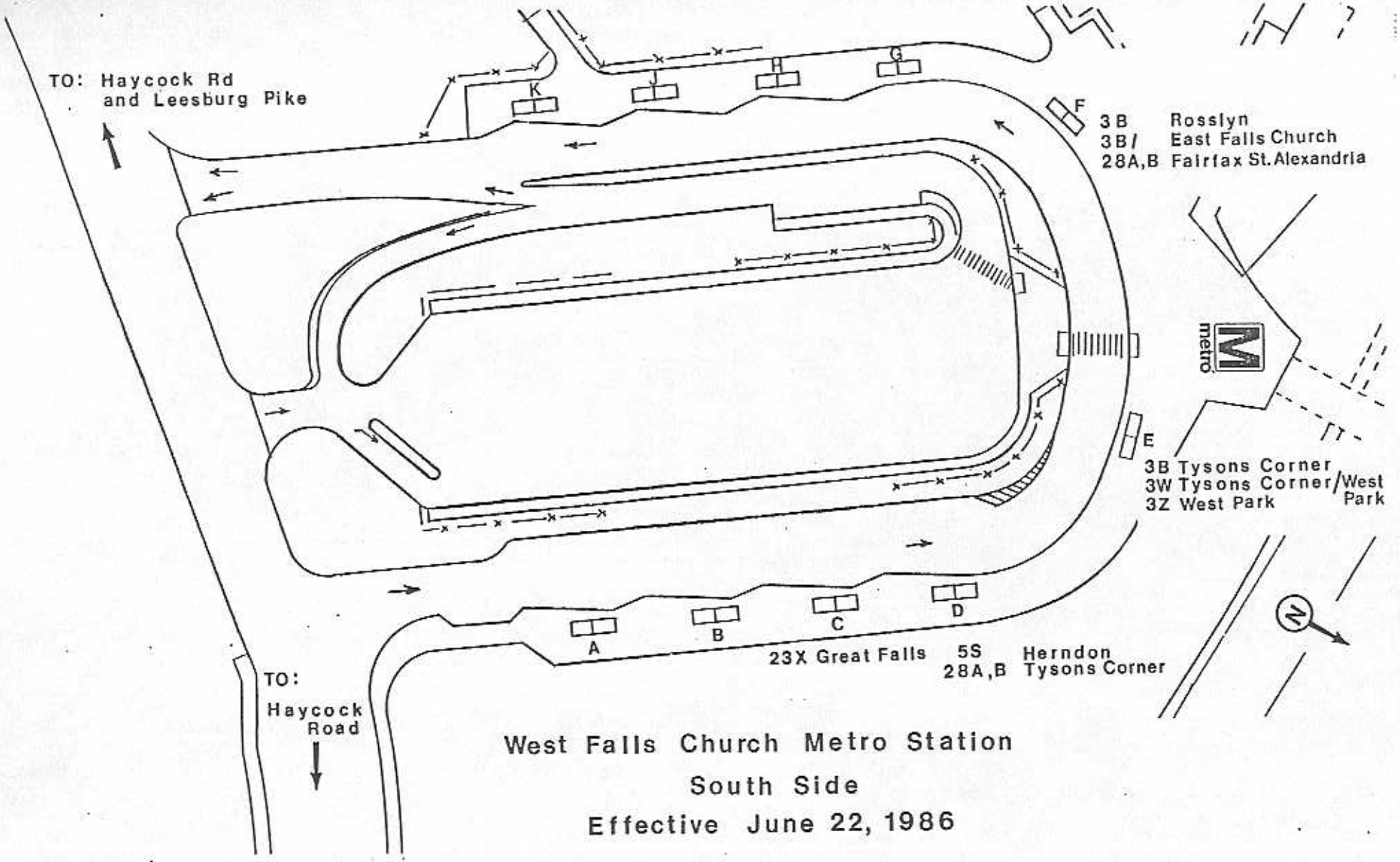

VIENNA METRO STATION
South Side
Effective June 22, 1986
2P,X Dunn Loring
Metro Station
2B Fair Oaks Mall
2B/Oakton
2W Oakton/Vienna
20Y,Z Chantilly
L
K
J
H
G
M
metro
F
12C Centreville
E
2B Ballston
D
C
B
A
TO: Connector Road
across I-66
N
To: Nutley
Street

VIENNA METRO STATION

North Side

Effective June 7, 1986

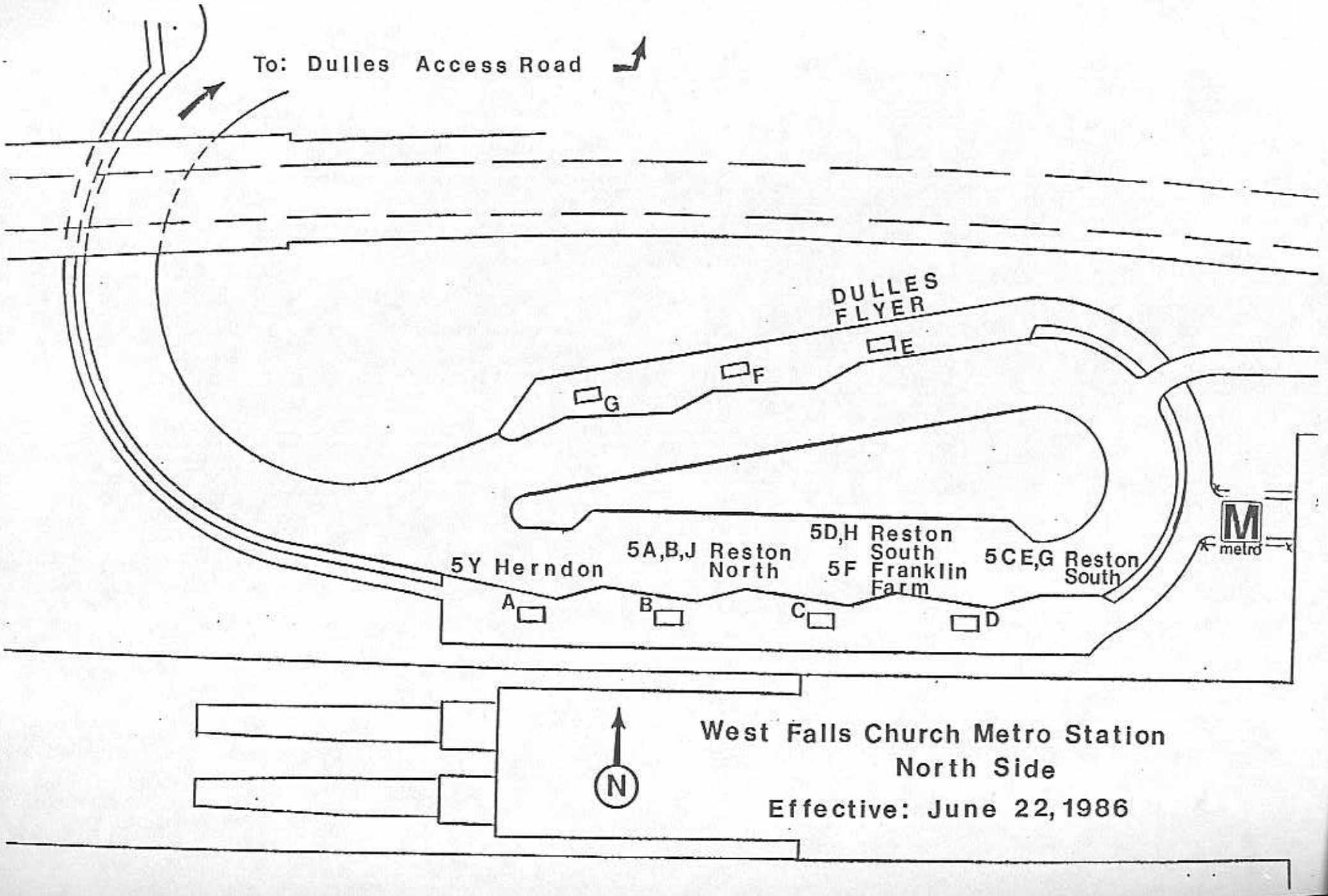


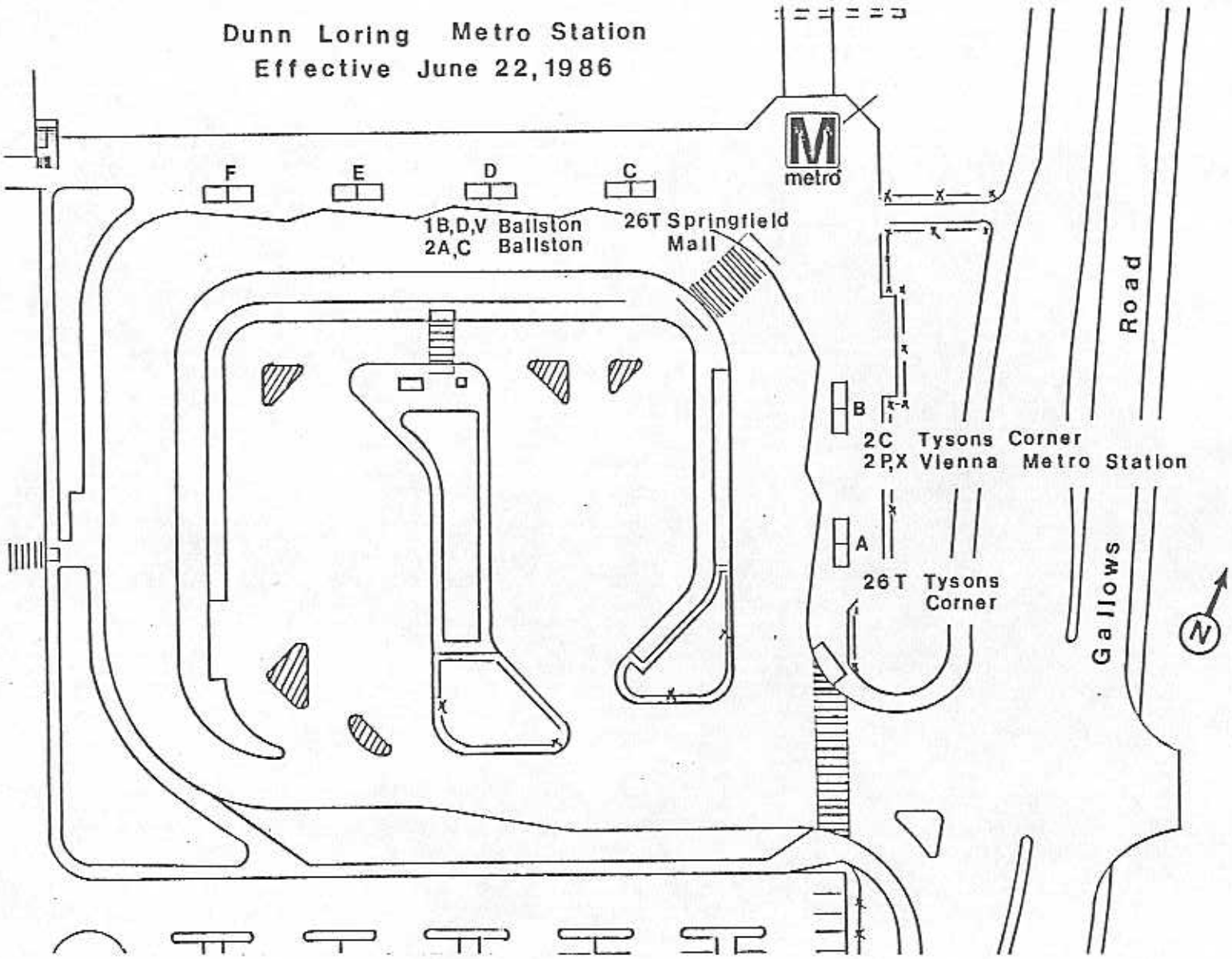


West Falls Church Metro Station

South Side

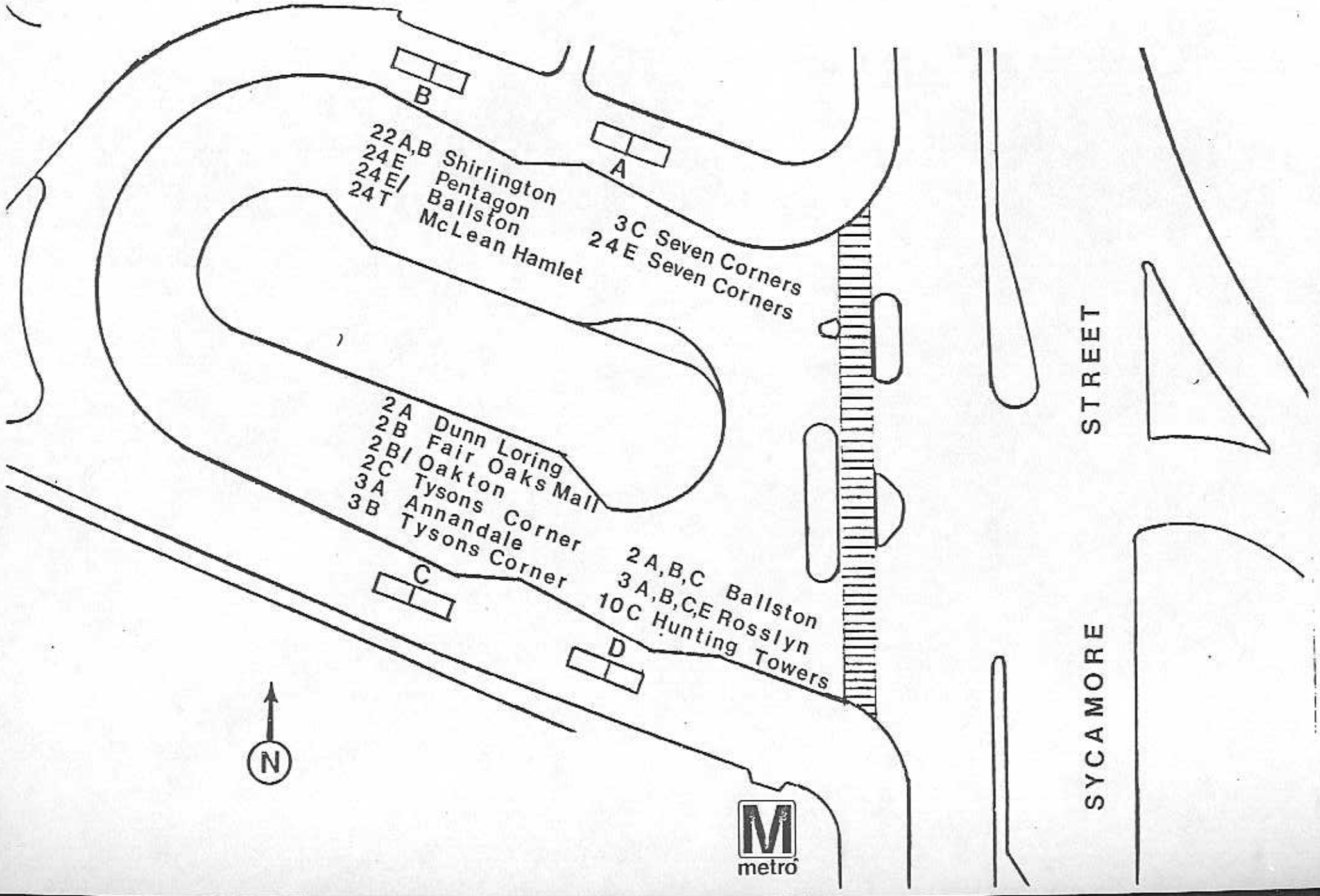
Effective June 22, 1986


To: Dulles Access Road
DULLES FLYER
E
F
G
5Y Herndon
A
5A,B,J Reston North
B
5D,H Reston South
5F Franklin Farm
C
5CE,G Reston South
D
M
metro
N
West Falls Church Metro Station
North Side
Effective: June 22, 1986

