Northern Virginia
Transportation Commission

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RECOMMENDATIONS FOR PUBLIC TRANSIT SERVICE FOR THE NATIONAL AIR AND SPACE MUSEUM EXTENSION AT DULLES AIRPORT

-- October 4, 1990 --

PURPOSE AND APPROACH

The Northern Virginia Transportation Commission (NVTC) organized a multi-agency task force to develop a plan to provide public transit access to the Smithsonian Institution's proposed National Air and Space Museum Extension (Museum Extension). The Museum Extension is scheduled to open at Washington Dulles International Airport in 1995. Governor Wilder promised a transit plan to the Smithsonian's Regents which would address access to the Museum Extension as well as connections between the new Museum and the Dulles Airport terminal.

On September 20, 1990, the Commonwealth Transportation Board acted to provide a source of funding for a new rail transit system in the median of the Dulles Access Road connecting Dulles Airport with the Metrorail system at West Falls Church. A plan for that new rail system will be adopted by July, 1991. One of its markets will be the Museum Extension. The following service plan addresses interim bus service to serve the Museum Extension. When a rail system is completed, the proposed bus service would, of course, be modified.

NVTC forwarded a preliminary report (July 13, 1990) to Virginia's Secretary of Transportation and the Virginia Department of Transportation (VDOT) containing an assessment of service and financing options. That report, titled "Preliminary Public Transit Service and Financing Options for the National Air and Space Museum Extension at Dulles Airport," examined five types of service options. These included:

1) New shuttle bus service linking the Museum Extension with the regional Metrorail system;
2) Direct bus service connecting the Museum Extension with the Smithsonian Mall in Washington, D.C.;
3) A combination of direct bus service from the Mall and shuttle bus service from the Metrorail system;
4) Expansion of existing Metrobus service to link the Museum Extension with the Metrorail System; and
5) Expansion of existing bus and van services provided by the Metropolitan Washington Airports Authority (MWAA) to link the Museum Extension with the Dulles Airport terminal, the Metrorail system, and--perhaps--the Smithsonian Mall.

In addition to reporting the anticipated costs and revenues of the above service options, the task force examined scores of financing alternatives. Among these financial alternatives, including those that could fund a major portion of the costs as well as others that would provide only a modest contribution, are: Federal and state grants; tax assessment districts; new sources of regional aid; private funding; excess toll revenues from the Dulles Toll Road; local subsidies; and cost-sharing by MWAA, the Washington Metropolitan Area Transit Authority (WMATA) and (for marketing) the Smithsonian Institution. These sources are in addition to significant passenger fare revenues that would be generated to varying extents by each of the options.

NVTC's July 13th report provides a discussion of the background of the Museum Extension project, which will be located on 185-acres about five miles south of the main terminal at Dulles Airport. The initial phase of the Museum Extension will be 673,000 square feet, with ultimate expansion to 1.5 million square feet.

The July 13th report also describes the market. If no public transit is provided, the Museum Extension is forecast to attract 15,400 visitors during the first phase on a typical Saturday in August, and 8,600 persons on a typical weekday. Absolute peak daily attendance may reach 17,700 for the first phase. Effective transit service conceivably could serve as few as five percent of the patrons or as many as 18 percent, depending on assumptions regarding transit service. The task force and NVTC believe that the low end of that range is more realistic (5 to 10 percent).

The remainder of this report describes the principles used by NVTC to choose from among the several service configurations that were studied and, using those principles, provides a specific recommendation for service and financing. Additional background information is included in the July 13th report, including a list of task force members. Copies are available on request from NVTC.

PRINCIPLES

In considering the service and finance options developed by the staff task force, NVTC identified several principles for effective and affordable transit service. These principles were applied by staff and the Commission in crafting the set of recommendations described below.

