

EXECUTIVE SUMMARY



FIRST ANNUAL REPORT

NORTHERN VIRGINIA TRANSPORTATION COMMISSION

September 1985

ABSTRACT

The first annual report of the Northern Virginia Transportation Commission's Bus Service Coordination Plan emphasizes the new products and processes that have been completed or are in progress. During the first year, staff effort has been devoted to gathering data, defining processes, and producing prototype products. The results of this effort are reported in full in this document. During the second year of the process, the emphasis will shift to implementation. Commissioners and staff should expect to work together to apply the tools that have now been developed, in order to achieve measurable improvements in bus service coordination.

NVTC adopted three general goals for its plan in February 1984:

- 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.

A detailed scope of work was approved in July 1984. The scope of work identified an initial year-long program which would culminate in the first of a series of annual reports. For the first two years, the continuing coordination process would be focussed on the pending opening of Metrorail's Orange Line to Vienna, and the resulting need to substantially reorient bus service in that part of the region.

Planning activities during the first year consisted of two major parts. First, existing resources were described, evaluated, and made more accessible to planners and the public. To accomplish this task, NVTC purchased a sophisticated micro computer system and initiated a wide range of activities designed to improve access to public transportation resources. Second, new initiatives for promotion of transit and enhanced coordination were undertaken. These activities sought improvements in planning, operations, and marketing, and included service demonstrations.

A limited number of copies of the complete first annual report can be obtained from the Commission on request.

INTRODUCTION

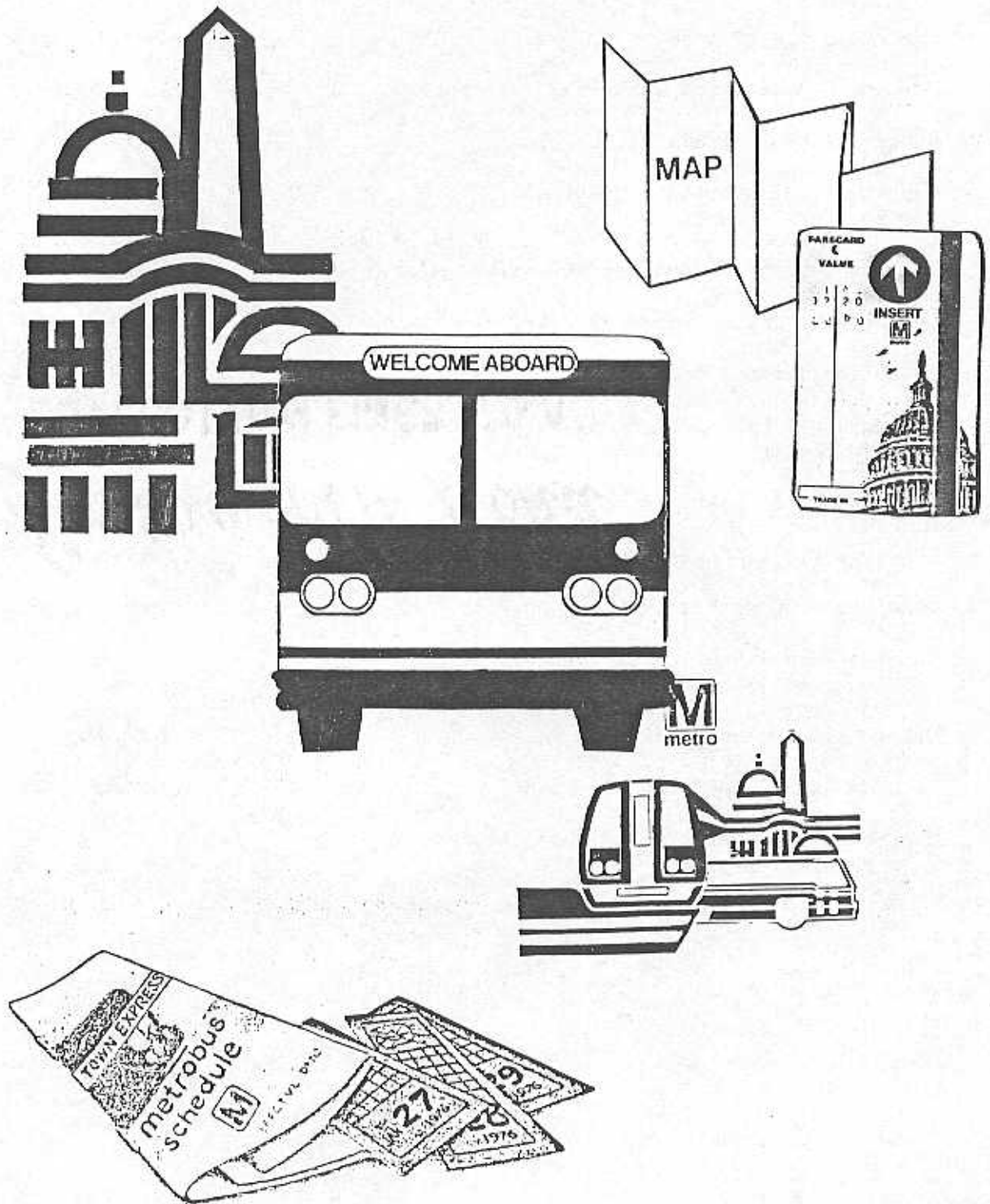


Figure 1

SCHEDULE OF BUS SERVICE COORDINATION PLAN ACTIVITIES

Approve Goals	February 1984
Approve Scope of Work	July 1984
Develop Computerized Marketing Inventory	August 1984
Develop Technical Abstracts Files	September 1984
Convene First Quarterly Meeting of Operators' Council	September 1984
Develop Technical Productivity Files	October 1984
Organize Planning Process for Vienna Opening	October 1984
Establish Transit Database	February 1985
Review Draft Plan for Vienna-Related Bus Adjustments	June 1985
Convene Public Meetings re Vienna	September 1985
Complete First Annual Report on Bus Plan	September 1985
Complete NVTC Marketing Plan	December 1985
Conduct Formal Public Hearings on Revised Vienna Adjustments	January 1986
Orange Line Opens to Vienna	June 1986
Second Annual Report on Bus Plan	September 1986
Complete Implementation of Connections Marketing Campaign	December 1986

INTRODUCTION

To produce the Bus Service Coordination Plan, the Commission, in close cooperation with its member jurisdictions, devised the schedule of activities shown in Figure 1. The schedule includes actions in each of the two major elements of the Plan, including:

- o Improving access to public transportation resources in Northern Virginia; and
- o Initiatives for promotion of transit and enhanced coordination.

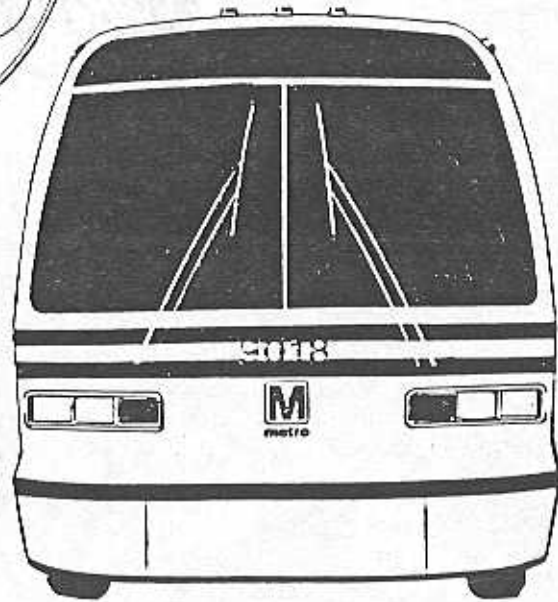
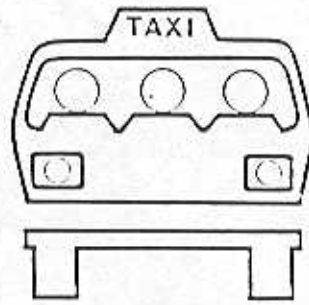
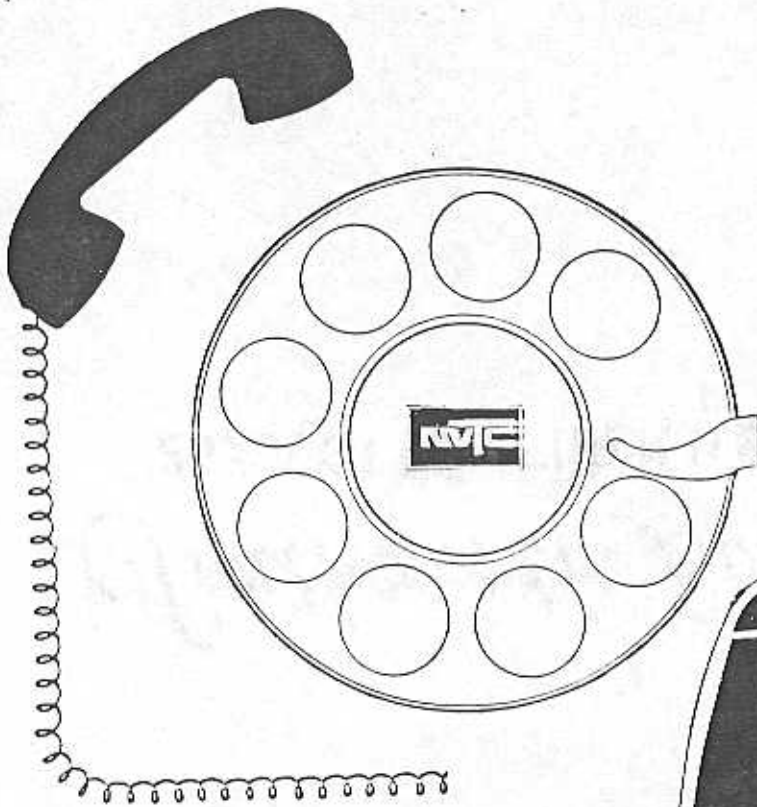
The most important contribution made by the Plan is a set of new products. These are listed in Figure 2.