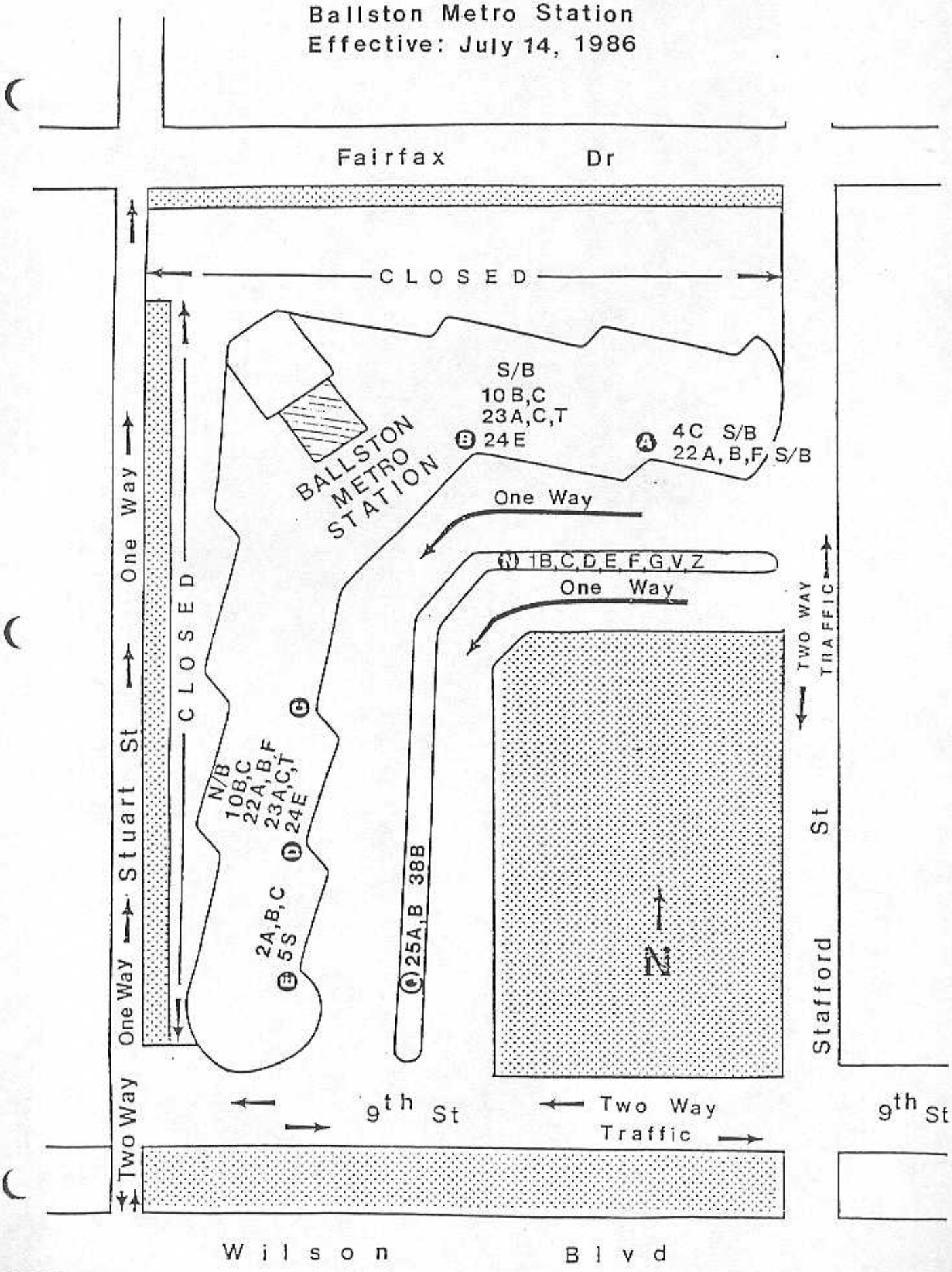

Dunn Loring Metro Station
Effective June 22, 1986
F
E
D
C
metro
1B,D,V Ballston
2A,C Ballston
26T Springfield Mall
Road
B
2C Tysons Corner
2P,X Vienna Metro Station
A
26T Tysons Corner
Gallows
N

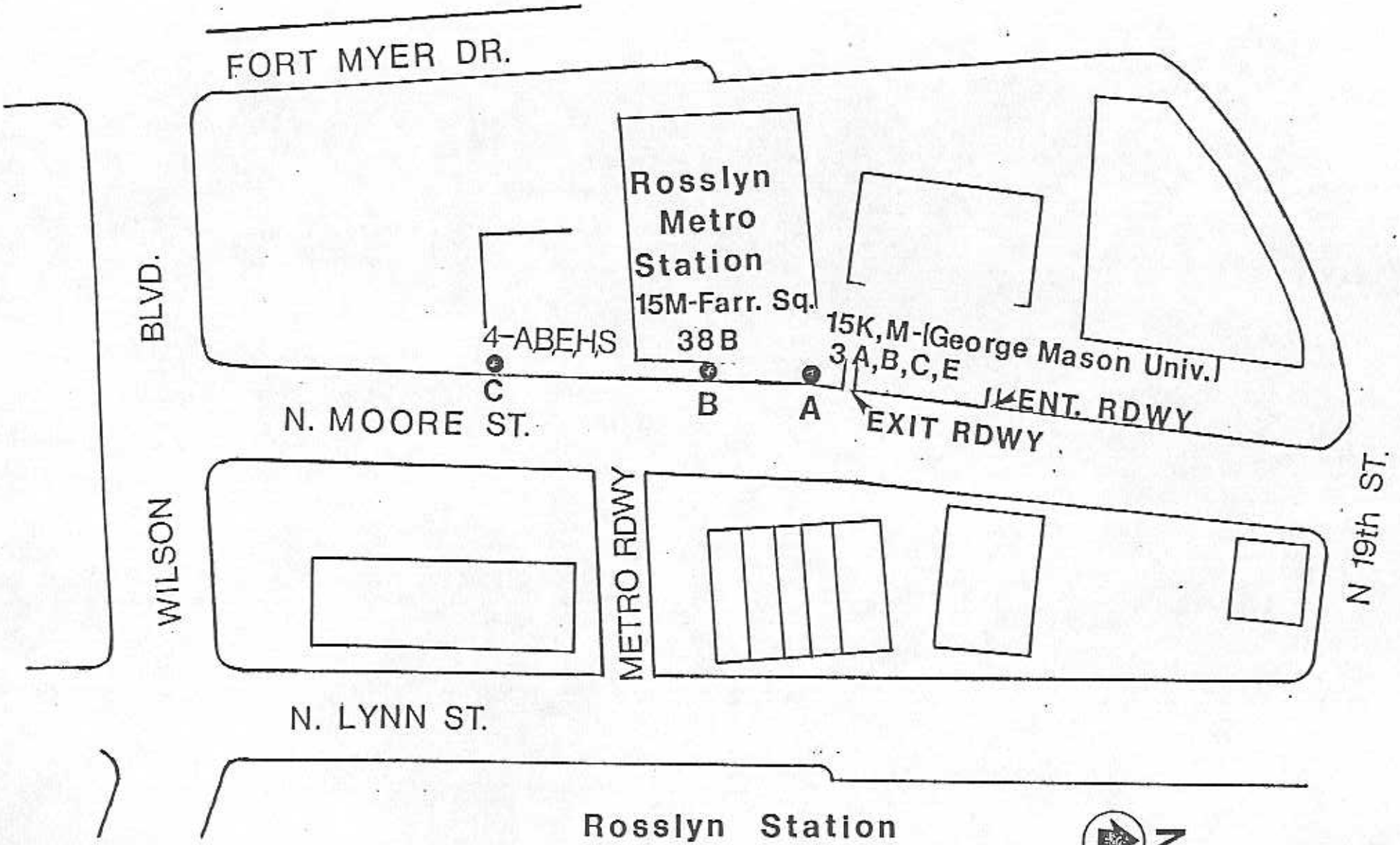
EAST FALLS CHURCH METRO STATION

Effective June 22, 1986



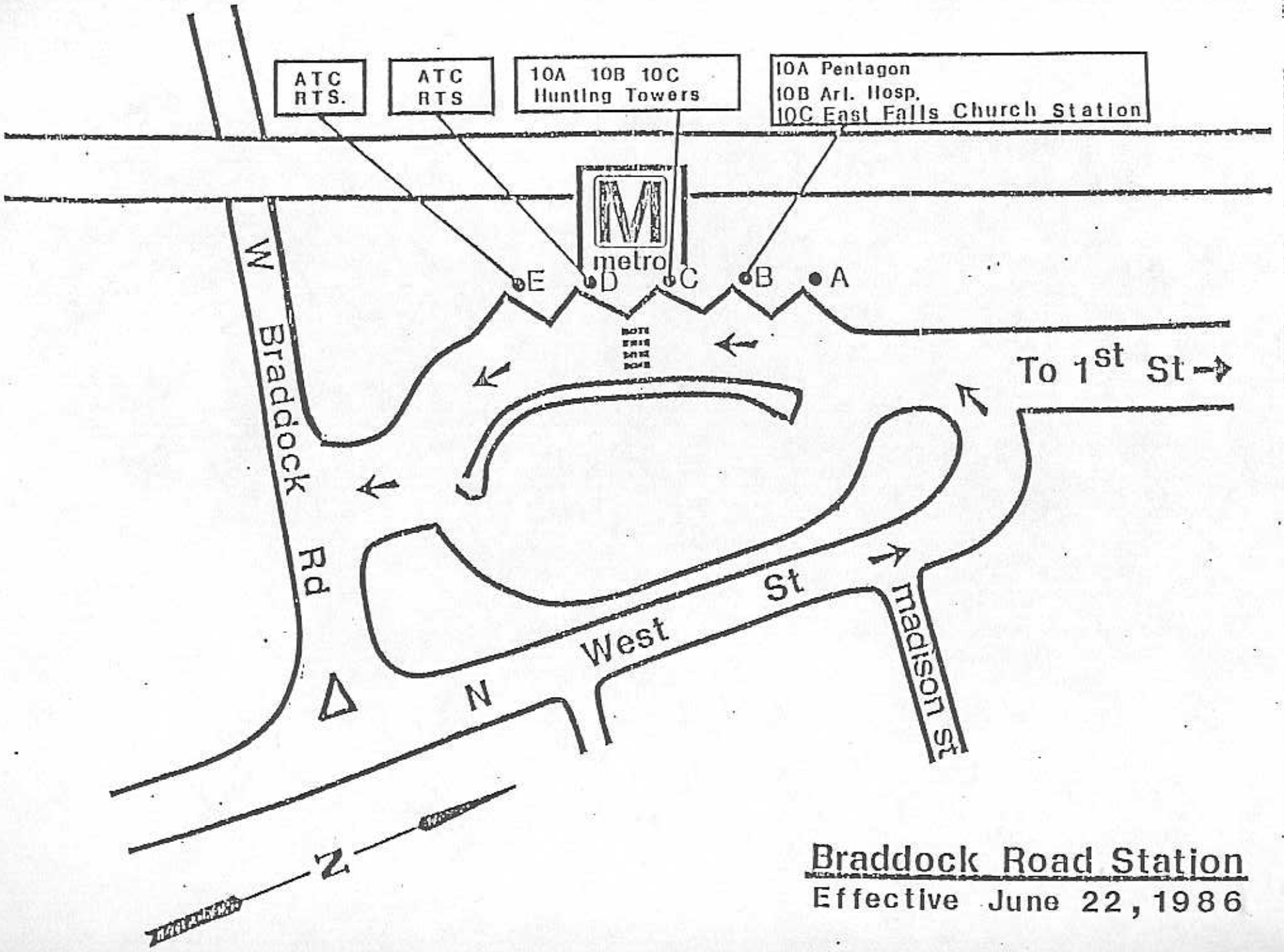
Ballston Metro Station
Effective: July 14, 1986