1) Avoid duplication of service: The region, with its state and Federal partners, has invested in an effective network of Metrorail, Metrobus and local bus systems. Because peak demands for travel to and from the Museum Extension occur mid-day during the week and on weekends, when existing commuter-oriented public transit systems have excess capacity, every effort should be made to utilize existing services and equipment. Also, because Metrorail is an effective collector of passengers throughout the market area, costly duplicate bus service that parallels Metrorail lines should be avoided.

2) Match transit service with target markets: NVTC believes that most Museum visitors will not split their day between Mall museums and the Museum Extension at Dulles. Consequently, they will be traveling from their homes and hotels throughout the region directly to the Museum Extension. Tourists may proceed directly to the Museum Extension or use free hotel shuttles to reach Dulles Airport and then seek a quick and inexpensive connection to the nearby Museum Extension. Transit service that focuses entirely on nonstop bus service from the Mall will not serve this part of the market.

3) Do Not Overestimate the Potential Transit Market: Because most Museum Extension visitors will travel during off-peak hours, roads will be relatively lightly traveled at those times and the private automobile will be an attractive option. Even $5 parking charges at the Museum Extension will not seem onerous for a family, compared to transit fares of $2 to $3 per person, each way. Consequently, over-optimistic assumptions about transit market shares should not lead to procurement of expensive new buses that might not be well utilized.

4) Leverage plans for other transit investments: Fairfax County is working toward filing an application for a $72 million Suburban Mobility Grant from the Urban Mass Transportation Administration to implement the County's policy for improved transportation in the Dulles Corridor. The policy calls for construction of new park-and-ride lots (some of which could eventually serve as rail station sites) to be served by express buses. Also, the Metropolitan Washington Airports Authority provides frequent service to and from Dulles Airport in coaches, vans and minibuses. Metrobus routes also serve areas close to the Museum Extension. NVTC believes every effort should be made to utilize these existing and planned transit services and facilities before costly new investments are undertaken to serve the Museum Extension.

5) Financial assistance is needed from the Commonwealth if substantial new investments are to be made: Financial aid from the Commonwealth is essential in building and maintaining an effective public transit network. Local governments in Northern Virginia have identified more than $10 billion in new transit and highway investments needed to hold the line on congestion. Less than $3 billion is readily identifiable to support these investments. In such a situation, with taxes paid by users flowing primarily to Federal and state governments, local governments are not able to undertake new financial responsibilities without the help of their state and Federal partners. The Commission has noted favorably Governor Wilder's intention--expressed in a letter to the Smithsonian's Secretary, Robert Mc. Adams--to seek additional funding from the General Assembly to support the Commonwealth's commitment to the Smithsonian.

SUMMARY OF ANALYSIS TECHNIQUES AND ASSUMPTIONS

Potential ridership estimates were provided by consultants to the National Air and Space Museum. Analysis indicated annual attendance for Phase I of 1,943,000 people if no transit were provided. The Task Force assumed that effective public transit service can capture five to ten percent of the market, so that annual transit roundtrip ridership would vary from about 100,000 to 200,000. Phase I design day attendance without transit would be 15,400, yielding transit roundtrip ridership at five and ten percent transit shares of 770 and 1,540 respectively. The absolute peak day would have 17,700 visitors, or from 885 to 1,770 roundtrip transit users. The average weekday would have 8,600 visitors, or 430 to 860 roundtrip transit riders.

The Smithsonian's consultants also estimated attendance patterns throughout the day, which the Task Force used to determine optimum transit schedules to accommodate peak loads.

Revenues for the various transit service alternatives were derived by assuming fares charged for similar Metrobus and Metrorail service would be applied.

Costs were estimated by Metro staff, MWAA staff, and representatives of the private sector. The figures reported below are those provided by Metro. WMATA's staff actually "built" schedules to provide an accurate estimate of the capital and operating costs and then allocated those costs to Virginia jurisdictions using its approved allocation formulas. The use of WMATA's costs is not meant to imply that WMATA would ultimately be chosen to operate the bus service to the Museum Extension. Instead, it is expected that the services could be offered for competitive bid at the appropriate time. The representative of the private sector working with the Task Force indicated that the proposed services would be good candidates for operation by the private sector at rates competitive with those typically charged by WMATA.