Figure 2

SUMMARY OF NEW NVTC BUS SERVICE COORDINATION PRODUCTS

<u>Product</u>	<u>Page Number</u>
NVTC Subsidy Allocation Model	5
NVTC Research Abstracts File	6
NVTC Transit Marketing Inventory	7
Cooperative Planning Process for Orange Line Opening to Vienna	9
NVTC/COG Census Data Mapping Project and Regional Transit Database	12
NVTC Service Request File	13
DC/Virginia Employment Initiative	14
Northern Virginia Transit Operators' Council	16
NVTC Productivity Inventory	17
NVTC Ridership Reports	18
NVTC's Automated Performance Evaluation and Sensitivity Testing System for Fairfax County	19
NVTC Transit Performance Monitoring	20
NVTC Transit Connection Campaign	21
NVTC Market Research	23
NVTC Marketing Plan	25
NVTC's Model of Net Auto Versus Transit Costs	27

IMPROVING ACCESS
TO PUBLIC TRANSPORTATION
RESOURCES IN
NORTHERN VIRGINIA



IMPROVING ACCESS TO PUBLIC TRANSPORTATION RESOURCES IN NORTHERN VIRGINIA

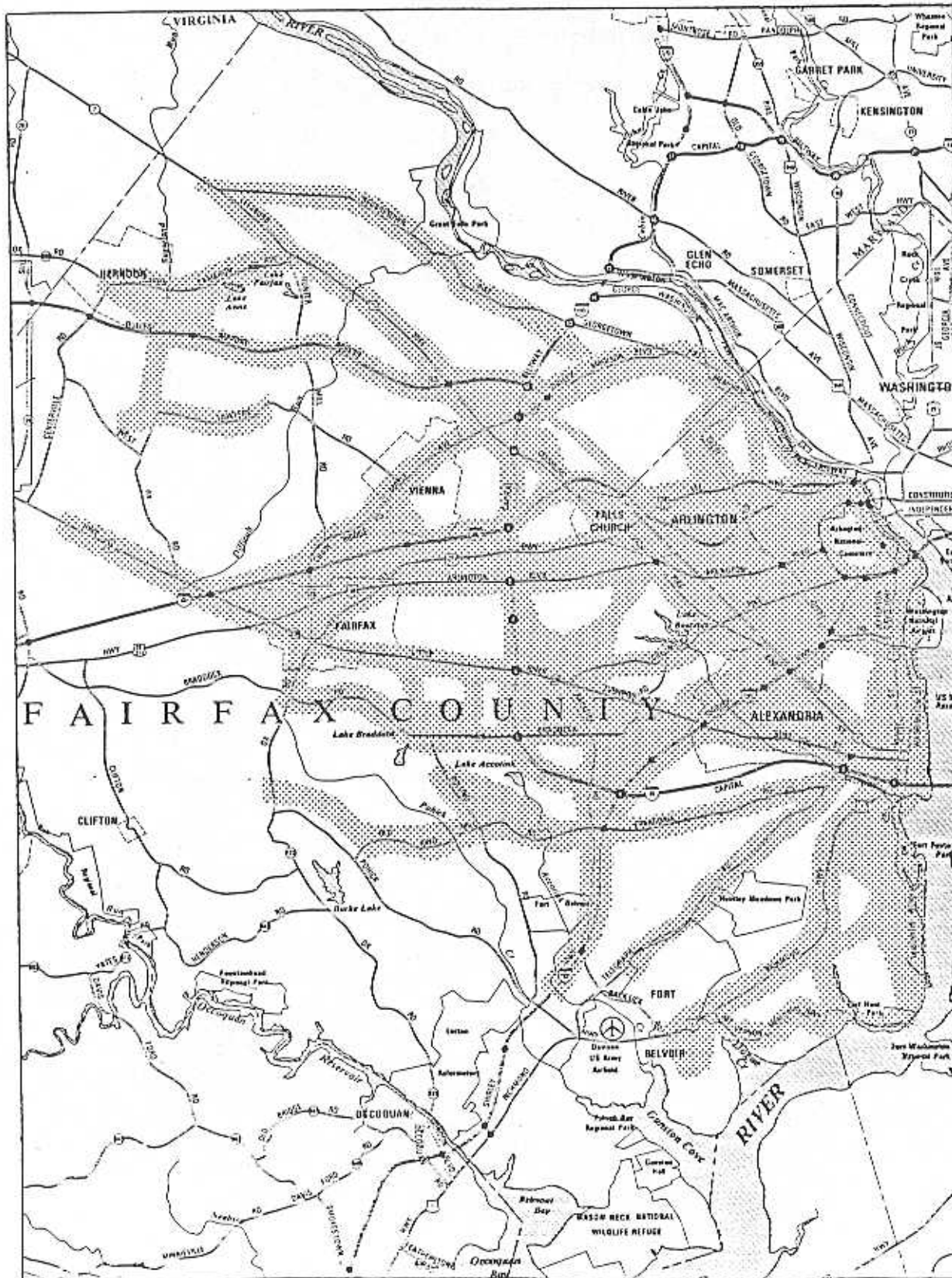
Each of NVTC's five jurisdictions maintains a staff of experts to gather data, analyze alternatives, and recommend actions to address transportation issues. The Metropolitan Washington Council of Governments/Transportation Planning Board maintains databases and has extensive computer resources with which it studies regional transportation and makes forecasts. The area is rich in universities and consulting firms with technical expertise. The Washington Metropolitan Area Transit Authority (Metro) itself has over 7000 employees who plan, administer, and deliver bus and rail services.

Because of the abundance of resources devoted to planning, analysis, and provision of public transportation in Northern Virginia, it is difficult for most citizens, elected officials, and jurisdiction staff to become familiar with the entire array. As a result, decisions may be made without utilizing the most recent data or the best analysis techniques. If there were a means to better organize the existing information, and to make a wider audience aware of the richness and diversity of public transportation resources in the region, an excellent contribution would be made to informed decision making.

An important aspect of NVTC's Bus Service Coordination Plan is to accomplish just such an accounting of existing public transportation resources. In the course of doing so, where gaps or conflicts are found to exist among data or methods applied by various jurisdictions, these should be identified and solutions proposed.

Figure 3

METROBUS SERVICE AREAS IN NORTHERN VIRGINIA



Public Transportation Systems in Northern Virginia

Northern Virginia does have a well-developed network of public transit routes, including Metrorail and Metrobus, and--increasingly--local and private bus services. The growth of these systems has occurred without much concern for gaps or overlaps in service areas and policies. As a result, NVTC has initiated its Bus Service Coordination Plan. Figures 3 and 4 show the Metrobus and Metrorail systems, respectively.

If public transit did not exist in Northern Virginia the region would be choked with autos. An additional seven lanes of expressway would be needed in each direction just to funnel commuters into the District of Columbia and back again. This would be an impossible undertaking. Accordingly, it is imperative that Metrobus routes be well structured, and its facilities used to their best advantage. Further, it is essential that local bus services be integrated with Metro routes to provide a continuous transit network.

An estimated 235,000 transit-trips are taken in Northern Virginia each weekday, including buses and Metrorail. As of 1983, the most recent year for which data are available, transit served about a fifth of the trips between Northern Virginia and core locations (the District of Columbia, Rosslyn, Pentagon, and Crystal City). Ridesharing added another two-fifths, with single-occupant autos comprising the remainder.

Locally sponsored service is provided by Alexandria's 17-bus DASH system, which has been in operation since March 1984, and by Fairfax City's CUE bus and Gold Line express. Fairfax County initiated in late September 1985, a 33-bus feeder system, known as the Fairfax Connector and serving the Huntington Metrorail station.

Figure 4

July 1985

Status of 103 mile Metro system

Terminal stations on completed system

- Red Line—Glenmont/Shady Grove
- Blue Line—Addison Road/Huntington
- Orange Line—New Carrollton/Vienna
- Green Line—Greenbelt/Branch Avenue
- Yellow Line—Franconia-Springfield/Mount Vernon Square-UDC



LEGEND

- Operating Lines 60.46 miles 60 stations
- Under Construction 13.93 miles 8 stations
- Under Final Design 18.68 miles 11 stations
- Remainder of System 9.89 miles 8 stations

Total mileage—102.96
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

1986 Projected start of operations for this segment based on approved schedule. Applies to all stations inbound from this point.



Washington Metropolitan Area Transit Authority
600 Fifth Street, N.W., Washington, D.C. 20001

Office of Public Affairs
Paul Willis, Editor
817-1047

Sources and Uses of Transit Funds in Northern Virginia

As shown in Figure 5, there are several sources of funding to support transit in Northern Virginia, including passenger revenues and Federal, state and local assistance. Farebox revenues now cover almost half of transit operating costs in the region. Northern Virginia's transit riders contributed about \$50.6 million in bus and rail fares in FY 1985. The remainder of operating costs, and all capital and construction costs, must be met from government subsidies. In FY 1985, the total capital, operating, and construction costs of transit service provided in Northern Virginia were about \$249 million.