● BUS STOP LOCATIONS

EFFECTIVE: June 22, 1986



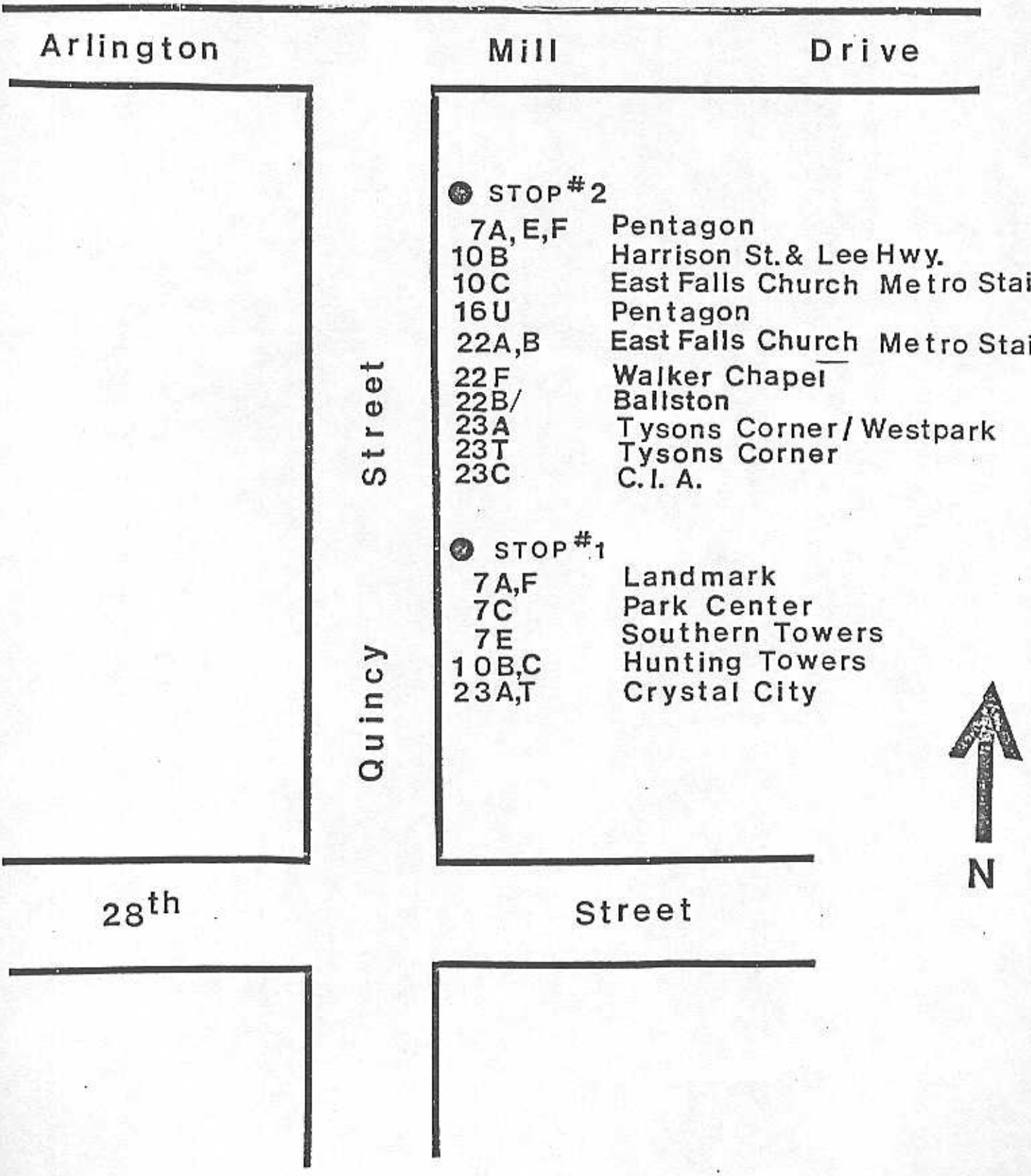
Braddock Road Station

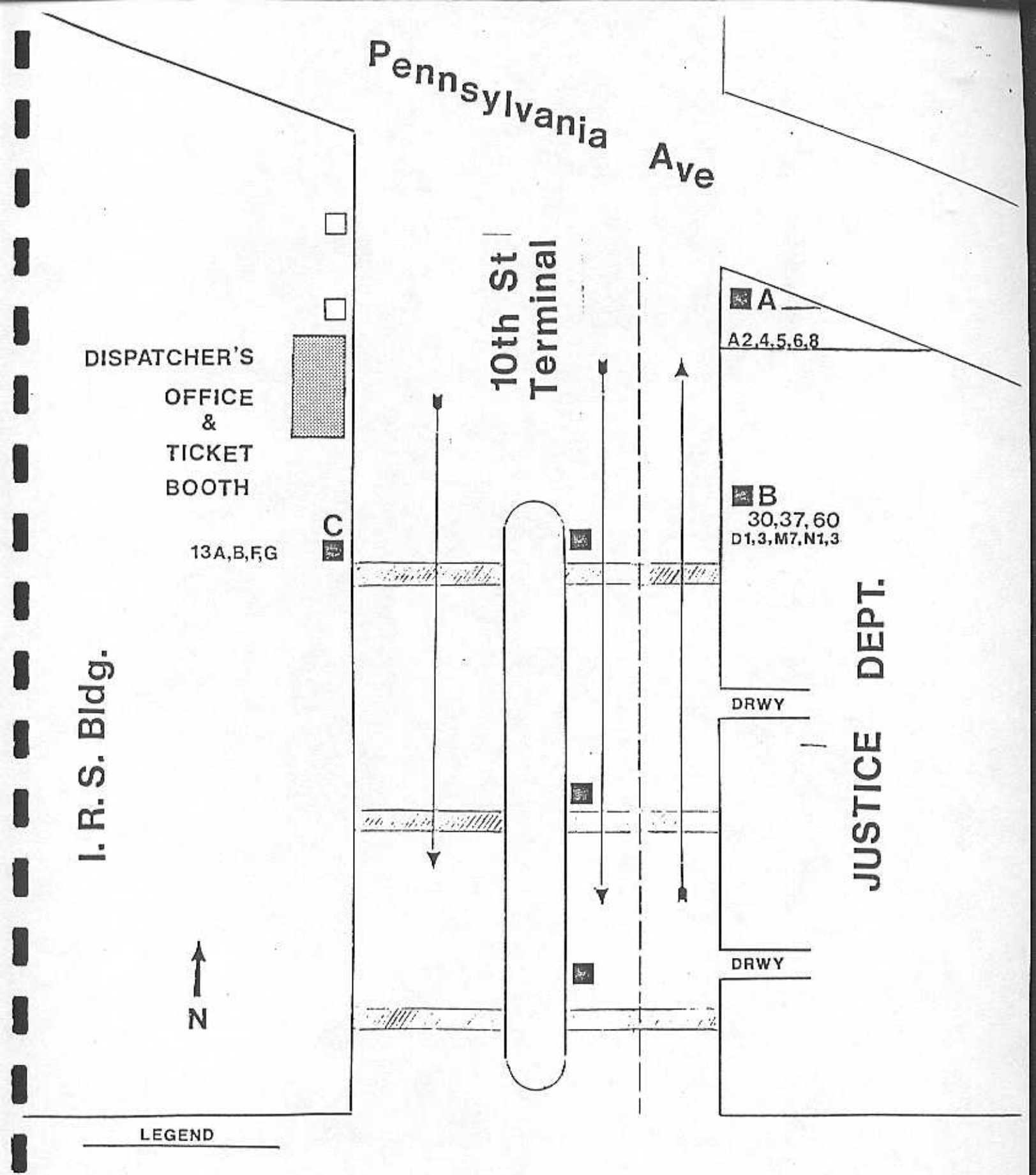
Effective June 22, 1986

New Bus Stops and Layover
SHIRLINGTON

ROUTES 7, 10, 16, 22, 23

Effective: June 22, 1986




Pennsylvania Ave
10th St Terminal
A
A2,4,5,6,8
B
30,37,60
D1,3,M7,N1,3
C
13A,B,F,G
DISPATCHER'S OFFICE & TICKET BOOTH
I.R.S. Bldg.
JUSTICE DEPT.
DRWY
DRWY
N
LEGEND
BOARDING STOPS WITH DESIGNATED ROUTE NUMBERS
CROSSWALKS
Constitution Ave
Effective: June 22, 1986

APPENDIX B

LOCAL TRAVEL PROFILES

CITY OF ALEXANDRIA

POPULATION: 107,500

RESIDENT WORKERS: 16,981

DAILY INBOUND COMMUTERS: 48,291		DAILY OUTBOUND COMMUTERS: 43,560	
ARLINGTON CO.:	7%	ARLINGTON CO.:	22%
FAIRFAX CO.:	59%	FAIRFAX CO.:	13%
FAIRFAX CITY:	1%	FAIRFAX CITY:	1%
FALLS CHURCH:	0%	FALLS CHURCH:	1%
WASHINGTON, DC:	9%	WASHINGTON, DC:	56%
MTGY AND PG, MD:	12%	MTGY AND PG, MD:	5%
OUTLYING AREAS:	12%	OUTLYING AREAS:	1%

MODAL CHOICE (workers)

	RESIDENT	OUTBOUND	INBOUND	TOTAL
AUTO	56%	49%	68%	58%
CARPOOL	15%	25%	24%	23%
TRANSIT	10%	24%	6%	14%
OTHER	18%	2%	2%	4%
TOTAL*	99%	100%	100%	99%

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TRANSIT SERVICES

DASH ROUTES: 2,3,4,5.

CONNECTOR: 110.

METROBUS ROUTES: 6-ADFG; 7-ACEFHPWX; 8-WXZ; 9-AE; 10-ABCE; 11-HPX; 16-L; 17-ABFGHKLM; 18-ABDEF; 21-ABF; 23-AT; 25-AB; 27-G; 28-AB,FG; 29-KIMN.

METRORAIL STATIONS: YELLOW LINE - BRADDOCK ROAD, KING STREET, AND EISENHOWER AVENUE.

SOURCES:
1. Population is a July 1, 1985 estimate from the U.S. Census Bureau.
2. Workplace and commuting information is from the 1980 Census.
3. Transit services are current as of June 22, 1986.

*May not equal 100% due to rounding.

UTPP6: ALEXANDRIA RESIDENTS' TRAVEL PROFILE
BASED ON THE 1980 CENSUS

COUNTY OF RESIDENCE	TOTAL WORKERS	CARS TRUCKS VANS	USING PUBLIC TRANSIT	BICYCLISTS. WALKERS HOME WORKERS	OTHER: MOTOCY., OTHER	WORKERS DRIVING ALONE	WORKERS SHARING DRIVING	DRIVE OTHERS ONLY	RIDE AS PASS. ONLY
WASHINGTON, D.C.	1	24,371	15,991	7,972	139	269	8,816	3,257	1,194	2,724
CHARLES CO.	17	20	20	0	0	0	0	20	0	0
MONTGOMERY CO.	31	1,122	995	115	12	0	754	97	41	103
PRINCE GEORGES CO.	33	1,233	1,181	52	0	0	912	154	57	58
ARLINGTON CO.	13	9,547	7,468	1,939	104	36	5,494	687	560	727
FAIRFAX CO.	59	5,769	5,364	268	137	0	4,271	466	170	457
LOUDOUN CO.	107	136	136	0	0	0	104	17	15	0
PRINCE WILLIAM CO.	153	115	115	9	0	0	115	0	0	0
ALEXANDRIA	510	16,981	12,073	1,782	3,040	86	9,467	856	545	1,205
FAIRFAX CITY	600	583	517	66	0	0	464	12	15	26
FALLS CHURCH	610	631	568	32	31	0	492	30	0	46
MANASSAS	683	33	33	0	0	0	20	0	13	0
TOTAL		60,541	44,461	12,226	3,463	391	30,909	5,596	2,610	5,346

DAILY OUTBOUND COMMUTERS 43,560

ARLINGTON CO.	22%
FAIRFAX CO.	13%
FAIRFAX CITY	1%
FALLS CHURCH	1%
WASHINGTON, D.C.	56%
MARYLAND (M & PG CO.)	5%
OTHER (VA & MD)	1%

	TOTAL		RESIDENT		OUTBOUND	
AUTO	30,909	51%	9,467	56%	21,442	49%
CARPOOL	13,552	22%	2,606	15%	10,946	25%
TRANSIT	12,226	20%	1,782	10%	10,444	24%
OTHER	3,854	6%	3,126	18%	728	2%
TOTAL	60,541		16,981		43,560	

UTPP6: TRAVEL PROFILE OF COMMUTERS TO ALEXANDRIA
BASED ON THE 1980 CENSUS

COUNTY OF RESIDENCE		TOTAL WORKERS	CARS TRUCKS VANS	USING PUBLIC TRANSIT	BICYCLISTS, WALKERS HOME WORKERS	OTHER: MOTOCY., OTHER	WORKERS DRIVING ALONE	WORKERS SHARING DRIVING	DRIVE OTHERS ONLY	RIDE AS PASS. ONLY
WASHINGTON, D.C.	1	4,150	2,965	1,116	53	16	2,061	239	287	378
CHARLES CO.	17	529	514	15	0	0	310	95	91	18
MONTGOMERY CO.	31	1,379	1,306	63	10	0	906	278	82	40
PRINCE GEORGES CO.	33	4,483	4,253	202	11	17	3,092	649	256	256
ARLINGTON CO.	13	3,584	3,132	302	87	63	2,567	202	129	234
FAIRFAX CO.	59	28,317	26,575	1,151	431	160	20,450	3,210	1,135	1,780
LOUDOUN CO.	107	430	430	0	0	0	360	36	16	18
PRINCE WILLIAM CO.	153	4,687	4,614	62	0	11	2,434	1,470	264	446
ALEXANDRIA	510	16,981	12,073	1,782	3,040	86	9,467	856	545	1,205
FAIRFAX CITY	600	437	413	24	0	0	278	104	7	24
FALLS CHURCH	610	57	57	0	0	0	29	0	11	17
MANASSAS	683	148	140	8	0	0	116	24	0	0
MANASSAS PARK	685	90	90	0	0	0	67	23	0	0
TOTAL		65,272	56,562	4,725	3,632	353	42,137	7,186	2,823	4,416

DAILY INBOUND COMMUTERS 48,291

ARLINGTON CO.	7%
FAIRFAX CO.	59%
FAIRFAX CITY	1%
FALLS CHURCH	0%
WASHINGTON, D.C.	9%
MARYLAND (M & PG CO.)	12%
OTHER (VA & MD)	12%

	TOTAL		RESIDENT		INBOUND	
AUTO	42,137	65%	9,467	56%	32,670	68%
CARPOOL	14,425	22%	2,606	15%	11,819	24%
TRANSIT	4,725	7%	1,782	10%	2,943	6%
OTHER	3,985	6%	3,126	18%	859	2%
TOTAL	65,272		16,981		48,291	

	AUTO	CARPOOL	TRANSIT	OTHER	TOTAL
RESIDENT	9,467	2,606	1,782	3,126	
OUTBOUND	21,442	10,946	10,444	728	
INBOUND	32,670	11,819	2,943	859	
TOTAL	63,579	25,371	15,169	4,713	108,832
(%)	58%	23%	14%	4%	

ARLINGTON COUNTY

POPULATION: 157,600

RESIDENT WORKERS: 29,144

DAILY INBOUND COMMUTERS: 88,213		DAILY OUTBOUND COMMUTERS: 58,298	
ALEXANDRIA:	11%	ALEXANDRIA:	6%
FAIRFAX CO.:	45%	FAIRFAX CO.:	13%
FAIRFAX CITY:	1%	FAIRFAX CITY:	1%
FALLS CHURCH:	1%	FALLS CHURCH:	3%
WASHINGTON, DC:	13%	WASHINGTON, DC:	69%
MTGY AND PG, MD:	18%	MTGY AND PG, MD:	7%
OUTLYING AREAS:	11%	OUTLYING AREAS:	1%

MODAL CHOICE (workers)

	RESIDENT	OUTBOUND	INBOUND	TOTAL
AUTO	45%	44%	51%	48%
CARPOOL	17%	23%	32%	26%
TRANSIT	12%	30%	16%	20%
OTHER	26%	3%	1%	6%
TOTAL*	100%	100%	100%	100%

TRANSIT SERVICES

DASH ROUTES: 3,4 (Pentagon Express)

METROBUS ROUTES: 1-BCDEFGVZ; 2-ABC; 3-ABCE; 4-ABEHS,C; 5-NP; 6-ADFG; 7-ACEF; 9-A; 10-ABC; 13-ABCDFG; 15-KM; 16-ABCDEFL,UWX; 17-ABGHKLM; 18-ABDEFGHJKLPR; 19-GY; 21-ABF; 22-ABF; 23-ACT; 24-E,T; 25-AB; 28-GY; 29-BCEFGHX; 38-B.

METRORAIL STATIONS:
- BLUE/YELLOW LINES – NATIONAL AIRPORT, CRYSTAL CITY, PENTAGON CITY, AND PENTAGON.
- BLUE LINE – ARLINGTON CEMETERY.
- BLUE/ORANGE LINES – ROSSLYN.
- ORANGE LINE – COURTHOUSE, CLARENDON, VIRGINIA SQUARE-GMU, BALLSTON, AND EAST FALLS CHURCH.

SOURCES:
1. Population is a July 1, 1985 estimate from the U.S. Census Bureau.
2. Workplace and commuting information is from the 1980 Census.
3. Transit services are current as of June 22, 1986.

*May not equal 100% due to rounding.

UTPP6: ARLINGTON RESIDENTS' TRAVEL PROFILE
BASED ON THE 1980 CENSUS

COUNTY OF RESIDENCE		TOTAL WORKERS	CARS TRUCKS VANS	USING PUBLIC TRANSIT	BICYCLISTS, WALKERS HOME WORKERS	OTHER: MOTOCY., OTHER	WORKERS DRIVING ALONE	WORKERS SHARING DRIVING	DRIVE OTHERS ONLY	RIDE AS PASS. ONLY
WASHINGTON, D.C.	1	40,108	22,696	16,309	802	301	12,961	4,465	1,793	3,477
CHARLES CO.	17	66	66	0	0	0	19	47	0	0
MONTGOMERY CO.	31	2,885	2,509	282	83	11	1,991	216	162	140
PRINCE GEORGES CO.	33	1,300	1,170	130	0	0	826	149	114	81
ARLINGTON CO.	13	29,895	18,538	3,730	6,876	751	13,479	1,590	1,313	2,156
FAIRFAX CO.	59	7,638	7,082	393	120	43	5,741	474	343	524
LOUDOUN CO.	107	118	118	0	0	0	92	26	0	0
PRINCE WILLIAM CO.	153	136	136	0	0	0	59	61	16	0
ALEXANDRIA	510	3,584	3,132	302	87	63	2,567	202	129	234
FAIRFAX CITY	600	661	571	60	30	0	405	67	24	75
FALLS CHURCH	610	1,679	1,428	195	56	0	1,076	169	82	101
MANASSAS	683	115	115	0	0	0	99	16	0	0
MANASSAS PARK	685	8	8	0	0	0	8	0	0	0
TOTAL		88,193	57,569	21,401	8,054	1,169	39,323	7,482	3,976	6,788

DAILY OUTBOUND COMMUTERS	58,298		TOTAL		RESIDENT		OUTBOUND	
ALEXANDRIA	6%	AUTO	39,323	45%	13,479	45%	25,844	44%
FAIRFAX CO.	13%	CARPOOL	18,246	21%	5,059	17%	13,187	23%
FAIRFAX CITY	1%	TRANSIT	21,401	24%	3,730	12%	17,671	30%
FALLS CHURCH	3%	OTHER	9,223	10%	7,627	26%	1,596	3%
WASHINGTON, D.C.	69%	TOTAL	88,193		29,895		58,298	
MARYLAND (M & PG CO.)	7%							
OTHER (VA & MD)	1%							