RECOMMENDED SERVICE PLAN

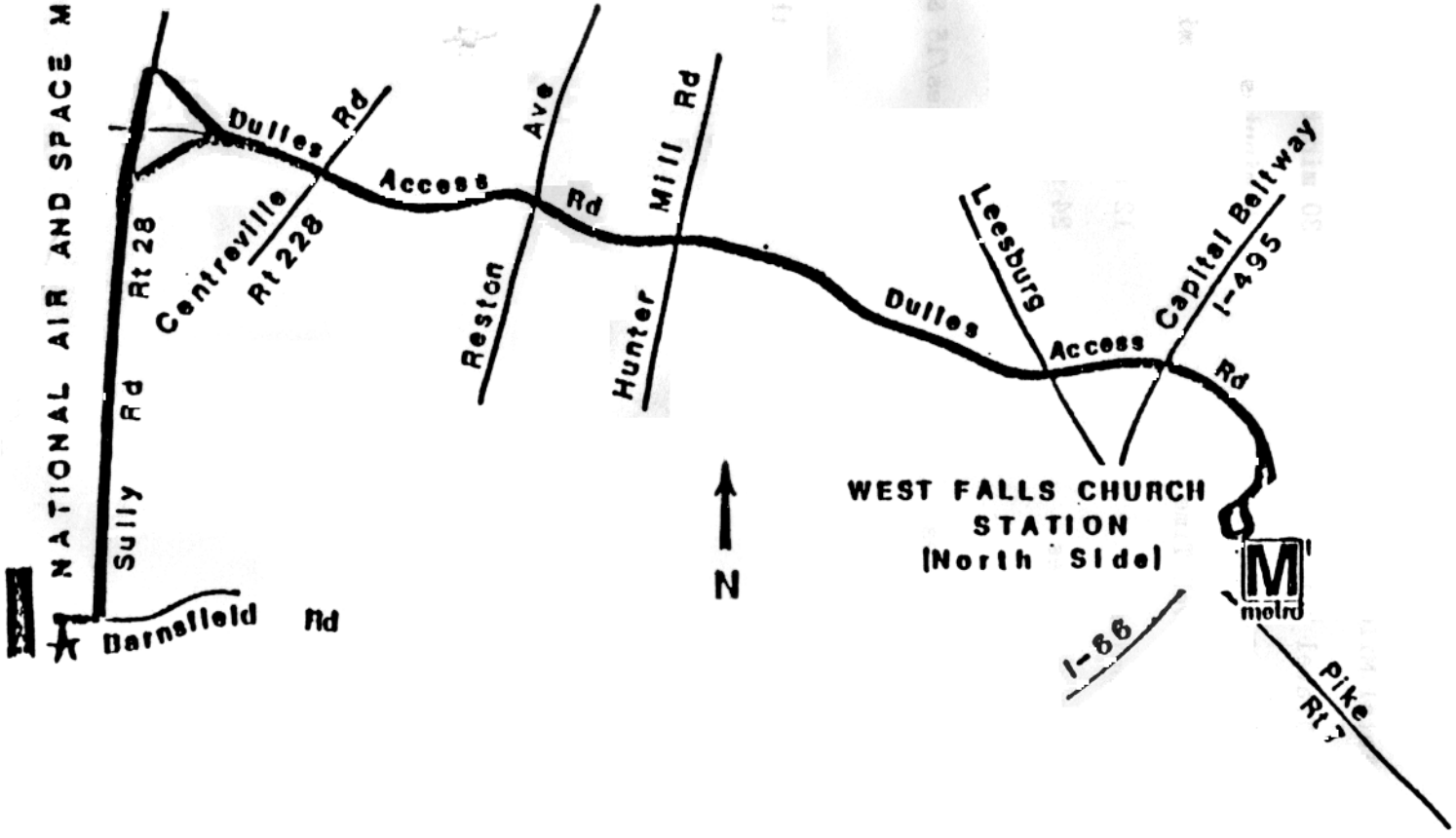
The Task Force recommends that a flexible service plan be implemented with two components that provide attractive public transit access to the Museum Extension from around the region at modest cost to riders and taxpayers. The two components (shuttle bus service to and from the West Falls Church Metrorail station and shuttle van service between the Dulles Airport Terminal and Museum Extension) are described in detail below.