The Virginia General Assembly appropriated \$20.6 million in transit aids for NVTC in FY 1985, and \$21.1 million will be available in FY 1986. In addition, a two percent state tax is applied to motor fuels sold in Northern Virginia, with the proceeds (about \$9-10 million annually) made available to NVTC.

The remaining external source of transit aids is the Federal government. Section 9 of the Urban Mass Transportation Act as amended, now provides less than \$5 million annually to support operations in Northern Virginia, and the continued availability of this amount is in doubt, considering the efforts of the Reagan Administration to reduce Federal operating aids. The loss of this portion of Federal aid would amount to about 10 cents per passenger. In addition, for FY 1985, about \$8.0 million in Federal aids supported rail and bus capital (rolling stock) costs assessed to Northern Virginia. Finally, of about \$250 million available for Metrorail construction from the Federal government, approximately \$97.3 million supported Northern Virginia activities.

Figure 5
 USES AND SOURCES OF FUNDS
 TO SUPPORT METRORAIL AND
 BUS OPERATIONS, CAPITAL AND CONSTRUCTION
 PROGRAMS IN NORTHERN VIRGINIA

(FY 1983-1985)

--\$Millions--

	<u>FY 1983</u>	<u>FY 1984</u>	<u>FY 1985*</u>
USES OF FUNDS			
Operating Costs			
Bus	\$ 56.5	\$ 57.1	\$ 60.7
Rail	34.1	38.0	42.3
Subtotal	<u>90.6</u>	<u>95.1</u>	<u>103.0</u>
Debt Service	7.2	7.5	7.5
Capital Costs			
Bus and Rail	18.9	21.9	16.6
Rail			
Construction	<u>115.0</u>	<u>108.0</u>	<u>121.6</u>
Total Uses	\$232.7	\$232.5	\$248.7
SOURCES OF FUNDS			
Operating Revenues			
Bus	\$ 21.1	\$ 19.2	\$ 20.7
Rail	17.6	23.3	29.9
Subtotal	<u>38.7</u>	<u>42.5</u>	<u>50.6</u>
Federal Grants			
Capital	13.8	17.0	8.0
Operating	4.8	4.8	4.8
Stark-Harris	92.8	86.4	97.3
State Aid	20.6	21.1	20.6
Regional Motor			
Fuels Tax	9.1	9.7	9.8
Local	<u>52.9</u>	<u>51.0</u>	<u>57.6</u>
Total Sources	\$232.7	\$232.5	\$248.7

*Estimated

NVTC maintains a spreadsheet model with which it analyzes Metro's budget and the costs and revenues of all the locally sponsored transit systems in Northern Virginia. The capability this computer model offers to ask and answer "what if....?" questions is invaluable.

NVTC Research Abstracts File

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XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X                               X
X      NVTC RESEARCH ABSTRACTS FILE      X
X                               X
X  An annotated bibliographic file of    X
X  relevant reports that can be sorted   X
X  by category of interest, such as     X
X  author, date or subject.             X
X                               X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

In order to make it easier to keep abreast of the wealth of plans and related studies, NVTC has created a computerized abstracts file into which relevant regional reports are entered. Each entry is identified by author, title, subject, type of study, and date. A description of the contents is also included. The entries can be sorted by any or all of these criteria, so that researchers can have ready access to annotations regarding existing, ongoing, and planned reports in the areas of greatest interest to them. Use of the abstracts file is available free of charge to interested persons upon request to NVTC. Currently about 125 entries have been catalogued.