UTPP6: TRAVEL PROFILE OF COMMUTERS TO ARLINGTON
BASED ON THE 1980 CENSUS

COUNTY OF RESIDENCE		TOTAL WORKERS	CARS TRUCKS VANS	USING PUBLIC TRANSIT	BICYCLISTS, WALKERS HOME WORKERS	OTHER: MOTOCY., OTHER	WORKERS DRIVING ALONE	WORKERS SHARING DRIVING	DRIVE OTHERS ONLY	RIDE AS PASS. ONLY
WASHINGTON, D.C.	1	11,579	6,720	4,627	198	34	3,950	1,002	628	1,140
CHARLES CO.	17	914	863	51	0	0	341	371	66	85
MONTGOMERY CO.	31	5,672	5,121	488	25	38	3,518	1,136	228	239
PRINCE GEORGES CO.	33	10,260	8,695	1,548	6	11	4,997	2,144	829	725
ARLINGTON CO.	13	29,895	18,538	3,730	6,876	751	13,479	1,590	1,313	2,156
FAIRFAX CO.	59	39,415	34,509	4,503	142	261	22,064	7,949	2,071	2,425
LOUDOUN CO.	107	1,390	1,361	23	0	6	684	405	130	142
PRINCE WILLIAM CO.	153	7,110	6,572	518	0	20	2,736	2,386	394	1,056
ALEXANDRIA	510	9,547	7,468	1,939	104	36	5,494	687	560	727
FAIRFAX CITY	600	923	843	85	0	0	583	157	47	56
FALLS CHURCH	610	749	633	97	8	11	516	64	53	0
MANASSAS	683	460	441	19	0	0	248	98	33	62
MANASSAS PARK	685	189	154	20	0	15	81	28	0	45
TOTAL		118,108	91,918	17,648	7,359	1,183	58,691	18,017	6,352	8,858

DAILY INBOUND COMMUTERS 88,213

ALEXANDRIA	11%
FAIRFAX CO.	45%
FAIRFAX CITY	1%
FALLS CHURCH	1%
WASHINGTON, D.C.	13%
MARYLAND (M & PG CO.)	13%
OTHER (VA & MD)	11%

	TOTAL		RESIDENT		INBOUND	
AUTO	58,691	50%	13,479	45%	45,212	51%
CARPOOL	33,227	28%	5,059	17%	28,168	32%
TRANSIT	17,648	15%	3,730	12%	13,918	16%
OTHER	8,542	7%	7,627	26%	915	1%
TOTAL	118,108		29,895		88,213	

	AUTO	CARPOOL	TRANSIT	OTHER	TOTAL
RESIDENT	13,479	5,059	3,730	7,627	
OUTBOUND	25,844	13,187	17,671	1,596	
INBOUND	45,212	28,168	13,918	915	
TOTAL	84,535	46,414	35,319	10,138	176,406
(%)	48%	26%	20%	6%	

FAIRFAX CITY

POPULATION: 20,300

RESIDENT WORKERS: 2,989

DAILY INBOUND COMMUTERS: 18,250		DAILY OUTBOUND COMMUTERS: 7,593	
ALEXANDRIA:	3%	ALEXANDRIA:	6%
ARLINGTON CO:	4%	ARLINGTON CO:	12%
FAIRFAX CO.:	66%	FAIRFAX CO.:	47%
FALLS CHURCH:	0%	FALLS CHURCH:	2%
WASHINGTON, DC:	5%	WASHINGTON, DC:	21%
MTGY AND PG, MD:	6%	MTGY AND PG, MD:	8%
OUTLYING AREAS:	15%	OUTLYING AREAS:	4%

MODAL CHOICE (workers)

	RESIDENT	OUTBOUND	INBOUND	TOTAL
AUTO	70%	66%	77%	73%
CARPOOL	13%	23%	18%	19%
TRANSIT	2%	9%	2%	4%
OTHER	16%	2%	3%	4%
TOTAL*	101%	100%	100%	100%

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TRANSIT SERVICES

CUE BUS ROUTES: GOLD-1,2; GREEN-1,2; RED-1,2.

METROBUS ROUTES: 1-CZ; 15-KLM; 29-K.

METRORAIL STATION: ORANGE LINE - VIENNA.

SOURCES:
1. Population is a July 1, 1985 estimate from the U.S. Census Bureau.
2. Workplace and commuting information is from the 1980 Census.
3. Transit services are current as of June 22, 1986.

*May not equal 100% due to rounding.

UTPP6: FAIRFAX CITY RESIDENTS' TRAVEL PROFILE
BASED ON THE 1980 CENSUS

COUNTY OF RESIDENCE	TOTAL WORKERS	CARS TRUCKS VANS	USING PUBLIC TRANSIT	BICYCLISTS, WALKERS HOME WORKERS	OTHER: MOTOCY., OTHER	WORKERS DRIVING ALONE	WORKERS SHARING DRIVING	DRIVE OTHERS ONLY	RIDE AS PASS. ONLY
WASHINGTON, D.C.	1	1,605	1,069	536	0	0	623	281	90	75
CHARLES CO.	17	20	20	0	0	0	0	20	0	0
MONTGOMERY CO.	31	403	403	0	0	0	293	110	0	0
PRINCE GEORGES CO.	33	208	208	0	0	0	153	55	0	0
ARLINGTON CO.	13	928	843	85	0	0	583	157	47	56
FAIRFAX Co.	59	3,591	3,433	44	85	29	2,803	239	142	199
LOUDOUN CO.	107	93	93	0	0	0	61	8	12	12
PRINCE WILLIAM CO.	153	103	103	0	0	0	103	0	0	0
ALEXANDRIA	510	437	413	24	0	0	278	104	7	24
FAIRFAX CITY	600	2,989	2,463	51	461	14	2,686	93	113	171
FALLS CHURCH	610	120	106	0	14	0	59	16	31	0
MANASSAS	683	67	67	0	0	0	55	12	0	0
MANASSAS PARK	685	18	18	0	0	0	18	0	0	0
TOTAL		10,582	9,239	740	560	43	7,115	1,145	442	537

DAILY OUTBOUND COMMUTERS 7,593

ALEXANDRIA	6%
ARLINGTON CO.	12%
FAIRFAX CO.	47%
FALLS CHURCH	2%
WASHINGTON, D.C.	21%
MARYLAND (M & PG CO.)	8%
OTHER (VA & MD)	4%

	TOTAL		RESIDENT		OUTBOUND	
AUTO	7,115	67%	2,089	70%	5,029	66%
CARPOOL	2,124	20%	374	13%	1,747	23%
TRANSIT	740	7%	51	2%	689	9%
OTHER	603	6%	475	16%	128	2%
TOTAL	10,582		2,989		7,593	

UTPP6: TRAVEL PROFILE OF COMMUTERS TO FAIRFAX CITY
BASED ON THE 1980 CENSUS

	COUNTY OF RESIDENCE	TOTAL WORKERS	CARS TRUCKS VANS	USING PUBLIC TRANSIT	BICYCLISTS, WALKERS HOME WORKERS	OTHER: MOTOCY., OTHER	WORKERS DRIVING ALONE	WORKERS SHARING DRIVING	DRIVE OTHERS ONLY	RIDE AS PASS. ONLY
WASHINGTON, D.C.	1	902	707	178	17	0	438	143	27	99
CHARLES CO.	17	40	40	0	0	0	30	10	0	0
MONTGOMERY CO.	31	569	569	0	0	0	476	91	0	2
PRINCE GEORGES CO.	33	598	571	27	0	0	408	124	39	0
ARLINGTON CO.	13	661	571	60	30	0	405	67	24	75
FAIRFAX CO.	59	12,130	11,654	45	242	189	9,292	887	345	530
LOUDOUN CO.	107	684	663	0	0	21	483	105	52	23
PRINCE WILLIAM CO.	153	1,522	1,496	12	5	9	1,058	238	72	128
ALEXANDRIA	510	583	517	66	0	0	464	12	15	26
FAIRFAX CITY	600	2,989	2,463	51	461	14	2,086	93	113	171
FALLS CHURCH	610	44	44	0	0	0	44	0	0	0
MANASSAS	683	274	274	0	0	0	192	67	15	0
MANASSAS PARK	685	243	243	0	0	0	176	31	20	16
TOTAL		21,239	19,812	439	755	233	16,152	1,868	722	1,070

DAILY INBOUND COMMUTERS 18,250

ALEXANDRIA	3%
ARLINGTON CO.	4%
FAIRFAX CO.	66%
FALLS CHURCH	0%
WASHINGTON, D.C.	5%
MARYLAND (M & PG CO.)	6%
OTHER (VA & MD)	15%

	TOTAL		RESIDENT		INBOUND	
AUTO	16,152	76%	2,089	70%	14,066	77%
CARPOOL	3,660	17%	374	13%	3,283	18%
TRANSIT	439	2%	51	2%	388	2%
OTHER	988	5%	475	16%	513	3%
TOTAL	21,239		2,989		18,250	

	AUTO	CARPOOL	TRANSIT	OTHER	TOTAL
RESIDENT	2,089	374	51	475	
OUTBOUND	5,029	1,747	689	128	
INBOUND	14,066	3,283	388	513	
TOTAL	21,184	5,404	1,128	1,116	28,832
(%)	73%	19%	4%	4%	

FAIRFAX COUNTY

POPULATION: 687,800

RESIDENT WORKERS: 120,690

DAILY INBOUND COMMUTERS: 57,752		DAILY OUTBOUND COMMUTERS: 189,908	
ALEXANDRIA:	10%	ALEXANDRIA:	15%
ARLINGTON CO:	13%	ARLINGTON CO:	21%
FAIRFAX CITY:	6%	FAIRFAX CITY:	6%
FALLS CHURCH:	2%	FALLS CHURCH:	3%
WASHINGTON, DC:	8%	WASHINGTON, DC:	42%
MTGY AND PG, MD:	20%	MTGY AND PG, MD:	9%
OUTLYING AREAS:	40%	OUTLYING AREAS:	3%

MODAL CHOICE (workers)

	RESIDENT	OUTBOUND	INBOUND	TOTAL
AUTO	71%	55%	68%	62%
CARPOOL	16%	32%	27%	26%
TRANSIT	2%	12%	3%	7%
OTHER	11%	1%	1%	5%
TOTAL*	100%	100%	99%	100%

TRANSIT SERVICES

CONNECTOR ROUTES: 101, 102, 103, 104, 105, 106, 107, 108, 109, AND 110.

METROBUS ROUTES: 1-BCDEFVZ; 2-ABC,PWX; 3-ABC,WZ; 4-ABHS,C; 5-ABCDEFGHJNP,S,Y; 7-X; 9-A; 11-HPY; 12-C; 15-KLM; 16-ABCDEFLW; 17-ABFGHKLM; 18-ABDEF,GHJKLPR; 19-L; 20-YZ; 23-AC,X; 24-ET; 26-T; 27-BC,G,YZ; 28-AB,FG; 29-BCEFGHX,KMN.

METRORAIL STATIONS: ORANGE LINE - WEST FALLS CHURCH, DUNN LORING, AND VIENNA.
YELLOW LINE - HUNTINGTON

SOURCES:
1. Population is a July 1, 1985 estimate from the U.S. Census Bureau.
2. Workplace and commuting information is from the 1980 Census.
3. Transit services are current as of June 22, 1986.

*May not equal 100% due to rounding.

UTPP6: FAIRFAX COUNTY RESIDENTS' TRAVEL PROFILE
BASED ON THE 1980 CENSUS

	COUNTY OF RESIDENCE	TOTAL WORKERS	CARS TRUCKS VANS	USING PUBLIC TRANSIT	BICYCLISTS, WALKERS HOME WORKERS	OTHER: MOTOCY., OTHER	WORKERS DRIVING ALONE	WORKERS SHARING DRIVING	DRIVE OTHERS ONLY	RIDE AS PASS. ONLY
WASHINGTON, D.C.	1	80,258	63,311	16,200	263	484	30,072	19,620	4,941	8,678
CHARLES CO.	17	90	90	0	0	0	46	44	0	0
MONTGOMERY CO.	31	11,347	11,163	105	72	7	7,817	2,409	419	518
PRINCE GEORGES CO.	33	6,071	5,940	105	13	13	4,340	1,217	172	211
ARLINGTON CO.	13	39,415	34,509	4,503	142	261	22,064	7,949	2,071	2,425
FAIRFAX CO.	59	120,690	104,976	1,946	12,319	1,449	86,184	9,293	3,501	5,998
LOUDOUN CO.	107	2,552	2,461	9	32	50	1,935	394	86	46
PRINCE WILLIAM CO.	153	1,895	1,895	0	0	0	1,534	271	0	90
ALEXANDRIA	510	28,317	26,575	1,151	431	160	20,450	3,210	1,135	1,780
FAIRFAX CITY	600	12,130	11,654	45	242	189	9,892	887	345	530
FALLS CHURCH	610	6,300	5,619	276	257	148	4,706	481	113	319
MANASSAS	683	1,442	1,403	27	12	0	1,044	281	24	54
MANASSAS PARK	685	91	91	0	0	0	53	24	0	14
TOTAL		310,598	269,687	24,367	13,783	2,761	190,137	46,080	12,807	20,663

			TOTAL		RESIDENT		OUTBOUND	
DAILY OUTBOUND COMMUTERS	189,908	AUTO	190,137	61%	86,184	71%	103,953	55%
ALEXANDRIA	15%	CARPOOL	79,550	26%	18,792	16%	60,758	32%
ARLINGTON CO.	21%	TRANSIT	24,367	8%	1,946	2%	22,421	12%
FAIRFAX CITY	6%	OTHER	16,544	5%	13,768	11%	2,776	1%
FALLS CHURCH	3%							
WASHINGTON, D.C.	42%	TOTAL	310,598		120,690		189,908	
MARYLAND (M & PG CO.)	9%							
OTHER (VA & HD)	3%							

FALLS CHURCH

POPULATION: 9,500

RESIDENT WORKERS: 1,188

DAILY OUTBOUND COMMUTERS: 3,881		DAILY INBOUND COMMUTERS: 11,387	
ALEXANDRIA:	1%	ALEXANDRIA:	6%
ARLINGTON CO:	19%	ARLINGTON CO:	15%
FAIRFAX CO.:	29%	FAIRFAX CO.:	55%
FAIRFAX CITY:	1%	FAIRFAX CITY:	1%
WASHINGTON, DC:	39%	WASHINGTON, DC:	3%
MTGY AND PG, MD:	9%	MTGY AND PG, MD:	9%
OUTLYING AREAS:	1%	OUTLYING AREAS:	11%

MODAL CHOICE (workers)

	RESIDENT	OUTBOUND	INBOUND	TOTAL
AUTO	60%	55%	72%	67%
CARPOOL	7%	28%	18%	20%
TRANSIT	5%	16%	6%	8%
OTHER	28%	2%	5%	6%
TOTAL*	100%	101%	101%	101%

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TRANSIT SERVICES

METROBUS ROUTES: 1-G; 2-ABC; 3-ABC; 24-E; 28-AB.

METRORAIL STATIONS: ORANGE LINE - EAST FALLS CHURCH AND WEST FALLS CHURCH

SOURCES:
1. Population is a July 1, 1985 estimate from the U.S. Census Bureau.
2. Workplace and commuting information is from the 1980 Census.
3. Transit services are current as of June 22, 1986.