1) Shuttle Bus Connections Between the Museum Extension and the West Falls Church Metrorail Station:

Figure 1 shows the routing for this shuttle service and Figures 2 and 3 list details about service characteristics and costs, revenues and subsidies.

FIGURE

Smithsonian National Air and Space Museum Line



Legend:

★ Terminal. Operates between West Falls Church Metro Station and the National Air and Space Museum.

FIGURE 2

WEST FALLS CHURCH EXTENSION SHUTTLE

SERVICE CHARACTERISTICS AND FARES

SERVICE CHARACTERISTICS	
One-Way Bus Miles	20 miles
Rail Miles from Mall	11 miles
Total Miles	31 miles
One-Way Bus Travel Time	30 minutes
Rail Travel Time from Mall	25 minutes
Total Travel Time	55 minutes
Bus Peak Frequencies	12 minutes/15 Sundays
Bus Off-Peak Frequencies	24 minutes/30 Sundays
Rail Peak Frequencies	6 minutes
Rail Off-Peak Frequencies	12 minutes/15 Sundays
FARES (ONE-WAY)	
Bus Peak	$1.15/$.80 with transfer
Bus Off-Peak	$.85/$.50
Rail Peak (from Mall)	$1.80
Rail Off-Peak (from Mall)	$1.25
Total Peak	$2.95/$2.60
Total Off-Peak	$2.10/$1.75

FIGURE 3

WEST FALLS CHURCH EXTENSION SHUTTLE

COSTS, REVENUES AND SUBSIDIES

10 PERCENT MODE SPLIT

Bus Annual Operating Cost	$1,292,000
Bus Annual Revenue	309,294
Annual Subsidy	982,706
Rail Annual Revenue (VA Share)	190,522
Net Operating Subsidy	792,984
Total Bus Capital Costs	1,050,000
Annual Capital Costs	5,775
Total Annual Subsidy	798,759

5 PERCENT MODE SPLIT

Bus Annual Operating Cost	$1,292,000
Bus Annual Revenue	154,647
Annual Bus Subsidy	1,137,353
Rail Annual Revenue (VA Share)	95,261
Net Operating Subsidy	1,042,092
Total Bus Capital Costs	1,050,000
Annual Capital Costs	5,775
Total Annual Subsidy	1,047,797

The proposed shuttle service would use five full-sized 47-passenger, lift-equipped transit buses (with one spare) to provide bus service at 12-minute frequencies during peak summer Museum hours (weekdays and Saturdays) and 15-minute service on Sundays. These frequencies would be set to match the Metrorail schedule (6 and 12-minute frequencies except on Sunday, when frequencies are 15-minutes). During the remainder of the year, buses would operate every 24 minutes (30 minutes on Sundays).

The Metrorail trip would take about 25 minutes from the Mall to travel 11 miles to West Falls Church at a rail fare of $1.25 off-peak. Connecting to the shuttle bus at West Falls Church, the rider would pay another 85-cents to ride the bus (or 50-cents with a Metrorail transfer) for 30 minutes to complete the remaining 20 miles to the Museum Extension. The typical fare would be no more than $2.10 for a 55-minute trip of 31 miles.

If Metrobus were to provide this service, operating costs would be $1,292,000 annually. Capital costs for the six buses would be $1,050,000 (but only $5,775 if it is assumed that 80 per cent of the cost would be paid from Federal grants and Virginia would share the remaining 20 percent equally with Maryland and the District of Columbia, while the costs are amortized over 12 years).