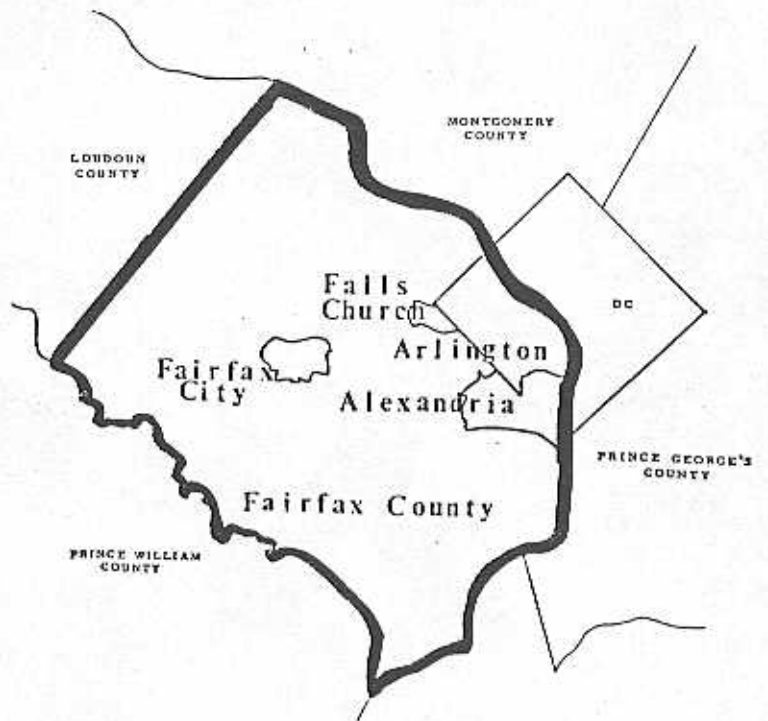
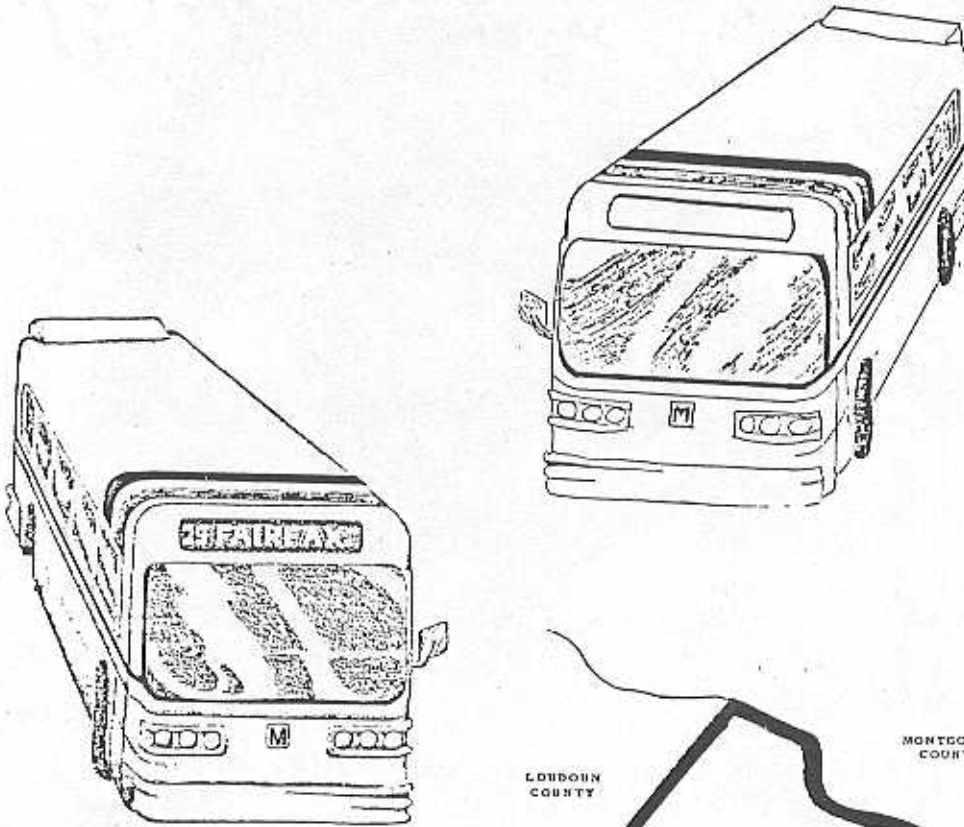
NVTC Transit Marketing Database

```
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X      NVTC TRANSIT MARKETING INVENTORY      X
X
X Over 500 entries are available in      X
X computerized format listing      X
X marketing initiatives from transit      X
X properties around the country. The      X
X inventory is updated weekly, and      X
X can be sorted to produce listings      X
X of particular interest by juris-      X
X diction, date, or type of activity.      X
X      X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
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Another product of the Bus Service Coordination Plan is NVTC's marketing inventory. This computerized listing of successful transit marketing initiatives from around the country over the past several years is updated each week using a wide variety of sources. The data can be sorted automatically by geographic area, approach, date, and transit system. This provides a quick resource for planning and implementing marketing programs based on the experiences of other transit properties. At present the inventory contains over 500 entries.

Among the many uses of NVTC's marketing inventory, the Commission will identify poorly performing bus routes and after analysis of the routes, may seek to boost ridership by application of a focused marketing effort using appropriate techniques that have proven successful elsewhere.

INITIATIVES FOR
PROMOTION OF TRANSIT
AND ENHANCED COORDINATION



INITIATIVES FOR PROMOTION OF TRANSIT AND ENHANCED COORDINATION

As mentioned above, a great deal of information is regularly provided about transportation in Northern Virginia. NVTC has developed improved methods to disseminate some of this information, so that it can be utilized more effectively. Despite the abundance of facts and figures, there are some aspects of the transportation problem that are not well understood. The Commission has identified deficiencies in planning, operations, service evaluation and marketing, which it is seeking to improve with the slate of new procedures and products. NVTC has developed these procedures and products over the last year in close cooperation with staffs of its member jurisdictions.

The focus of the Commission's planning activities has been the opening of Metrorail's Orange Line to Vienna. Four new stations are due to begin service in mid-1986, and Metrobus service in that corridor must be reoriented to provide efficient connections. Fairfax City has ordered five new buses to link its internal circulation transit system to the Vienna station. Commuter bus operators serving outlying Prince William and Loudoun Counties may wish to pick up and discharge passengers at the West Falls Church or Vienna stations, as will the Washington Flyer whose buses serve Dulles and National Airports. At the same time that plans are proceeding to accommodate these diverse systems, it is imperative that the public be given ample opportunity to participate. While Metro scrupulously follows its public hearing requirements, NVTC believes that

Figure 6

SCHEDULE FOR PLANNING AND IMPLEMENTING BUS SERVICE ADJUSTMENTS FOR METRO-RAIL ORANGE LINE EXTENSION TO VIENNA

ACTIVITY	1984			1985			1986					
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT
A. Compile ridership data charts; calculate line and fare impacts (WMATA)												
B. Solicit jurisdiction inputs for planning assumptions (WMATA)												
C. Prepare NYTC Ridership Reports; distribute (NYTC)												
D. Prepare census data for analyzing ridership potential; distribute (NYTC/DCG)												
E. Monitor and advise Fairfax City bus study (JURISDICTIONS/NYTC/WMATA)												
F. Develop initial service plan; distribute (WMATA)												
G. Review initial service plan including Fairfax City findings (MAC)												
H. Revise service plan; distribute (WMATA)												
I. Jurisdictional approval of plan for public meetings (JURISDICTIONS)												
J. Conduct public meetings (JURISDICTIONS/WMATA/NYTC)												
K. Revise plan; distribute (MAC/WMATA)												
L. Jurisdictional approval of plan for public hearings (JURISDICTIONS)												
M. Set public hearing date (WMATA)												
N. Public hearings (WMATA/NYTC)												
O. Revise plan per public comments (MAC/WMATA)												
P. WMATA Board approval of service (WMATA)												
Q. Complete route development work (WMATA)												
R. Complete traffic work (WMATA)												
S. Complete schedule work (WMATA)												
T. Incomplete service adjustments (WMATA)												

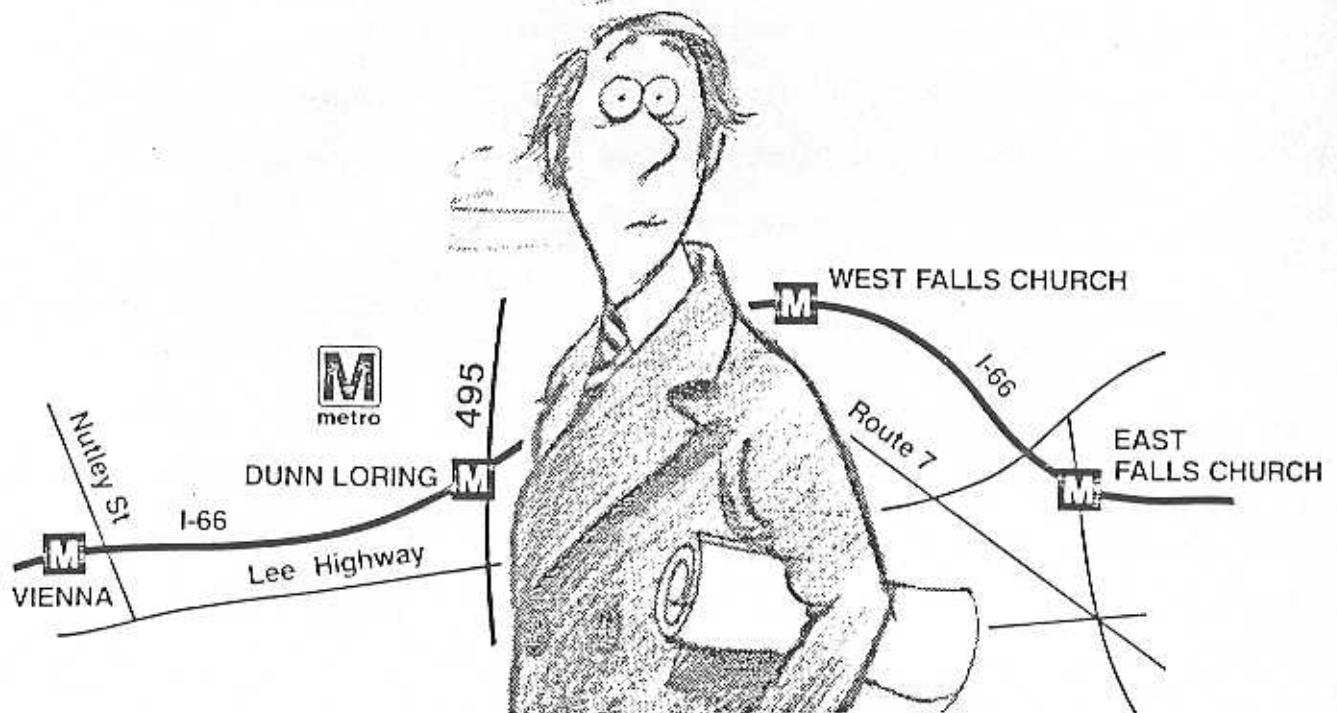
In planning for the Vienna bus service adjustments, a new formal planning mechanism was established by NVTC and its jurisdictions in cooperation with Metro. The growth of local bus systems has complicated the planning process. Also, there is a desire to involve the public earlier, and to utilize better data on potential service areas rather than examining only existing routes. Accordingly, the process that was agreed to attempted to make improvements in all these areas:

- o A formal schedule was set that provided ample time for analysis of markets and review of drafts;
- o A new public meeting series was established prior to the formal public hearings;
- o Fairfax City's local bus feeder system was explicitly included in plans for bus service to the Vienna station; and
- o Private commuter bus operators and outlying jurisdictions were contacted and their desires considered.

Figure 6 illustrates the schedule and tasks that were agreed to by NVTC and its member jurisdictions. They included preparation of ridership data; agreement on assumptions and methods; analysis of census data; development of an initial service plan; review, revision, and informal meetings with the public; and formal approvals and hearings.

By September, a draft plan incorporating initial jurisdiction comments was ready to share with the public at a series of meetings. There is a public desire to be more involved in bus route planning. For example, the Fairfax County Federation of Civic Associations passed on June 21, 1985 a resolution calling for immediate action by WMATA and local jurisdictions to develop a service plan for the Vienna opening "and to hold community meetings prior to public hearings."

Don't Let Us Tell You Where To Go...



Without Telling Us HOW You Want To Go First!

When Metrorail opens between Ballston and Vienna next year, many Metrobus routes will be changed to feed into the new stations. Yours may be one!

But you have some say in the matter first, so here's what to do.

First call the Northern Virginia Transportation Commission at 524-3322 to find out if your route is affected and how. Then, plan to attend one of the following public hearings to voice your views:

- Sept. 18—Falls Church, George Mason Jr./Sr. High School 7:30 p.m.
- Sept. 26—Arlington, Swanson Jr./Sr. High School 7:30 p.m.
- Oct. 9—Oakton High School 7:30 p.m.
- Oct. 10—Reston, Hunters Woods Elementary School 7:30 p.m.

Help Decide How You'll Ride!

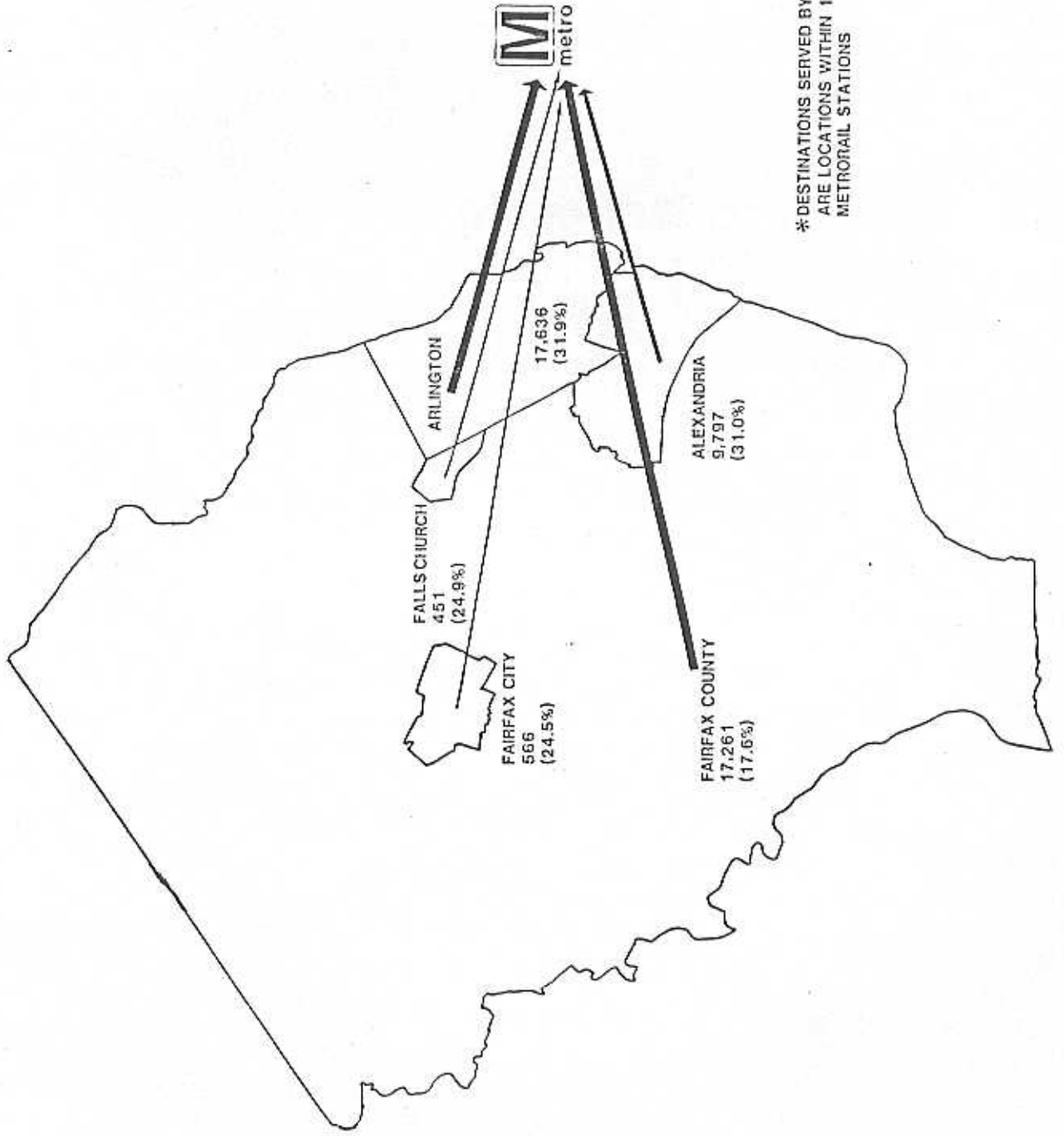


A series of public meetings was held, in Falls Church, Arlington, Oakton and Reston. A copy of the announcement, which appeared in several newspapers and Metrobuses and was mailed to 700 civic associations, is shown in Figure 7. Formats were informal and Metro and jurisdiction staff were present to provide a synopsis of proposed plans. Citizens were encouraged to share their views, and to participate in an exchange of ideas with staff.

The process just described is not unlike the activities preceding earlier Metrorail segment openings; there are two exceptions, however. First, the series of early public meetings is included for the first time. Second, NVTC has automated ridership information and completed a project in which 1980 Census data are mapped for the purpose of clarifying commuters' travel needs and the extent to which existing and proposed Metrobus service is meeting those needs.

Figure 8

DAILY TRANSIT WORK TRIPS
TO DESTINATIONS SERVED BY METRO RAIL
(and transit mode split) 1980 CENSUS



NVTC Census Data Mapping