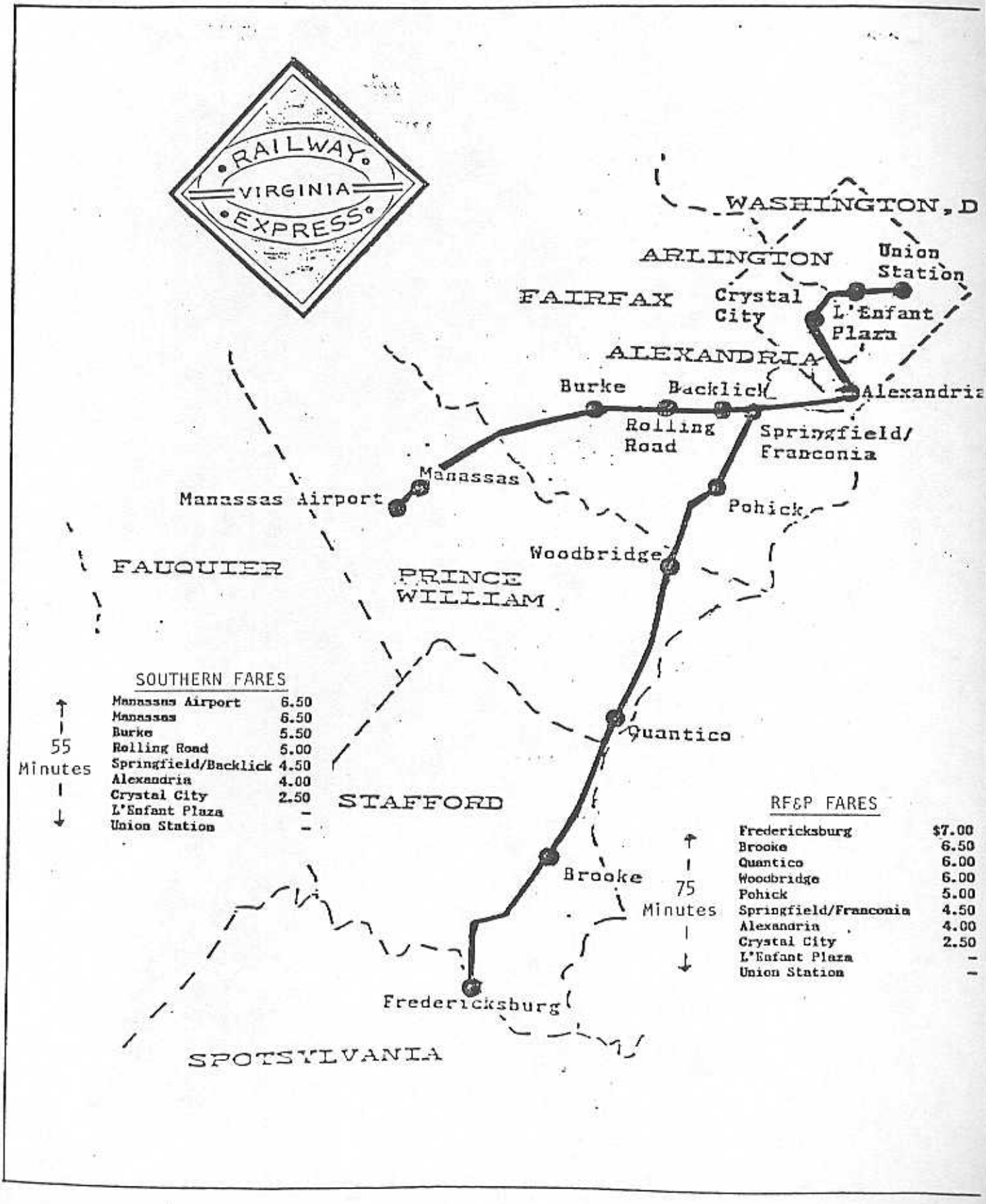
*May not equal 100% due to rounding.

APPENDIX C

NVTC COMMUTER RAIL PROJECT

COMMUTER RAIL
TWO-YEAR DEMONSTRATION PROJECT
FINANCIAL INFORMATION

NVTC
April, 1986
Revised July 1, 1986



SOUTHERN FARES

Manassas Airport	6.50
Manassas	6.50
Burke	5.50
Rolling Road	5.00
Springfield/Backlick	4.50
Alexandria	4.00
Crystal City	2.50
L'Enfant Plaza	–
Union Station	–

RF&P FARES

Fredericksburg	$7.00
Brooke	6.50
Quantico	6.00
Woodbridge	6.00
Pohick	5.00
Springfield/Franconia	4.50
Alexandria	4.00
Crystal City	2.50
L'Enfant Plaza	–
Union Station	–

Figure 1

COMMUTER RAIL
TWO-YEAR EXPERIMENTAL PROGRAM

RF&P LINE

Stations	Round-Trip Fare*	Daily Passengers
Fredericksburg	$7.00	275
Brooke	6.50	75
Quantico	6.00	75
Woodbridge	6.00	400
Pohick	5.00	225
Springfield/Franconia	4.50	400
Alexandria	4.00	0
Crystal City	2.50	0
L'Enfant Plaza	-	0
Union Station	-	0
Total		1,450

* Based on a 20-ride (10 round-trip) discount ticket.

Figure 2

COMMUTER RAIL
TWO—YEAR EXPERIMENTAL PROGRAM

NORFOLK SOUTHERN LINE

Stations	Round-Trip Fare*	Daily Passengers
Manassas Airport	6.50	1000
Manassas	6.50	
Burke	5.50	
Rolling Road	5.00	450
Springfield/Backlick	4.50	75
Alexandria	4.00	0
Crystal City	2.50	0
L'Enfant Plaza	-	0
Inion Station	-	0
Total		1,525

* Based on a 20-ride (10 round-trip) discount ticket.

Figure 3

COMMUTER RAIL
TWO-YEAR EXPERIMENTAL BUDGET
--$ MILLIONS--

CAPITAL COSTS

	RF&P	NS	TOTAL*
Stations	$1.8	$1.7	$ 3.4
Locomotives (leased)	0.6	0.6	1.2
Passenger coaches (leased)	3.2	2.4	5.6
Other	0.6	1.0	2.5
Total	$6.2	$5.7	$12.7

* Includes $0.9 million for spare equipment not allocated to either rail line.

Figure 4

COMMUTER RAIL
TWO-YEAR EXPERIMENTAL BUDGET
—$ MILLIONS—

OPERATING COSTS

	RF&P	NS	TOTAL
Crews	$0.8	$0.8	$ 1.6
Maintenance	1.4	1.4	2.8
Fuel	0.5	0.5	1.0
Risk Management	1.1	1.1	2.2
Amtrak	2.8	0.5	3.3
Admin/Marketing	0.3	0.3	0.6
Other	0.2	0.3	0.5
Total	$7.1	$4.9	$12.0

Figure 5

COMMUTER RAIL
TWO-YEAR EXPERIMENTAL BUDGET
—$ MILLIONS—

SUBSIDY

	RF&P	NS	TOTAL
Operating Revenues	$3.8	$4.1	$ 7.9
Operating Costs	7.1	4.9	12.0
Operating Subsidy	(3.3)	(0.8)	(4.1)
Capital Costs	6.2	5.7	12.7
Total Subsidy	(9.5)	(6.5)	(16.8)

Figure 6

COMMUTER RAIL
TWO-YEAR EXPERIMENTAL BUDGET
—$ MILLIONS—

POTENTIAL SOURCES OF FUNDING

Source	Amount
Total subsidy	($16.8)
Federal capital grant	.75
State match	.24
State grant for insurance	.15
State grant for marketing	.25
Federal formula assistance*	4.0
Requested new state capital assistance	4.0
Transportation District fuel tax revenues**	3.2
Business contributions***	.5
Local appropriations and in-kind capital	3.8

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* Available under current Federal programs in 1988 for refunding capital costs. In the meantime, a state grant would be sought.

** Assumes Prince William County, Stafford County, and Manassas join the new District.

***Advertising revenues and employer and developer funding.

Figure 7

COMMUTER RAIL
TWO—YEAR EXPERIMENTAL BUDGET
—$ THOUSANDS AND PERCENT—

RIDERS AND SUBSIDY BY JURISDICTION

Jurisdiction	Estimated Riders (%)	Estimated Operating Subsidy*	Estimated Capital Subsidy**	Estimated Total Subsidy
Alexandria	0%	$ 103	$ 77	$ 180
Arlington Co.	0%	151	165	316
Fairfax Co.	27.3%	1,726	5,539	7,265
Fredericksburg	4.0%	124	499	622
Manassas	6.7%	190	854	1,043
Manassas Park	2.5%	71	277	348
Prince William Co.	43.2%	1,260	3,849	5,109
Spotsylvania Co.	7.0%	217	588	806
Stafford Co.	9.3%	294	856	1,150
Total	100.0%	$4,136	$12,704	$16,839

---

* Assumes two years of operations with cost allocations based on 10% population/90% ridership, less operating revenues in each jurisdiction based on 3,000 daily round-trips.

** Assumes sites would be the responsibility of each local jurisdiction. Costs of rolling stock and terminals allocated using 10% population/90% ridership formula. $1 million in Federal/State aid will be used to defray capital expenses.

Figure 9

COMMUTER RAIL
TOTAL TWO-YEAR OBLIGATIONS
—$ THOUSANDS—

REQUESTED FUNDS BY JURISDICTION

Jurisdiction	Implementation Consultant	Risk Analysis	Six-Month Amtrak Virginian	Two-Year Experiment**	Total
Alexandria	$ 5	$ 3	$ 5	$ 180	$ 193
Arlington Co.	—*	3	7*	316	326
Fairfax Co.	14	9	143	7,265	7,431
Fredericksburg	3	2	29	622	656
Manassas	3	2	—	1,043	1,048
Manassas Park	—	—	—	348	348
Prince William Co.	15	9	155	5,109	5,288
Spotsylvania Co.	5	3	49	806	863
Stafford Co.	5	3	72	1,150	1,230
Commonwealth of VA.	—	—	150	—	150
Total	$ 50	$ 33	$ 610	$16,839	$17,533

* Arlington committed an additional $5,000 toward site improvements at the Crystal City station.

** Excludes $237,500 in State funds to match a Federal capital grant.

- To provide access to the Virginian, NVTC and jurisdictions in the service area, with the help of engineers from the Virginia Department of Highways and Transportation, have investigated several possible parking and platform sites. Sites have been agreed to, including Fredericksburg, Brooke (Stafford County), Woodbridge at Dawson Beach Road and Quantico (both in Prince William County), Pohick Road (Fairfax County), Alexandria, Crystal City, L'Enfant Plaza and Union Station. Simple wooden platforms would be erected, and sufficient surface parking provided, for approximately $1 million. Amtrak will require several weeks to erect the platforms at these sites. VDH&T has agreed to take over parking lots by ownership or lease, in the same manner as it operates park-and-ride lots.

- Administrator Ralph Stanley of the Urban Mass Transportation Administration has announced that his Federal agency will provide three-quarters of the capital costs for parking and platforms. VDH&T has promised to cover the remaining 25 percent non-Federal share of these costs, less $13,500. Local governments will be responsible for the remainder.

- To devise solutions to several remaining issues, Congressman Parris appointed (in mid-October 1985) a commuter rail task force consisting of elected officials and citizens. Five subcommittees of the task force addressed: 1) A formula method to allocate operating costs among the jurisdictions that will benefit from the Virginian's commuter service; 2) Responsibility for passenger liability insurance; 3) Real estate issues, including platform sites; 4) Private sector participation; and 5) Fares and marketing.

- Initial meetings of these subcommittees produced several recommendations. For example, the Formula Allocation Subcommittee met often to review alternative means to raise the required operating funds, and reached agreement on November 15, 1985. The Fares and Marketing Subcommittee has recommended a fare structure with a maximum fare of $7.00 round-trip from Fredericksburg for regular commuters, and proposed a $35,000 marketing plan.

- Regarding local financial support for the Virginian's operating shortfalls, Arlington and Alexandria would make lump-sum contributions, while Spotsylvania County, Fredericksburg, Stafford County, Prince William County and Fairfax County would participate in a formula that utilizes population (10 percent) and estimated ridership (90 percent) to distribute funding responsibilities. The formula would utilize actual ridership to replace estimated ridership for the second six months. Each jurisdiction has been asked to ratify the agreement. All have done so except Spotsylvania County. A formal master service contract will be agreed to at a later date.

APPENDIX D

METRO CONCEPT PAPER ON INNOVATIVE SERVICE OPTIONS

INNOVATIVE SERVICE PACKAGE:

OPTION #8

PHASE I, TASK 4

NOVEMBER 1985

REGIONAL/LOCAL BUS STUDY

SCENARIO #8: INNOVATIVE SERVICE PACKAGE

I. INTRODUCTION

Scenarios 1-6 have speculated on the impact on the Region of various gradations of locally-operated bus service. Scenario 7 discussed potential actions which the Authority could take to improve the efficiency of Metrobus service. Scenario 8 builds on the efficiencies assumed in Scenario 7, and proceeds to analyze various areas in which the market for Metrobus service could be expanded and various types of service delivery options could be utilized to improve productivity.

Due to the innovative nature of the programs suggested in Scenario 8, a sketch plan approach was utilized rather than the more detailed analysis used in the other scenarios. Thus, the findings here are of a more general nature. However, all of the techniques and programs discussed in Scenario 8 have been individually and successfully undertaken in transit properties in North America.

The concepts analyzed in Scenario 8 need additional study. However, a preliminary examination indicates that most of the programs appear to be applicable for use by WMATA and that, given the total package and assumptions detailed in the study, ridership could be increased at negligible additional costs.

II. CHANGING MARKET

20 years ago, the travel patterns of the region were downtown-oriented. Later, the newly emerging Metrobus system, formed by consolidating the private bus systems, emphasized this downtown-orientation. With the construction of Metrorail, Metrobus has evolved to become more and more a feeder to the rail, which serves the downtown-oriented market.

More recently, there has been substantial residential, commercial, and employment growth in the suburbs. And, the overall travel patterns of the region have expanded to include many trips that are not downtown-oriented, but are suburban oriented. In fact, the majority of the region's travel is not oriented downtown. This is true of peak and off-peak trips. While there are several areas of concentration for suburban trips (for example at Tysons Corners, Bethesda, and New Carrollton), most of the new suburban-oriented trips are generally more dispersed than the downtown-oriented pattern.

III. CHALLENGE

This recent evolution of the travel market provides WMATA with the opportunity to explore the feasibility of widening its focus from a downtown-orientation to a fully regional orientation - in other words, to serve the new non-downtown market as efficiently and effectively as Metrobus now serves and will continue to serve the downtown market. This offers new challenges to WMATA, especially considering the difficulty of serving the dispersed non-downtown- oriented travel patterns in the suburbs. This challenge will require innovative service delivery systems and equipment options.

IV. NORTH AMERICAN EXPERIENCE

Most major urban areas in North America are facing this same challenge of adapting their downtown oriented system to the new non-downtown travel market. Over the last decade, an array of service innovations has been successfully demonstrated and adopted. Among the many examples of proven successes are:

Portland, Oregon - a system of convenient bus-to-bus timed-transfer concept, facilitating transit penetration of the suburban market

Denver, Colorado - service to non-downtown regional market by the use of various service types and by the application of service standards to guide in the appropriate selection of modes

Detroit, Michigan (SEMTA) - development of a large small-bus system to serve the suburbs

Los Angeles, California - use of private carriers to provide some peak period downtown-oriented express service

Houston, Texas - provision of large Park-and-Ride lots served by express buses; and, provision of van pool matching, vehicle leasing, and high occupancy vehicle lanes

San Diego, California - use of taxis to provide service to low density markets

Ann Arbor, Michigan - use of taxis to provide service during low productive time periods, such as evening and late night

Chicago, Illinois - coordination of the overall regional transit system through the brokerage of service and funds, and the provision of overall regional transit planning

Phoenix, Arizona - substitution of taxis for low productive Sunday bus service

Dallas, Texas - private carriers providing downtown oriented express service, and development of an expanded suburban service

Edmonton, Canada - timed transfer bus-to-bus connections at convenient transit centers to serve the suburban market; and convenient integration of its bus and light-rail system

Tidewater area, Virginia - integration of a wide range of modes and services (both public and private) to serve low density, low productive markets

Washington, DC - pioneer in high occupancy vehicles (HOV) lanes on freeways and on city streets; integration of bus and rail; and efficient scheduling procedures.

These service innovations have had the effect of increasing market penetration and providing public transit service to growth areas. The result has been increases in system ridership at a cost that is within the constraints of the transit service budgets of these cities.

V. SERVICE PROPOSAL

Based on these many successful examples, staff has assembled the best of these ideas into a package of service innovations to be examined as a means of potentially widening WMATA's focus from a downtown-oriented system to a regionally-oriented system, capable of serving the large non-downtown market as effectively and efficiently as service is and will be provided for the downtown market. At this stage of development, the proposed package of service innovations is of a sketch plan nature and will require more detailed study.

In general terms, the service package could support the 103 mile Metrorail system and a grid-type system of high speed/high frequency line haul buses on major arterial streets and the freeways through a comprehensive system of neighborhood and activity center circulators. Urban and suburban residential, commercial and employment sites could be linked together into one integrated transit system providing increased transit access to most areas of the region.

Specifically, this service package could consist of four major components:

Component #1 - the 103 mile Metrorail system would provide the major single connector linking neighborhoods and activity centers throughout the region. Each of the Metrorail stations could act as a convenient transfer point for passengers using neighborhood feeders and activity center circulators, as well as interconnecting line haul Metrobuses.