Considering revenues, if ten percent of the Museum's annual visitors used Metrorail and the shuttle bus at the assumed fares, the yield from bus passengers would be $309,294, while rail fares would generate $572,138 (of which Virginia would be credited with about one-third, or $190,522). To calculate these fare revenue estimates, the numbers of passengers expected to travel during peak and off-peak times by bus and rail were multiplied by the appropriate fares separately for eastbound and westbound trips (since westbound bus fares are less expensive with a Metrorail transfer).

Looking at bus-related subsidies, annual operating costs would exceed passenger fares by $982,706. Including Virginia's share of increased Metrorail revenue would reduce that subsidy to $792,984 annually.

If only five percent of Museum visitors used public transit, the total subsidy would be $1,042,092, assuming no reduction in the level of bus service provided.

In addition to considering estimates provided by WMATA, other potential transit operators were asked to develop cost and revenue figures to provide a range. Representatives of the private sector estimated bus operating costs of $1.1 million for this service, with capital costs of $1.4 million ($116,667 annually if amortized over 12 years). Staff of MWAA estimated annual bus operating costs of $2.2 million, with capital costs of $1.6 million ($134,166 annually amortized over 12 years).

As explained below, the assumed bus capacity for this component falls short of assumed ridership during peak hours on weekend days during non-summer months (when bus service is provided with only two buses operating at 30-minute frequencies). To accommodate this excess demand, direct bus service could be provided from the Smithsonian Mall. If it were, the ridership, revenue and subsidy totals in Figure 3 must be adjusted to account for the riders diverting to the direct service. It is assumed this amount is about 2,320 annual trips, thereby reducing Metrobus revenue by about $2,000 and Metrorail revenue by about $2,900 (of which a third would be Virginia's share). Consequently, subsidy would increase by about $3,000 annually to reflect this small adjustment.

2) Van Shuttles Between the Dulles Airport Terminal and Museum Extension:

Figures 4 and 5 provide estimates of the service characteristics and costs, revenues and subsidy for this service. Governor Wilder indicated to the Smithsonian's Regents that such connecting service would be part of the overall transit service plan.

A separate ridership study was not available for this alternative, so that the ridership and subsidy figures reflect only guesses. Since only one van is proposed to serve this market initially, if greater ridership materializes, it should be relatively easy to press one or more additional vehicles into service.

A 15-passenger van would operate every 30-minutes along the 5.5 mile route between the Dulles Airport Terminal and the Museum Extension. The fare would be $1.00. Travel time would be 11 minutes. Perhaps 90 passenger trips would be served on a typical weekend day, or 11,960 annually. Thus, annual revenue would be less than $12,000. Operating costs according to MWAA staff would be $216,000, plus the capital cost of the van ($20,000, or $6,667 amortized over three years). If a spare van is provided, capital costs would double.

Representatives of the private sector estimated operating costs for the van at $214,727 annually, with capital costs for two vans at $52,000 (including one spare).

Given the low anticipated ridership of this service component, the over $200,000 operating subsidy should be viewed as part of the overall system plan to provide access to the Museum Extension. When rail service opens to the Dulles Airport, this component of the Museum Extension's transit service would be greatly expanded.

In the meantime, it may be more efficient to offer subsidized taxi service to/from the Airport Terminal and the Museum Extension. Taxi drivers would be paid $1.00 by each rider. The drivers would be reimbursed by NVTC for any extra fare due. For example, if three

FIGURE 4

DULLES TERMINAL EXTENSION VAN SHUTTLE

SERVICE CHARACTERISTICS AND FARES

SERVICE CHARACTERISTICS	
One-Way Van Miles	5.5 miles
One-Way Van Travel Time	11 minutes
Van Peak Frequencies	30 minutes
Van Off-Peak Frequencies	30 minutes
FARES (ONE-WAY)	
Van Peak	$1.00
Van Off-Peak	$1.00