```
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X                                                                    X
X   NVTC/COG CENSUS DATA MAPPING PROJECT                          X
X   AND REGIONAL TRANSIT DATABASE                                  X
X                                                                    X
X   COG prepared a set of maps and charts                          X
X   to NVTC's specifications using 1980                          X
X   census journey-to-work files, data                            X
X   plotter, and transit network. These                           X
X   showed potential transit markets in                            X
X   terms of residential and employment                           X
X   density, income, and auto ownership,                          X
X   compared to the transit network, in                            X
X   order to determine whether adjustments                         X
X   in the bus system would be productive.                         X
X   NVTC has integrated selected census                           X
X   data into its regional transit data-                           X
X   base which includes ridership reports                          X
X   and other relevant data.                                       X
X                                                                    X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
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The 1980 census contains a wealth of information about travel patterns in the Washington, D.C. metropolitan area. Although five years old, the completeness of the data renders it invaluable in the search for potential new markets to be served by bus. Using a Federal planning grant, NVTC contracted with COG to analyze the census tapes and produce a series of computer-generated maps that would identify travel patterns in Northern Virginia. Using overlays of the bus network, unserved markets could be identified. The results are being utilized to plan improved bus service and to inform the public. A sample product is shown in Figure 8.

Service Request File

```
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X                               X
X      NVTC SERVICE REQUEST FILE      X
X  A process to record requests for   X
X  new bus service received from     X
X  citizens, provide a permanent record X
X  and follow-up to keep citizens in- X
X  formed.                            X
X                                     X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

Citizens that desire new or improved transit service may not know where to turn for help. Usually they begin with their local elected officials, or local transportation staff, or Metro. During a formal hearing, of course, public comments become a part of the official record, and planners do welcome the views of citizens. However, the volume of requests for new service outside of the formal hearing process is not now recorded, and as a consequence, useful ideas may be lost to future planners.

NVTC has begun a procedure by which it will receive such requests (either directly from citizens or indirectly from jurisdiction staffs or elected officials), refer them to the appropriate agency for action, and in some cases, analyze the request and offer suggestions for its implementation. Most important, a permanent computerized record will be kept in a service request file which will be available to jurisdiction and Metro staff, and follow-up efforts will be made to see that the request has been considered and that the person making the request has been informed of the determination.

Northern Virginia is prospering. Employment in most jurisdictions is growing rapidly. At the same time unemployment within the District of Columbia remains high, and a pool of potential service workers is largely untapped. Given this situation, officials in the District of Columbia and Northern Virginia have agreed to cooperate to bring workers together with employers. An obvious constraint to the success of the program is the need to transport persons between their homes in D.C. and the job sites in Virginia. In the case of the W-3 Metrobus Route just discussed, NVTC was able to initiate a route to serve Virginia-based employees working in D.C. However, such a trip is consistent with the predominant flow of commuters. In the case of the new jobs program, a "reverse commute" is called for, in which persons are moving counter to the peak flow of commuters.

While some bus service is scheduled opposite to the peak flow, additional capacity is available, since many buses "dead-head" (travel empty) back to the beginning of their routes to commence the next revenue trip toward the District in the morning (and the opposite in the afternoon). In many cases the volume of workers likely to participate in the new program may be so slight as to warrant new van connections or taxi service that could be provided under contract by private operators for a fraction of the cost of regular Metrobus service. Indeed, NVTC is setting up a van shuttle demonstration in the Tysons Corner area that will connect the West Falls Church and Dunn Loring Metrorail stations with nearby work sites, and which would be ideal for such a reverse commute application. However, in certain circumstances, otherwise empty Metrobuses may be available to provide such shuttle service to work sites at very little incremental cost.

To identify such situations, NVTC has organized meetings with staff of the District of Columbia and investigated Metrobus routes that are candidates for restructuring to permit revenue service in the counter-flow direction during peak hours.

Operations

```
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X                               X
X      NORTHERN VIRGINIA TRANSIT X
X      OPERATORS' COUNCIL       X
X  NVTC convenes quarterly meetings of X
X  operating managers from the Metro X
X  and local bus systems to discuss X
X  joint solutions to problems and to X
X  share operating experiences. X
X                               X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

It is self-evident that coordinated bus operations should improve productivity and provide better service for riders. NVTC's ridership reports and performance measures—described beginning on page 18—are designed to permit careful adjustments to be made of bus routes by planners. These data also facilitate cooperation among jurisdictions. To ensure that close cooperation is maintained among the persons charged with operating bus service in Northern Virginia (in addition to planners), NVTC has convened the Transit Operators' Council.