Component #2 - rapid, high frequency line haul buses would travel on the major suburban, cross county, and downtown arterials, as well as major circumferential and downtown-oriented freeways. This "grid-like" pattern of high speed connectors could feed the Metrorail wherever possible, and provide timed-transfers between other high speed line haul buses and between neighborhood and activity center circulators. High speed, high frequency line haul buses could increase their speeds through the use of bus priority treatments to facilitate access to/from Metrorail stations, major commercial/ employment centers, and to negotiate congested intersections.

Component #3 - neighborhood penetration would be accomplished by utilizing small vehicles to provide convenient circulation within neighborhoods, carrying passengers to/from timed-transfer points with Metrorail and rapid line haul Metrobuses directed to a wide range of urban and suburban locations; the provision of Park-and-Ride lots served by rapid line-haul buses;

ridesharing information, and assistance in van leasing could be provided for those neighborhoods where direct neighborhood transit penetration would not be cost-effective.

Component #4 - activity center penetration would be accomplished by utilizing small vehicles to provide convenient and frequent circulation within major employment, commercial , cultural, and entertainment centers, by carrying passengers to/from timed transfer points with Metrorail and rapid line haul buses coming from a wide range of urban and suburban locations.

VI. SERVICE CONCEPTS

These four components are exemplified in several concepts shown in the schematic maps in Appendix A.

District of Columbia/Prince George's County (map 1)

This concept provides for:

1) stimulation/simulation of demand for Metrorail using high speed line haul before Metrorail construction is completed in a corridor
2) circumferential line haul on freeways
3) Capital Center shuttle (activity center pentration)

Virginia (map 2)

This concept provides for:

1) Tysons Corner becomes a major transit center (activity center penetration)
2) line haul bus/rail
3) circumferential line hauls with transfer feeders to Metrobus/Metrorail linehaul (neighborhood/activity center)
4) timed transfer point with Metrobus and Metrorail

Montgomery County/Prince George's County (map 3)

This concept provides for:

1) conversion of complex branching service to line haul buses fed by neighborhood circulators
2) Park-and-Ride lots
3) timed transfers between line hauls, feeders and Metrorail
4) circumferential line hauls between the Wheaton Station and the Greenbelt Station.

VII. MOBILITY IMPROVEMENTS

The regional-oriented innovative service proposal could offer several improvements over the current downtown-oriented system:

Improvement #1 - there would be a higher percentage of residential areas conveniently served by transit

Improvement #2 - there would be a higher percentage of commercial, employment, cultural and recreational areas conveniently served by transit; in particular, and this could facilitate the access of suburban job opportunities by all segments of the region, especially District residents

Improvement #3 - there would be quick and convenient direct transit service within the suburbs without travelling circuitous and time-consuming paths

Improvement #4 - use Metrorail to its best advantage as a way of quickly moving large volumes of passengers between areas, both for downtown-oriented as well as non-downtown oriented trips

Improvement #5 - provide convenient transit access to the region's universities/colleges, cultural sites, and special event entertainment centers.

In summary, the proposed regionally-focus transit system would significantly improve transit access and mobility for the entire region, by the use of those innovative service delivery strategies and appropriately sized vehicles that have proven to be so successful in other North American urban areas. The non-downtown markets would be more effectively served, and the downtown market would continue to be served effectively and efficiently.

VIII. FISCAL IMPACTS

Subject to more detailed study, this proposal service package could:

- require a fleet of approximately 1,550 vehicles, with greater emphasis on small buses
- add approximately 4,000,000 annual boardings
- add approximately 6,000,000 annual service miles and 500,000 annual service hours

(These figures use the projected bus system associated with the 103-mile rail system as a point of reference.)

Successful experiences in other urban areas indicate that WMATA should consider applying service standards to the overall proposed regional system to identify the lowest productive services (such as particular late night, weekend, midday, straggler, feeder, and circulator services). These lower productive services could then be evaluated as to whether they could more cost-effectively be operated by WMATA or by other providers under contract to and controlled by WMATA. This technique of using other carries to provide fixed route and demand responsive van/taxi service at lower unit costs is being used repeatedly throughout this country to provide needed low productive service at acceptable costs to transit authorities and the public.

If this technique were used, WMATA would directly operate the vast majority of the service miles and hours in the proposed regional network, while coordinating and brokering the remaining service to other providers such as bus/van/taxi service.

This overall cost-effective approach, coupled with the cost savings outlined in Scenario #7 of the Regional/Local Bus Study, could allow WMATA to provide the proposed expanded regionally-oriented system at approximately a minimal or no increase in operating costs and operating assistance, assuming constant dollars.

IX. SUMMARY

The proposal would strengthen and enhance transit service provided to the public in several key ways:

1) WMATA would better serve the changing travel patterns by expanding its focus from a downtown-orientation to a regional-orientation

2) WMATA would provide the expanded service package in a cost-effective/cost conscious manner by using the mix of modes, services, and providers that best matches the demand with service

3) WMATA would improve transit service by capitalizing on its natural role as the
   - regional transit planner
   - coordinator/integrator/broker of transit services (both public and private)
   - provider of marketing and customer information
   - central funding source.

X. FUTURE ACTIONS

In order to carry forward this proposal, staff has already begun to develop service productivity indicators and standards, in order to identify low productive routes and potential service refinements. Recommendations for standards will be developed by the end of April.

Staff is already working with COG to obtain a comprehensive and up-to-date transit market data base for the region.

We have already implemented successful examples of some innovative service - for example:

- o neighborhood circulators - Metrobus Routes M18 and M16
- o activity center circulator - Metrobus Route M7
- o timed transfer/transit center - at Addison Road Station for PG Metrobus routes
- o circumferential line haul - Metrobus Routes 26A,T in VA (Tysons-Springfield)
  - Metrobus Route P13 in PG/VA (Eastover-Pentagon)

- o high speed line haul (coupled with neighborhood penetration)
  - Metrobus Route 19L (Lorton Express)
  - Metrobus Route 89 (Laurel Express)
- o Park and Ride/fringe parking
  - Metrobus Route 18P/R (Rolling Valley Mall)
  - Metrobus Route C11 (Clinton Express)
- o contraflow (suburban job opportuntites)
  - Metrobus Route 29C (NVCC/Pentagon)
  - Metrobus Route 18E (Springfield/Industrial Park)
  - Metrobus Route C11 (Clinton)
  - Metrobus Route T19 (Bowie)

More tests of these types of innovative services could be conducted throughout the region.

There are other innovative services in this package that we will need to test - for example:

- use of special vehicles (van, taxis, very small buses)
- van pool leasing/rideshare matching
- contracting out to low-cost private carriers
- line haul/feeder/timed transfer on a full corridor basis with all components present.

These service delivery options would be tested in various locations throughout the region and from this experience staff would build the basis for expansion of these concepts regionwide.

Staff is eager to build on the innovative services and methods it has already implemented and to test the remaining components of the proposed expanded service package.

Using this approach, WMATA would expand its focus from a downtown-orientation to a regional-orientation, and to serve the non-downtown market as efficiently and effectively as we now serve and will continue to serve the downtown market.