NVTC Productivity Inventory

```
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X
X      NVTC PRODUCTIVITY INVENTORY      X
X
X      Concrete actions that have yielded X
X      measurable improvements in pro-   X
X      ductivity at transit properties   X
X      are recorded by NVTC in a computer- X
X      ized datafile.  The file can be   X
X      sorted by property, type of im-   X
X      provement, or year.               X
X                                         X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

The Commission's new productivity file contains almost 50 entries. Actions taken by transit properties from around the country to boost total factor productivity (labor, capital, land) are recorded in a spreadsheet format. Categories included in the inventory are:

- o Administrative savings;
- o Crime deterrence;
- o Employee incentives;
- o Energy savers;
- o Management information;
- o New techniques;
- o Operation benefits;
- o Rebuilding/refurbishing buses
- o Safety features.

Sources include the studies and reports contained in the NVTC's Research Abstracts File, as well as transit periodicals and professional contacts. While not every technique that is successful elsewhere can be applied in Northern Virginia, the Productivity Inventory gives a ready source of ideas for improvement in the performance of the region's transit properties.

Figure 9
SAMPLE NVRTC RIDERSHIP REPORT SUMMARY



ROUTE 20: EASTBOUND

WASHINGTON BLVD LINE
RIDE DATES: March-April 1984

ORIGIN:	TRIPSON CORNER	ROUTE SEGMENT BOUNDARIES	TRIPSON CORNER
SHOPPING CENTER	A = on 123: International Dr to St. Andrews St	F = on Lee Hwy: Gallows Rd to West St	K = on Washington Blvd: Sycamore St to McKinley Rd
	B = on 123: St. Andrews St to Court House Rd & Maple Ave	G = on Lee Hwy & West St to Washington St & Greenway Blvd	L = on Washington Blvd: McKinley Rd to Glebe Rd
	C = Court House Rd & Maple Ave (RL 123) to Cedar La & DeSales St	H = on Washington St: Greenway Blvd to Park Ave	M = Washington Blvd & Glebe Rd to Ballston Metrotrain Station
	D = Cedar La & DeSales St to Gallows Rd & Belle Forest Dr	I = Washington St & Park Ave to Washington Blvd & Sycamore St	
	E = on Gallows Rd: Belle Forest Dr to Lee Hwy	J = Washington Blvd & Sycamore St	

AVERAGE PAXON

TRIPSON CORNER	Fairfax Co.	Falls Ch.	Mt. Vernon	Ballston											
ORIGIN	A	B	C	D	E	F	G	H	I	J	K	L	M	dest.	
Segment Mileage	0.0	1.8	1.3	2.5	1.2	0.6	1.5	0.9	0.7	0.9	0.0	0.8	1.4	0.5	0.1
Cumulative Mileage	0.0	1.8	3.1	5.6	6.8	7.4	8.9	9.8	10.5	11.4	11.4	12.2	13.6	14.1	14.2

1st Bus to 9:30 AM

AM Peak	A	B	C	D	E	F	G	H	I	J	K	L	M	dest.
On	4	0	1	3	2	1	5	4	2	3	3	2	6	0
Off	0	0	1	1	0	0	1	0	1	1	0	0	0	30
LV	4	4	4	6	8	9	14	17	18	20	23	25	30	30
Far-Mile	0	7	5	11	8	5	14	13	12	16	0	18	35	15
Midday	6	0	2	4	1	0	6	1	2	1	1	1	4	0
Off	0	0	1	1	1	0	2	1	2	0	0	0	1	17
LV	6	5	6	9	9	9	13	12	12	12	13	14	18	37
Far-Mile	0	10	7	15	10	5	13	11	8	11	0	11	19	9

PH Peak

On	20	2	1	2	2	1	4	1	2	4	0	1	5	0
Off	0	1	3	3	4	1	5	1	4	1	1	0	2	18
LV	20	21	19	18	16	16	15	15	13	16	15	16	19	18
Far-Mile	0	36	28	46	21	9	24	13	10	11	0	12	22	10

6:30-9 PM

On	6	1	1	1	0	0	3	0	0	2	0	1	2	0
Off	0	0	0	1	1	0	2	0	0	1	1	0	1	9
LV	6	6	7	7	6	6	7	7	7	8	7	8	9	9
Far-Mile	0	10	8	16	8	3	8	6	5	6	0	6	11	4

9-Midnite

On	13	0	2	5	0	0	4	0	0	1	0	0	1	0
Off	0	0	2	3	4	0	5	1	1	2	0	0	1	8
LV	13	13	13	15	12	12	11	10	9	8	8	8	8	8
Far-Mile	0	23	16	31	16	7	17	9	7	8	0	6	11	4

24 Hr TOTAL

On	10	0	1	3	1	1	5	1	2	2	1	1	4	0
Off	0	0	1	2	2	0	3	1	2	1	0	0	1	18
LV	10	10	10	11	10	10	12	13	12	13	14	15	18	18
Far-Mile	0	17	13	24	13	6	16	11	9	11	0	11	21	9

Total Trips	Far-Mile	Rev	Avg	Rev	Far-Mile	Rev	Far-Mile	Rev
Trips	Per Trip	Per Trip	Per Trip	Per Trip	Per Trip	Per Trip	Per Trip	Per Trip
3	109	40	36.3	14.2	0.93	2.6	39.1	161.7
6	165	31	27.5	14.2	0.82	1.9	33.5	131.1
4	178	31	44.5	14.2	0.91	3.1	40.9	245.2
2	28	10	14.0	14.2	0.72	1.0	19.4	92.7
2	48	21	24.0	14.2	0.72	1.7	33.3	158.8
17	528	40	31.1	14.2	0.82	2.2	37.9	162.1

AM Peak	Midday	PH Peak	6:30-9 PM	9-Midnite	24 Hr TOTAL
3	6	6	0	2	17
109	165	178	28	48	528
40	31	31	10	21	40
36.3	27.5	44.5	14.0	24.0	31.1
14.2	14.2	14.2	14.2	14.2	14.2
0.93	0.82	0.91	0.72	0.72	0.82
2.6	1.9	3.1	1.0	1.7	2.2
39.1	40.9	19.4	33.3	37.9	162.1
161.7	245.2	92.7	158.8	162.1	111.4
11.4	173.9	9.2	159.9	17.3	269.4
9.2	17.3	6.5	128.8	11.2	220.5
11.4	11.4	11.4	11.4	11.4	11.4

NOTE: Figures may not add due-to rounding.

NVTC Ridership Reports

```
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X                               X
X          NVTC RIDERSHIP REPORTS          X
X                               X
X  Ridership data are entered into        X
X  computerized spreadsheet models        X
X  that offer trip-specific details       X
X  and the ability to measure route       X
X  performance.                          X
X                               X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

The single most important determinant of bus service policy is ridership and the Ridership Reporting System described in this section is designed to provide better information for bus service decisions. This information is routinely gathered by WMATA for purposes of inspecting passenger demand and schedule adherence. The ridership figures are recorded and stored on hand-written forms known as "Ridechecks" and constitute the basis for the passenger data in the Ridership Reports.

NVTC has automated Metro's ridechecks, and the automated ridership files permit a variety of special reports and graphics to be easily generated by an IBM computer. The special reports are designed to support more detailed analysis of bus route proposals and are available upon request. Figure 9 shows a summary of the performance of Metrobus Route 2C:Eastbound, as an example.

The Ridership Report Data File will also permit performance evaluation of bus routes in order to promote more efficient bus services. The Fairfax County Office of Transportation uses an evaluation process known as the Bus Route Performance Measurement Program to rank bus route performance according to pre-determined criteria. NVTC programmed this evaluation process for IBM compatible microcomputers and is currently

working with Fairfax County staff to change their evaluation process from time-consuming manual procedures to an automated technique that uses NVTC Ridership Reports.

```
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X
X      NVTC'S AUTOMATED PERFORMANCE           X
X      EVALUATION AND SENSITIVITY            X
X      TESTING SYSTEM FOR FAIRFAX COUNTY     X
X
X      NVTC has integrated its Ridership     X
X      Reports with Fairfax County's per-   X
X      formance evaluation system to permit X
X      quicker computation of the County's  X
X      measures. In addition, the           X
X      sensitivity of the County's process  X
X      to particular assumptions can be     X
X      calculated.                          X
X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

NVTC staff have devised a fully automated process for computing the Fairfax County performance measures, relying on the Commission's computerized ridership reports for the principal input of data, and providing a self-prompting format to permit quick and routine analysis of routes. While Fairfax County staff can continue their existing practice of focussing on the portions of routes operating within the County, the new computer program is ideally suited to the routine preparation of reports summarizing performance along the entire length of a route or any of its segments.

NVTC Functional Route Classification and Performance Evaluation

```
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X
X      NVTC TRANSIT PERFORMANCE MONITORING      X
X
X NVTC is developing a procedure that will      X
X compile and publicize measures of perfor-     X
X mance for overall systems and individual      X
X transit routes, to provide a time-series      X
X record of progress and to facilitate com-     X
X parisons with systems elsewhere in the       X
X Country and other routes in the region.      X
X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

NVTC is now devising a performance evaluation system for routes as well as transit systems throughout Northern Virginia. The base of the evaluation system is NVTC's ridership reports. To accomplish the performance evaluation, first routes must be classified, so that those of a similar nature are compared. The process considers whether the route in question is core bound, express or local, operating on a weekday or weekend, whether it is peak or non-peak service, and whether it operates in the primary flow direction. After routes are classified they can be compared in terms of how well they are fulfilling their basic market purpose. Using indicators of performance, their relative performance can then be calculated.

There are several actions that can be initiated on routes that are not performing in an effective or efficient manner. A widely used approach is to reduce the level-of-service on a route to improve its productivity.

This approach produces short-run benefits by reducing subsidy requirements but may result in long-term patronage declines. Alternatively, efforts can be made to improve ridership through route-specific advertising or strategic re-orientation of the route to improve its competitive position within its market segment. For example, express bus routes with poor ridership and slow speeds are candidates for a re-examination of their potential market and the best approach for capturing that market (e.g., re-routing, limited stop service).

Connections Campaign

```

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X                               X
X      NVTC TRANSIT CONNECTIONS  X
X              CAMPAIGN          X
X                               X
X  As transit systems burgeon and more X
X  transfers are required, a greater X
X  effort is needed to inform the public X
X  about how to move between systems and X
X  to mitigate the adverse fare conse- X
X  quences. NVTC's Connections campaign X
X  would address these marketing problems X
X  in a coordinated effort to produce X
X  user-friendly transit systems. X
X                               X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

```

Creating a user friendly transit system demands intimate knowledge of travelers' desires and careful construction of service to facilitate these wishes in an efficient manner. And once service is in place, skillful promotion is essential. Especially where transfers are involved, passengers may view the transit experience as confusing and threatening. To overcome these concerns, several steps are necessary:

- o Friendly drivers who will respond meaningfully to passenger inquiries;

- o Telephone information personnel who will provide quick and accurate route and fare details;
- o Widespread distribution of brochures, route maps, and schedules;
- o Clear and noticeable signs at stations and transfer points;
- o Fare media that are easy to purchase and accepted by all service providers in the region; and
- o A fare structure that provides an affordable trip, even if transfers between systems are required.

Given the diversity of transportation providers in Northern Virginia, and the growth of activity centers not associated with radial routes toward the District of Columbia, the need for passengers to use more than one provider to complete a transit trip is expanding. To meet the challenge of such diverse travel origins and destinations with an increasing number of transportation providers (both public and private), NVTC has devised a "Connections" campaign. Federal funding is being sought to permit a reduced-price transfer program, but less costly aspects of the program are being pursued pending a decision on the grant request.

The Connections campaign features improved information, identified transit interchange locations, and reduced-price transfers. The demonstration would apply a revised fare structure for bus-rail passengers, utilizing passes and promotions, that will mitigate the current disparities between bus-only and bus-rail trips (which especially affect persons traveling to the District of Columbia from distant suburbs as new rail stations are opened). The fares and marketing would be integrated to encourage joint use of WMATA and locally sponsored services utilizing appropriate transfers and passes. The grant funds would reimburse local jurisdictions for lost revenues associated with

reduced-price transfers, and pay for aggressive marketing of the new fares and Connections locations.

The NVTC Connections demonstration would also address the growing needs of Northern Virginia residents for cross-region circulation service. That is, non-radial routes may be needed that connect such activity centers as Landmark, Seven Corners, Tysons Corner, and others. Some of these routes might be served with small buses or vans, perhaps utilizing some private-sector funding. These locations, as well as Metrorail stations, would serve as Connections points; passengers would be informed of new simple and inexpensive transfer procedures to move between these points.

Identifying New Public Transportation Markets by Market Research

```

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X                               X
X           NVTC MARKET RESEARCH           X
X                               X
X NVTC will initiate in October 1985      X
X a program of telephone surveys to       X
X identify potential new markets for      X
X transit service in such areas as        X
X Falls Church. The results will be      X
X used to accomplish Metrobus service    X
X adjustments or to initiate less        X
X traditional forms of transit service   X
X (e.g. van shuttles).                   X
X                                         X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

```

Most bus service adjustments in Northern Virginia are incremental. The basic system which is in place is modified only slightly to provide better service or reduce costs. Even when major changes are proposed (as is true of the pending Orange Line opening to Vienna), the emphasis is on retaining as much of the existing route structure as is practical. Given finite resources to devote to transit, such an approach is inevitable,

since constituencies seek to protect existing service, and policymakers are reluctant to launch untested service in new areas.

To overcome these strong disincentives to serve new areas, NVTC has taken a number of steps. These include a census data mapping effort (described above on page 12) which examined travel patterns compared to an overlay of the transit network to identify unserved markets. Characteristics of high transit mode shares were noted, in order to search for neighborhoods with similar characteristics that are not well served by transit.

Another ongoing NVTC activity is sponsorship of innovative transit demonstrations. Here NVTC designs transit demonstrations and obtains grant funds to implement the concepts. Among NVTC's projects were a \$6 million demonstration of express buses on the Shirley Highway, and more modest projects involving marketing of airport ground transportation, park-and ride express bus service from a parking lot at an unopened Metrorail station, late-night taxi shuttle service at Metrorail stations, route-deviation taxi service, and van shuttle operations between Tysons Corner and future Metrorail stations. The purpose of many of these experiments is to illustrate how innovative service can be provided to new markets--often in cooperation with the private sector--for less cost than more traditional methods.

Since the 1980 census data are dated, and some potential markets may not be intuitively obvious without careful market research, NVTC has obtained a Federal grant to conduct a program of market research featuring telephone surveys. Among the locations to be surveyed is Falls Church, with a view toward determining whether the potential exists for van shuttle operations to the two nearby Metrorail stations (East and West

Falls Church) due to open in mid-1986. NVTC will identify other sites in cooperation with local jurisdictions in which to apply its telephone market surveys. The result should be a further refinement of the Commission's regional transit database and some sound ideas for transit service to be provided to markets not now served.

Surveying will commence in October, 1985.

NVTC Marketing Plan

```

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X                               X
X      NVTC's MARKETING PLAN   X
X                               X
X  As a means to tie together the X
X  diverse transit marketing activities X
X  of NVTC with its jurisdictions, a X
X  marketing plan is being prepared for X
X  approval by NVTC. It will consist of X
X  specific work plans and budgets for X
X  one,-two-,and five-year marketing X
X  programs. X
X                               X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

```

Marketing has been identified as an essential element of NVTC's Bus Service Coordination Plan. Pinpointing travelers' needs and targeting promotional campaigns are vital to the success of transit in Northern Virginia. NVTC's involvement with marketing transit encompasses a wide range of activities:

- o The Alexandria Subway Shuttle Taxi and the Arlington Feeder Taxi each have separate marketing plans in which taxi companies, local jurisdictions, and NVTC cooperate in media campaigns and promotional efforts.
- o NVTC originated the concept of a weekend pass for the Metro system. Under the plan, a family of up to four persons would

ride all day on a weekend on both Metrorail and Metrobus for only \$5.00. It has taken several years in order to convince the Metro Board and staff that the proposal can and should be implemented. At present, Metro staff is carrying out a Board mandate to begin the program, and NVTC will assist by promoting participation among Northern Virginia hotels and tourist attractions.

- o NVTC is anxious to work with employers to encourage purchases of bus and rail passes for employees as a means to reduce employers' parking costs, reduce highway congestion, and support transit.
- o The Commission's marketing inventory provides a data base of possible remedial measures for poorly performing routes. The Commission could seek to apply appropriate remedial measures to the route in order to boost ridership, prior to a decision to cut back or eliminate service on such a route.
- o NVTC is seeking to initiate a prepayment program for commuter passes in the form of interest-bearing escrow accounts at financial institutions as a means to promote its commuter rail project.
- o NVTC Commissioners have requested data on the relative costs of the automobile versus public transit, for the purpose of publicizing the conditions under which transit offers a superior economic commuting choice.

Given diverse marketing projects such as these, at any given time NVTC will have numerous contacts with the media on a variety of subjects and, increasingly, with employers. To bring more order to these efforts, NVTC has prepared an annual Handbook, which sets forth the Commission's general goals and summarizes all its programs, with emphasis on how they fit

together to form a comprehensive whole. And, each year NVTC adopts a work program as part of its annual administrative budget. However, an explicit marketing plan, when adopted, would establish specific marketing objectives and propose milestones by which these efforts could be measured. The Plan would be updated regularly, with a short, intermediate, and long-term horizon (one, two, and five years, respectively).

NVTC staff is preparing a draft of such a plan for consideration by the Commission by the end of 1985.

Computerized Spreadsheet Model of Auto Versus Transit Costs

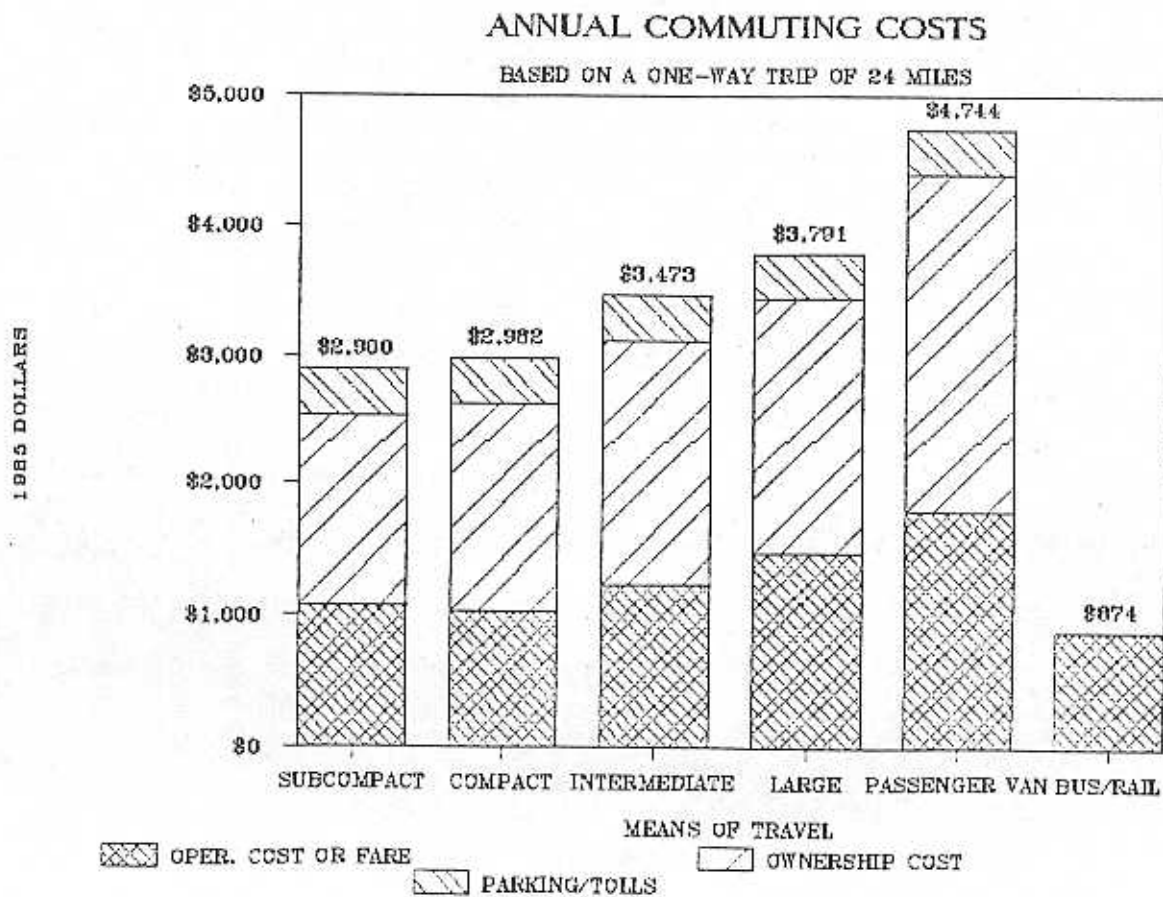
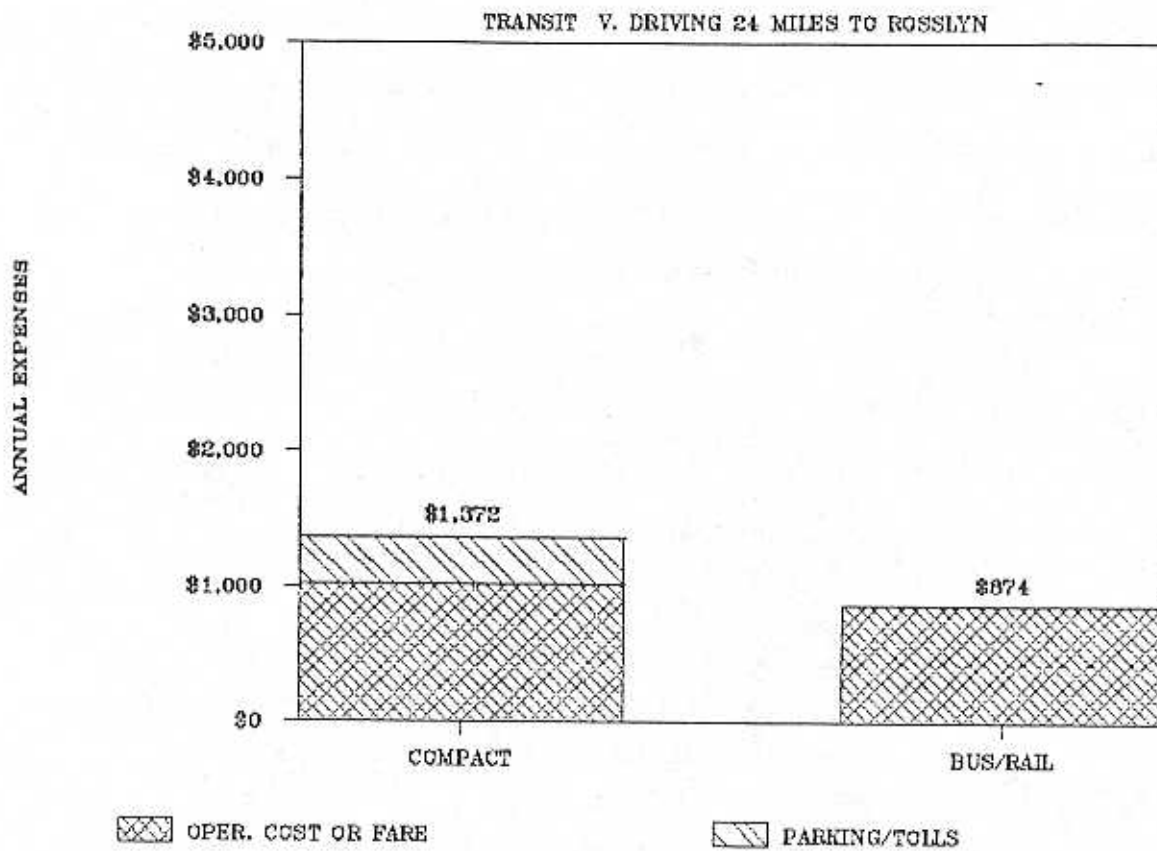
```

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X                               X
X      NVTC'S MODEL OF NET AUTO  X
X      VERSUS TRANSIT COSTS      X
X                               X
X      Using local and national data, X
X      NVTC has devised a model that X
X      compares net auto and transit X
X      costs for specific trips within X
X      the region, and also allows X
X      assumptions to be made about X
X      changes in components of these X
X      costs. X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