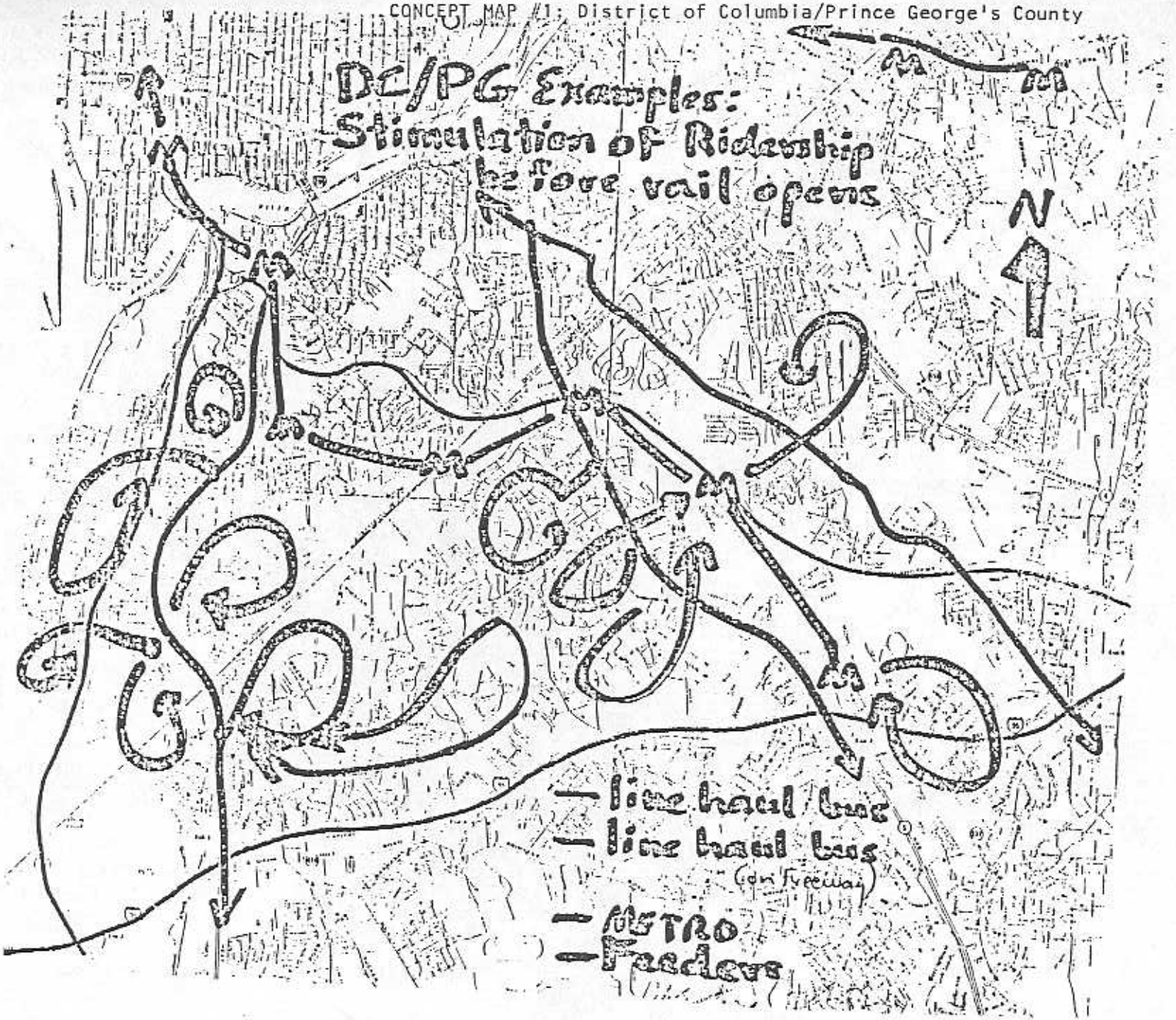
APPENDIX A

Concept Map #1: District of Columbia/Prince George's County

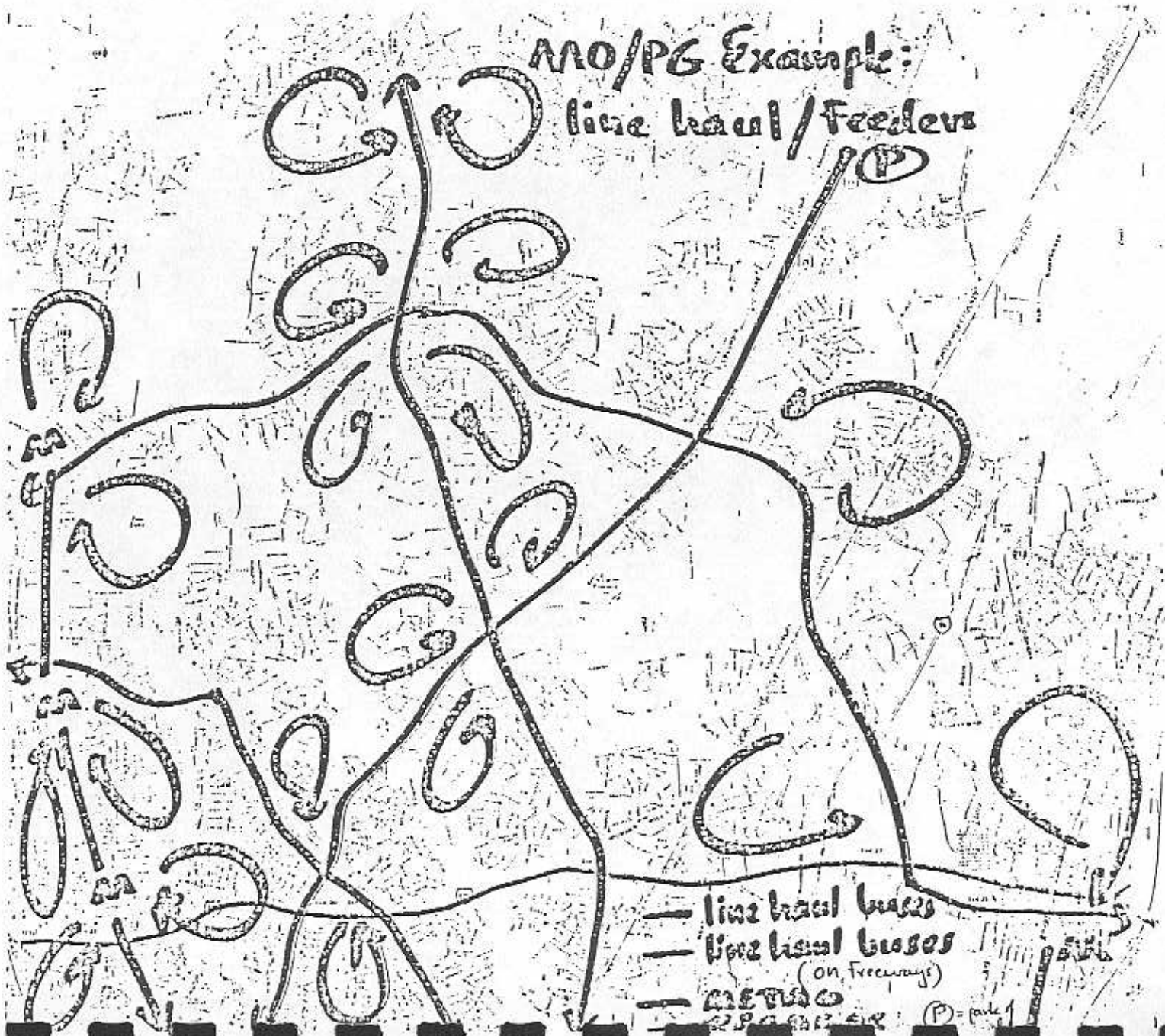
Concept Map #2: Virginia

Concept Map #3: Montgomery County/Prince George's County

CONCEPT MAP #1: District of Columbia/Prince George's County



CONCEPT MAP #3: Montgomery County/ Prince George's County

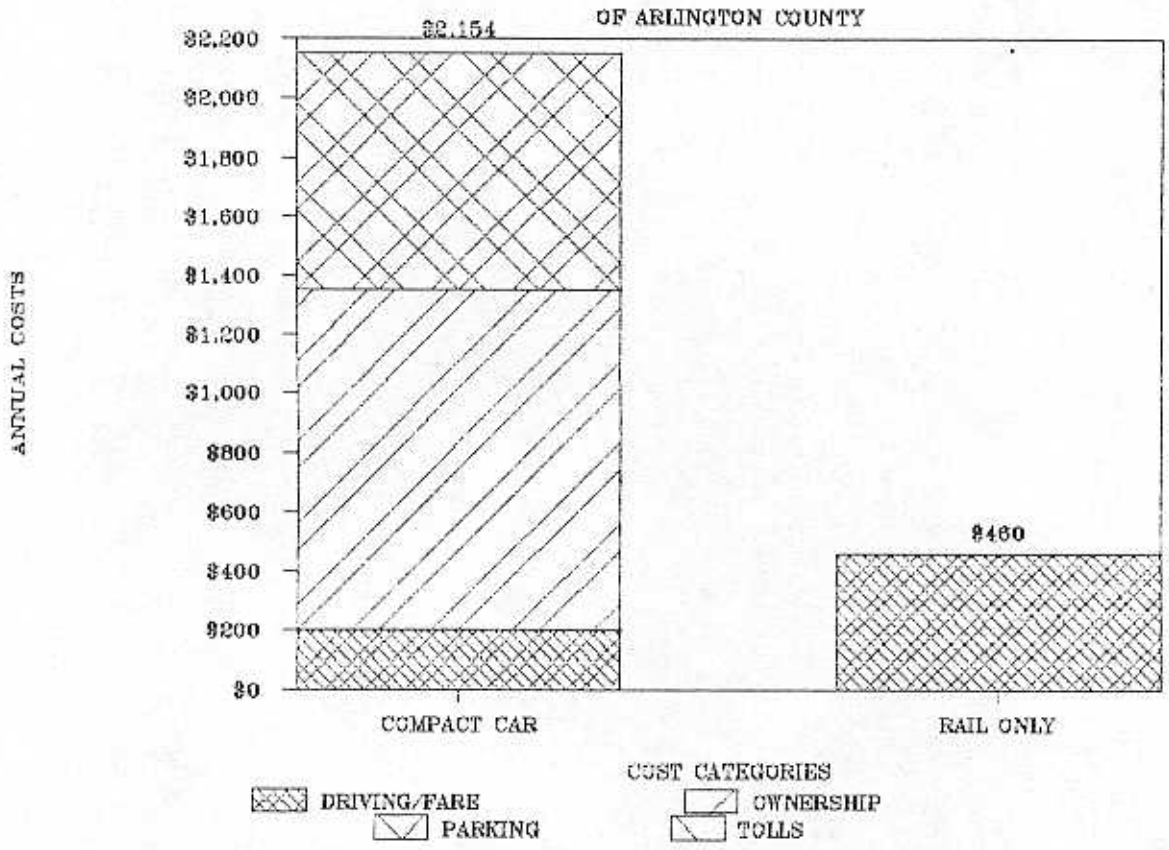


APPENDIX E

NVTC'S AUTO/TRANSIT COST MODEL

COMMUTING COSTS FOR SARAH JOHNSON

OF ARLINGTON COUNTY



COMMUTING COSTS FOR SARAH JOHNSON
OF ARLINGTON COUNTY

FROM : BALLSTON
TO : FARRAGUT WEST

*** WITH 50 % OF CAR OWNERSHIP COSTS ALLOCATED TO COMMUTING ***

ANNUAL COSTS	CAR DRIVING COSTS OR TRANSIT FARE	CAR OWNERSHIP COSTS	PARKING FEES	DULLES TOLLS	CAR TO TRANSIT DRIVING COSTS	ANNUAL COMMUTING COST	MONTHLY COMMUTING COST	WEEKLY COMMUTING COST	DAILY COMMUTING COST
COMPACT CAR	$199	$1,150	$805	$0	$0	$2,154	$180	$41.43	$9.37
RAIL ONLY	$460	$0	$0	$0	$0	$460	$38	$8.85	$2.00

TRANSIT COMMUTE VIA : Metrorail Orange Line from Ballston to Farragut West; assumes 230 commuting days.

CAR DRIVING COSTS : gas, tires, oil, and non-scheduled maintenance and repairs.
CAR OWNERSHIP COSTS : depreciation, scheduled maintenance, accessories, insurance, and local and state vehicle registration, titling, and safety and emissions inspection fees and taxes.

MVTC: 07/31/86

FREE COMMUTING $$$$ ESTIMATE

The Northern Virginia Transportation Commission provides a free personalized report that compares the costs of the commuting options available to you--such as driving, Metrorail, bus, or carpool. Simply provide as much information as you can below, and either mail this postage-paid form to NVTC or call us directly at 524-3322.

1. NAME: SARAH JOHNSON DAY PHONE: _____

2. RESIDENT OF: __Alexandria __Fairfax City __Prince William
✓Arlington __Falls Church __Loudoun
__Fairfax Co. Other _____

3. HOME ADDRESS: _____, ARLINGTON, VA ZIP: 22201

4. WORK ADDRESS: 1850 E/E St, NW, WASHINGTON, DC ZIP: 20006

5. DISTANCE TO WORK: 7 (miles from home)

6. PARKING FEE: $ 3.50 : __per month ✓per day

7. DULLES TOLLS: $ — (round-trip)

8. COMMUTING CAR: MODEL BUICK SOMERSET REGAL YEAR: 1985
(e.g., Ford Escort - 1985)

9. CAR SIZE: __Subcompact __Compact __Intermediate __Large
__Passenger Van

10. MARKET VALUE: $? 9,000 (book value, if known)

11. PRICE WHEN NEW: $ 11,000 (if known)

12. INSURANCE: $ 350 (annual premium)

13. MPG TO WORK: 20 (miles per gallon)

14. PRICE OF GAS: $ 0.91 ($0.00 per gallon)

15. If you must keep the car or van for reasons other than work-related travel, what percent, if any, of the costs of owning that vehicle should be charged to your work commute? 50 %

16. If you need to use a car to get to: __Metrorail station or __bus stop

_____Miles from home to _____
_____(Station/bus: name or number).

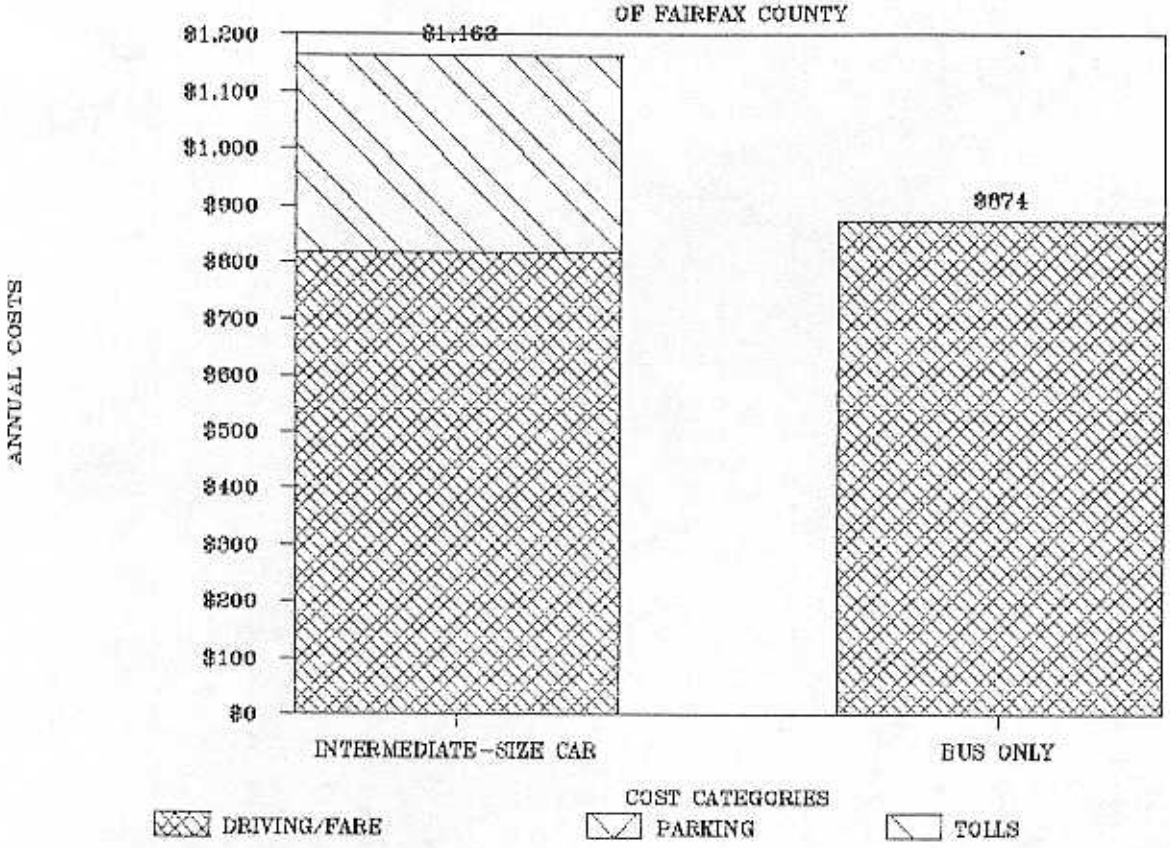
__Car is parked. __Car is driven home by someone else.
__Car is driven elsewhere by someone else.

17. If you are considering (or have been) carpooling or vanpooling, how would you share the costs of commuting?

_____Number in your car or vanpool--including yourself.
Each rider would pay a monthly fee of: $_____.

COMMUTING COSTS FOR HARRY MITCHELL

OF FAIRFAX COUNTY



COMMUTING COSTS FOR HARRY MITCHELL
OF FAIRFAX COUNTY

FROM : NORTH RESTON
TO : PENTAGON

*** WITH 0 % OF CAR OWNERSHIP COSTS ALLOCATED TO COMMUTING ***

ANNUAL COSTS	CAR DRIVING COSTS OR TRANSIT FARE	CAR OWNERSHIP COSTS	PARKING FEES	BULLES TOLLS	CAR TO TRANSIT DRIVING COSTS	ANNUAL COMMUTING COST	MONTHLY COMMUTING COST	WEEKLY COMMUTING COST	DAILY COMMUTING COST
INTERMEDIATE-SIZE CAR	$818	$0	$0	$345	$0	$1,163	$97	$22.37	$5.06
BUS ONLY	$874	$0	$0	$0	$0	$874	$73	$16.81	$3.80

TRANSIT COMMUTE VIA : Metrobus SN to Pentagon; assumes use of VA-4-zone flashpass and 230 commuting days.

CAR DRIVING COSTS : gas, tires, oil, and non-scheduled maintenance and repairs.
CAR OWNERSHIP COSTS : depreciation, scheduled maintenance, accessories, insurance, and local and state vehicle registration, titling, and safety and emissions inspection fees and taxes.

NVTC: 07/31/86

FREE COMMUTING $$$$ ESTIMATE

The Northern Virginia Transportation Commission provides a free personalized report that compares the costs of the commuting options available to you--such as driving, Metrorail, bus, or carpool. Simply provide as much information as you can below, and either mail this postage-paid form to NVTC or call us directly at 524-3322.

1. NAME: HARRY MITCHELL DAY PHONE: _____

2. RESIDENT OF:
__Alexandria __Fairfax City __Prince William
__Arlington __Falls Church __Loudoun
✓Fairfax Co. Other _____

3. HOME ADDRESS: _____, FAIRFAX, VA ZIP: 22090

4. WORK ADDRESS: PENTAGON ZIP: 20301

5. DISTANCE TO WORK: 20 (miles from home)

6. PARKING FEE: $ 0 : __per month __per day

7. DULLES TOLLS: $ 1.50 (round-trip)

8. COMMUTING CAR: MODEL OLDS CUTLASS SUPREME YEAR: 1983
(e.g., Ford Escort - 1985)

9. CAR SIZE: __Subcompact __Compact ✓Intermediate __Large
__Passenger Van

10. MARKET VALUE: $ 6,500 (book value, if known)

11. PRICE WHEN NEW: $ 16,000 (if known)

12. INSURANCE: $ 300 (annual premium)

13. MPG TO WORK: 20 (miles per gallon)

14. PRICE OF GAS: $ 0.91 ($0.00 per gallon)

15. If you must keep the car or van for reasons other than work-related travel, what percent, if any, of the costs of owning that vehicle should be charged to your work commute? 0 %

16. If you need to use a car to get to: __Metrorail station or __bus stop

_____Miles from home to _____
_____(Station/bus: name or number).

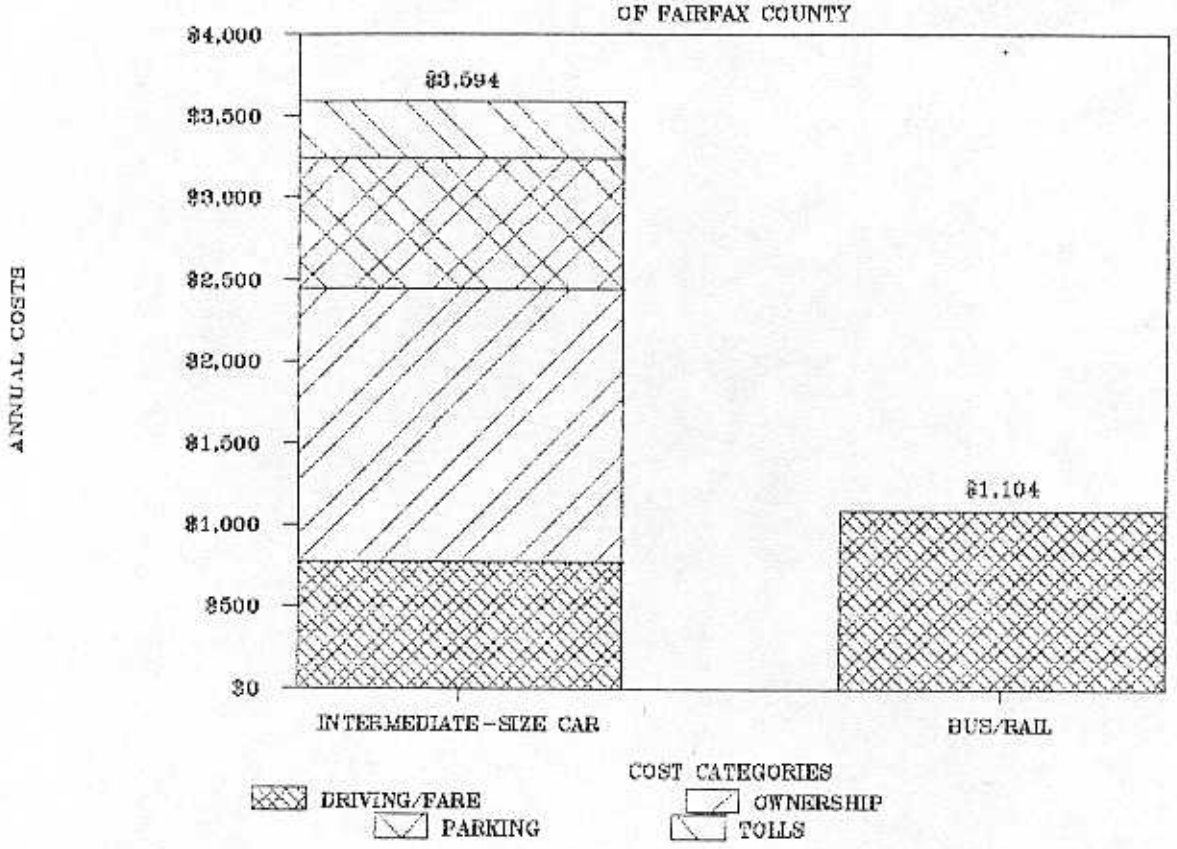
__Car is parked. __Car is driven home by someone else.
__Car is driven elsewhere by someone else.

17. If you are considering (or have been) carpooling or vanpooling, how would you share the costs of commuting?

_____Number in your car or vanpool--including yourself.
Each rider would pay a monthly fee of: $_____.

COMMUTING COSTS FOR ROY PIERCE

OF FAIRFAX COUNTY



COMMUTING COSTS FOR ROY PIERCE
OF FAIRFAX COUNTY

FROM : NORTH RESTON
TO : FARRAGUT WEST

*** WITH 100 % OF CAR OWNERSHIP COSTS ALLOCATED TO COMMUTING ***

ANNUAL COSTS	CAR DRIVING COSTS OR TRANSIT FARE	CAR OWNERSHIP COSTS	PARKING FEES	DULLES TOLLS	CAR TO TRANSIT DRIVING COSTS	ANNUAL COMMUTING COST	MONTHLY COMMUTING COST	WEEKLY COMMUTING COST	DAILY COMMUTING COST
INTERMEDIATE-SIZE CAR	$777	$1,667	$805	$345	$0	$3,594	$300	$69.12	$15.63
BUS/RAIL	$1,104	$0	$0	$0	$0	$1,104	$92	$21.23	$4.80

TRANSIT COMMUTE VIA : Metrobus 5A to W. Falls Church Metrorail station then Orange Line to Farragut West station. Assumes use of Virginia 2-Zone Flashpass and 230 commuting days.

CAR DRIVING COSTS : gas, tires, oil, and non-scheduled maintenance and repairs.

CAR OWNERSHIP COSTS : depreciation, scheduled maintenance, accessories, insurance, and local and state vehicle registration, titling, and safety and emissions inspection fees and taxes.

NVTC: 07/01/86

FREE COMMUTING $$$$ ESTIMATE

The Northern Virginia Transportation Commission provides a free personalized report that compares the costs of the commuting options available to you--such as driving, Metrorail, bus, or carpool. Simply provide as much information as you can below, and either mail this postage-paid form to NVTC or call us directly at 524-3322.

1. NAME: ROY PIERCE DAY PHONE: ?

2. RESIDENT OF: __Alexandria __Fairfax City __Prince William
__Arlington __Falls Church __Loudoun
✓Fairfax Co. Other _____

3. HOME ADDRESS: _____ FAIRFAX, VA ZIP: 22090

4. WORK ADDRESS: 1850 EYE ST, NW, WASHINGTON, DC ZIP: 20006

5. DISTANCE TO WORK: 19 (miles from home)

6. PARKING FEE: $ 3.50 : __per month ✓per day

7. DULLES TOLLS: $ 1.50 (round-trip)

8. COMMUTING CAR: MODEL MERCURY MARQUIS YEAR: 1983
(e.g., Ford Escort - 1985)

9. CAR SIZE: __Subcompact __Compact ✓Intermediate __Large
__Passenger Van

10. MARKET VALUE: $ 5,800 (book value, if known)

11. PRICE WHEN NEW: $ 10,000 (if known)

12. INSURANCE: $ 300 (annual premium)

13. MPG TO WORK: 20 (miles per gallon)

14. PRICE OF GAS: $ 0.91 ($0.00 per gallon)

15. If you must keep the car or van for reasons other than work-related travel, what percent, if any, of the costs of owning that vehicle should be charged to your work commute? _____%

16. If you need to use a car to get to: __Metrorail station or __bus stop

_____Miles from home to _____
_____(Station/bus: name or number).

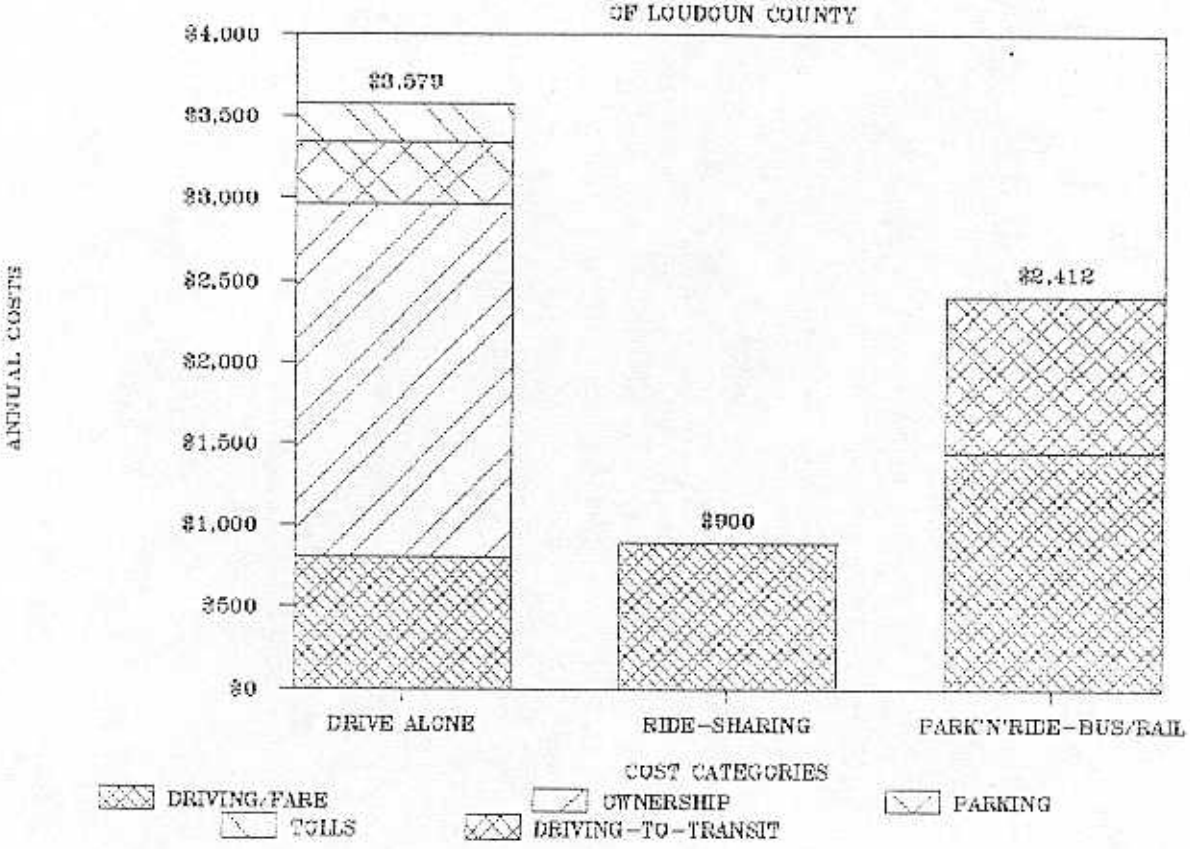
__Car is parked. __Car is driven home by someone else.
__Car is driven elsewhere by someone else.

17. If you are considering (or have been) carpooling or vanpooling, how would you share the costs of commuting?

_____Number in your car or vanpool--including yourself.
Each rider would pay a monthly fee of: $_____.

COMMUTING COSTS FOR MARY E. TAYLOR

OF LOUDOUN COUNTY



COMMUTING COSTS FOR MARY E. TAYLOR
OF LOUDOUN COUNTY

FROM : LEESBURG
TO : ARLNG. COURTHOUSE

*** WITH 75 % OF CAR OWNERSHIP COSTS ALLOCATED TO COMMUTING ***

ANNUAL COSTS	CAR DRIVING COSTS OR TRANSIT FARE	CAR OWNERSHIP COSTS	PARKING FEES	DULLES TOLLS	CAR TO TRANSIT DRIVING COSTS	ANNUAL COMMUTING COST	MONTHLY COMMUTING COST	WEEKLY COMMUTING COST	DAILY COMMUTING COST
DRIVE ALONE	$810	$2,155	$384	$230	$0	$3,579	$298	$68.83	$15.56
RIDE-SHARING	$900	$0	$0	$0	$0	$900	$75	$17.31	$3.91
PARK'N'RIDE-BUS/RAIL	$1,449	$0	$0	$0	$963	$2,412	$201	$46.38	$10.49

TRANSIT COMMUTE VIA : Drive 30 miles to commuter bus in Sterling; buy 10-ride ticket card for $26 and ride to Rosslyn; take Metrorail Orange Line to Courthouse station; assumes 230 commuting days.

CAR DRIVING COSTS : gas, tires, oil, and non-scheduled maintenance and repairs.

CAR OWNERSHIP COSTS : depreciation, scheduled maintenance, accessories, insurance, and local and state vehicle registration, titling, and safety and emissions inspection fees and taxes.

MWTC: 07/22/86

FREE COMMUTING $$$$ ESTIMATE

The Northern Virginia Transportation Commission provides a free personalized report that compares the costs of the commuting options available to you--such as driving, Metrorail, bus, or carpool. Simply provide as much information as you can below, and either mail this postage-paid form to NVTC or call us directly at 524-3322.

1. NAME: MARY E. TAYLOR DAY PHONE: _____

2. RESIDENT OF: __Alexandria __Fairfax City __Prince William
__Arlington __Falls Church X Loudoun
__Fairfax Co. Other _____

3. HOME ADDRESS: _____, LEESBURG, Apt N/ ZIP: 22075

4. WORK ADDRESS: 2009 N. 14TH St., ARLINGTON, VA ZIP: 22201

5. DISTANCE TO WORK: 38 (miles from home)

6. PARKING FEE: $ 32.00 : ✓per month __per day

7. DULLES TOLLS: $ 1.00 (round-trip)

8. COMMUTING CAR: MODEL _____ YEAR: 1985
(e.g., Ford Escort - 1985)

9. CAR SIZE: __Subcompact ✓Compact __Intermediate __Large
__Passenger Van

10. MARKET VALUE: $ 12,000 (book value, if known)

11. PRICE WHEN NEW: $ 14,000 (if known)

12. INSURANCE: $ 408.30 (annual premium)

13. MPG TO WORK: 30 (miles per gallon)

14. PRICE OF GAS: $ 0.90 ($0.00 per gallon)

15. If you must keep the car or van for reasons other than work-related travel, what percent, if any, of the costs of owning that vehicle should be charged to your work commute? 75 %

16. If you need to use a car to get to: __Metrorail station or ✓bus stop

30 Miles from home to STERLING FOR BUS TO RUSSLYN (Station/bus: name or number).

X Car is parked. __Car is driven home by someone else.
__Car is driven elsewhere by someone else.

17. If you are considering (or have been) carpooling or vanpooling, how would you share the costs of commuting?

4 Number in your car or vanpool--including yourself.
Each rider would pay a monthly fee of: $75.00.

APPENDIX F

INVENTORY OF NVTC RIDERSHIP REPORTS

COMPREHENSIVE INVENTORY

LAST UPDATE: 8/11/86

LINE NO.	ROUTES	LINE NAME	NVTC RIDERSHIP REPORT AVAILABLE (BY DATE OF SURVEY) WEEKDAY	SATURDAY	SUNDAY
1	BCDEFGVZ	WILSON BLVD - FAIRFAX	NO	NO	NO
1	(ABDEHNVW)	WILSON BLVD - ANNANDALE	9-10/83	NO	NO
1	(CFXZ)	WILSON BLVD - FAIRFAX	11/83-1/84	NO	NO
2	ABC	WASHINGTON BLVD	NO	NO	NO
2	(ABCEFK)	WASHINGTON BLVD	3-4/84	NO	NO
2	JFX	VIENNA - OAKTON	NO	---	---
2	(VWX)	TYSONS CORNER - OAKTON EXPRESS	3-4/84	---	---
3	ABCE	LEE HIGHWAY	NO	NO	NO
3	(ABCEFX)	LEE HIGHWAY	4/84	3/85 (A-F)	3/85 (E-F)
3	NZ	WESTPARK - WEST FALLS CHURCH	NO	---	---
3	(Z)	TYSONS CORNER - BALLSTON EXPRESS	4/84	---	---
4	ABEHS	PERSHING DR - ARLINGTON BLVD	3/84	NO	NO
4	C	CULHOSE - BALLSTON			
5	ABJ	RESTON NORTH	NO	---	---
5	CDEFGH	RESTON SOUTH	NO	---	---
5	NP	RESTON - CRYSTAL CITY	NO	---	---
5	S	HERNDON - WEST FALLS CHURCH	NO	NO	NO
5	(S)	HERNDON - BALLSTON	10/84	11/84	---
5	Y	HERNDON EXPRESS	NO	---	---
6	ADFG	BRADLEE - SOUTH FAIRLINGTON	NO	NO	NO
7	ACEFHPWX	LINCOLNIA - NORTH FAIRLINGTON	NO	NO	NO
7	(ACEFWX)	LINCOLNIA - NORTH FAIRLINGTON	3-6/84	NO	NO
8	WXZ	FOXCHASE - SEMINARY VALLEY	8/84	---	---
9	AE	FORT BELVOIR - PENTAGON	5/85	7/85 (A)	7/85 (A)
9	(ABCDE)	FORT BELVOIR - PENTAGON	4/84	NO	NO
9	(WXYZ)	RICHMOND HIGHWAY	4/84	NO	---
10	ABCE	ALEXANDRIA - ARLINGTON - PENTAGON	NO	NO	NO
11	HPXY	MOUNT VERNON	NO	NO	NO
12	C	CENTREVILLE EXPRESS	NO	NO	NO
13	ABCDEFG	NAT AIRPORT - PENTAGON - WASHINGTON	2/86 (ABCD)	NO	NO
13	(ABCDEFG)	NAT AIRPORT - PENTAGON - WASHINGTON	7/83	7/83 (A,B)	7/83 (A,B)

LINE NO.	ROUTES	LINE NAME	NVTC RIDERSHIP REPORT AVAILABLE (BY DATE OF SURVEY) WEEKDAY	SATURDAY	SUNDAY
15	KLM	CHAIN BRIDGE ROAD	NO	---	---
	(5 - KLM)	CHAIN BRIDGE ROAD	7/85	---	---
	(5 - KM)	CHAIN BRIDGE ROAD	11/83-1/84	---	---
16	ABCDEFL	COLUMBIA PIKE	4/84	NO	NO
16	UWX	SHIRLINGTON - PENTAGON	NO	---	---
17	ABFGHKLM	KINGS PARK	NO	---	---
17	(ABC)	KINGS PARK	1/84	---	---
17	(GHKLM)	KINGS PARK	NO	---	---
18	ABDEF	SPRINGFIELD	NO	---	---
18	(ADEFGM)	SPRINGFIELD	12/83-1/84	---	---
18	GHJKLPR	ORANGE HUNT - BURKE CENTER	NO	---	---
18	(BCHKLPR)	ORANGE HUNT - BURKE CENTER	12/83-1/84	---	---
19	L	LORTON EXPRESS	1/86	---	---
20	YZ	CHANTILLY - GREENBRIAR	NO	---	---
21	ABF	LANDMARK EXPRESS	NO	---	---
21	(ABF)	LANDMARK EXPRESS	11/84	---	---
22	ABF	WALKER CHAPEL - SHIRLINGTON	NO	---	---
22	(ABCG)	WALKER CHAPEL - SHIRLINGTON	2-3/85	---	---
22	(ABCG)	WALKER CHAPEL - SHIRLINGTON	4/82	---	---
23	ACT	McLEAN - CRYSTAL CITY	NO	NO	NO
23	(AMNT)	GLEBE ROAD	7/85	NO	NO
23	(AMNT)	GLEBE ROAD	1/83	NO	NO
23	X	GREAT FALLS	NO	---	---
24	E	SEVEN CORNERS - PENTAGON	NO	NO	---
24	T	McLEAN HAMLET - EAST FALLS CHURCH	NO	---	---
24	(ABEFT)	TYSONS CORNER - PENTAGON	2/85	---	---
24	(ABEFT)	TYSONS CORNER - PENTAGON	5/82	---	---
25	AB	LANDMARK - BALLSTON	3/84	NO	---
26	(A)	TYSONS CORNER - SPRINGFIELD MALL	5/83	NO	---
26	T	TYSONS CORNER - SPRINGFIELD MALL	NO	NO	---

LINE NO.	ROUTES	LINE NAME	HVTC RIDERSHIP REPORT AVAILABLE (BY DATE OF SURVEY) WEEKDAY	SATURDAY	SUNDAY
27	BC	FRANCONIA - PENTAGON	NO	---	---
27	(BC)	FRANCONIA - PENTAGON	6/84 (B)	---	---
27	G	HAYFIELD - PENTAGON	5-7/85	---	---
27	(G)	HAYFIELD - PENTAGON	6/84	---	---
27	(H)	HAYFIELD - HUNTINGTON	6/84	---	---
27	YZ	SARATOGA	NO	---	---
27	(Z)	SARATOGA	1/81	---	---
28	A8	ALEXANDRIA - TYSONS CORNER	7/85	10-11/85	10-11/85
28	(A6)	ALEXANDRIA - TYSONS CORNER	5-6/84	NO	NO
28	FG	SKYLINE CITY	NO	---	---
29	BCEFGHX	ANNANDALE	4-5/84	---	---
29	KLNN	ALEXANDRIA - FAIRFAX	4-5/84	NO	NO
38	B	BALLSTON - FARRAGUT SQUARE	NO	11/84	11/84

() Route or line service has been altered or discontinued.
-- Not applicable to this line.
? Status unknown.