```

NVTC has computerized a U.S. Department of Transportation procedure for reporting the annual costs of owning and operating passenger vehicles of various sizes. The US DOT procedure considers taxes, fees, fuel and oil costs, insurance, depreciation, repair and maintenance, and new car prices plus accessories. NVTC has updated these costs and obtained data specific to this region (that is, personal property tax rates for each NVTC jurisdiction are included). The spreadsheet models also will

Figure 10
 AUTO/TRANSIT COST COMPARISONS



indicate auto costs for trips of any distance for drivers in each of the five NVTC member jurisdictions. Large, intermediate, small, and compact autos are reported separately, as are vans. Parking costs are also included.

Against these perceived automobile costs, comparable public transit costs are given in the models as viewed by passengers. These public transit costs include bus or rail only or a combined bus-rail trip. Both WMATA and local bus services are included. The number of passengers can also be varied to permit an analysis of carpool costs. The models will generate graphics to provide an immediate visual display of the relative costs.

These spreadsheet models provide the capability to respond to queries from citizens who desire to have a quick and accurate comparison of relative commuting costs by mode for various Northern Virginia locations. They also will provide information for use by NVTC in promoting the use of public transit as part of its marketing plan.

As can be seen by the example in Figure 10, operating costs of automobiles of various sizes, when compared to transit fares paid by riders, are often very similar. Many auto drivers consider fuel as the only relevant cost of driving to work, and the operating cost category in the figure comes closest to this perception. However, when depreciation paid by auto users and especially parking costs are included, transit generally provides a better bargain for an individual making a choice of mode.

Figure 11

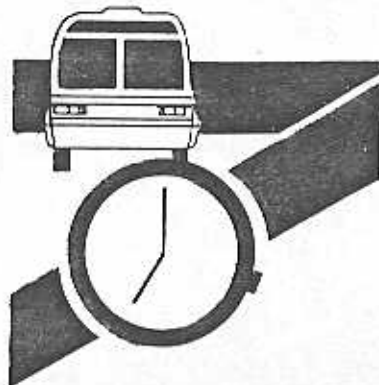
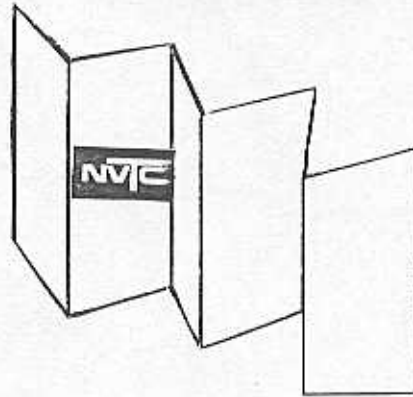
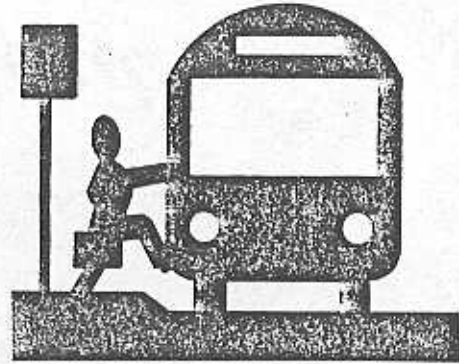
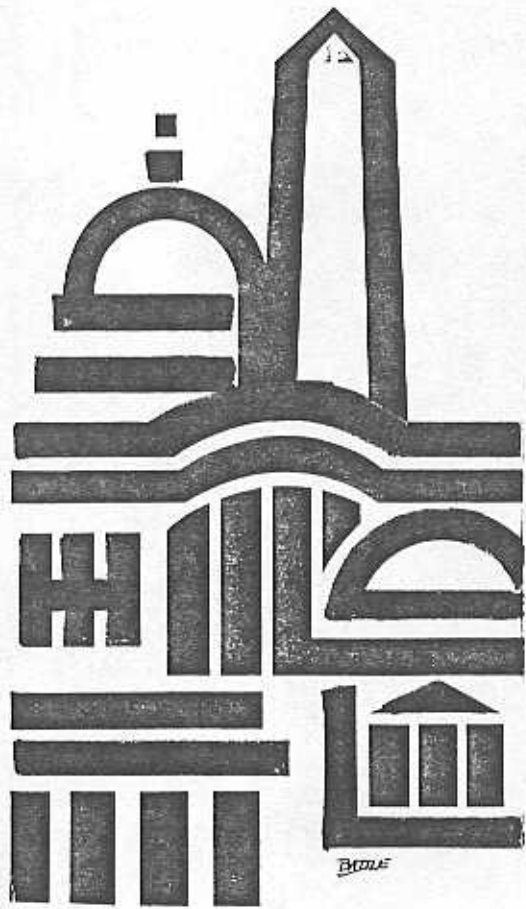
BUS SERVICE COORDINATION PLAN ACTION AGENDA

- Review first annual Bus Service Coordination
Plan report- - - - -September/October 1985
- Conduct public meetings regarding Vienna
service adjustments- - - - -September/October 1985
- Initiate telephone market research for
Falls Church and implement taxi-feeder service
in Arlington - - - - -October 1985
- Review Metro's Regional/Local Bus Study and
Federal City Council Study of Metro Financing- - - - - December 1985
- Approve NVTC Marketing Plan- - - - - December 1985
- Work with Northern Virginia's General Assembly delegation
to protect Metro financing and to gain new
commuter rail funding- - - - -January 1986
- Conduct formal hearings on Vienna service adjustments- - - - -January 1986
- Opening ceremonies for Metrorail's Orange Line
Opening to Vienna- - - - - June 1986
- Van feeder service initiated at Tysons Corner- - - - - July 1986
- Second annual report on the Bus Service Coordination Plan- -September 1986
- Complete implementation of Connections marketing campaign- - December 1986

Action Agenda for the Bus Service Coordination Plan

To continue the progress made during the first year of the Plan, activities programmed for the future are set forth in Figure 11. As can be seen, the bulk of the activities during the next year will still be focussed on the extensive Metrobus service adjustments to serve the Vienna Orange Line extension in mid-1986. However, the emphasis will clearly shift from technical activities (designating databases, compiling information, setting schedules) to more involvement of the Commissioners in implementation and policy-setting.

APPENDICES



A set of six appendices concludes the first annual report:

- I Transportation Agencies in the Washington Metropolitan Area
- II Principal Locations for Transit Information in Northern Virginia
- III Census Data Mapping
- IV Ridership Reports
- V NVTC Functional Classification and Performance Evaluation
- VI NVTC Auto Versus Transit Cost Model