FIGURE 5

DULLES TERMINAL EXTENSION VAN SHUTTLE

COSTS, REVENUES AND SUBSIDIES

Van Annual Operating Cost	$216,000
Van Annual Revenue	12,000
Annual Subsidy	204,000
Total Van Capital Costs	40,000
Annual Capital Costs	13,333
Total Annual Subsidy	217,333

passengers rode together, they would pay $3.00 in total. If the meter charge were $6.00, the driver would collect the remaining $3.00 from NVTC. NVTC has sponsored a similar program at Alexandria's Metrorail stations. While less costly than operating a dedicated van shuttle, there are administrative burdens. The willing participation of taxi drivers is essential to maintain customer goodwill. For example, drivers must be willing to queue at the Museum to wait for passengers for the return trip to Dulles Airport.

If only 12,000 passengers used the low-priced taxi service each year, net subsidy cost, including administration, should be less than half the cost of operating a dedicated van shuttle.

FINANCING

NVTC and its staff task force examined a wide array of financing options for the service plan described above. Details are provided in an appendix to the July 13th preliminary report. Given competing demands for available Federal and state aid, a sharply declining economy and budget shortfalls of the Federal and Commonwealth governments, the ability of local governments to fund the service plan is severely restricted.

Consequently, one source of funding appears to offer the greatest promise: a portion of excess toll revenues accruing to the Commonwealth from the Dulles Toll Road (currently about $12.5 million annually, and expected to grow to $25 million annually by 1995). State statutes permit the use of such revenues for public transit purposes in the Dulles Corridor. Virginia's Commonwealth Transportation Board has approved setting aside a specific portion of the toll revenues for transit purposes (e.g., 15 percent initially, increasing to 85 percent in subsequent years).

The two-component plan would appear to be an ideal candidate for funding from the excess Toll Road revenues as part of overall plans for improved bus and rail service in the Dulles Corridor.

OTHER ALTERNATIVES

While in the judgment of a majority of the Task Force the recommended service plan provides the best service at reasonable cost, several other alternatives were seriously considered and, under certain circumstances, could become practical. Among these alternatives are:

1) Shuttle Bus Connecting the Vienna Metrorail Station to the Museum Extension:

Figure 6 provides a map and Figures 7 and 8 summarize service characteristics and costs, revenue and subsidies.

A shuttle connecting the Vienna Metrorail station to the Museum Extension would require a shorter bus trip (only 13 miles versus 20 from West Falls Church) although bus travel time would be about the same as from West falls Church (30 minutes) given congested roadways. A longer Metrorail trip is required to reach Vienna, with the result that more rail revenue is generated. In combination, a shorter bus trip and longer Metrorail ride yield lower operating costs and higher rail revenues. As a result, subsidy costs are reduced, compared to the recommended alternative operating from West Falls Church. Assuming a five percent share of Museum Extension visitors use the new service (worst case), the annual Vienna shuttle operating subsidy cost would be $830,822, compared to $1,042,092 for the West Falls Church shuttle.

Another possibility that was explored was integrating the shuttle bus service into existing Metrobus Routes 20y and 20z, now serving the Vienna Metrorail station and terminating near the future site of the Museum.

Service to the Vienna station was not recommended by a majority of the Task Force, despite its lower subsidy cost, for two reasons:

a) The Task Force believes that the quality of service would be higher from West Falls Church, given less likelihood of traffic congestion delaying bus schedules; and

b) Excess toll revenues from the Dulles Toll Road presumably would not be available to defray the costs of service from Vienna, because such service would not operate in the Dulles Corridor. (Some Task Force members argued that since a fixed amount of revenues would be available for transit purposes from that source, and since eligible transit costs in the Dulles Corridor would far exceed available funds, in effect the subsidy costs of the new Smithsonian service would be borne by local governments, and as such should be kept to a minimum by choosing the Vienna option.)

FIGURE 7

VIENNA EXTENSION SHUTTLE

SERVICE CHARACTERISTICS AND FARES

SERVICE CHARACTERISTICS	
One-Way Bus Miles	13 miles
Rail Miles from Mall	16 miles
Total Miles	29 miles
One-Way Bus Travel Time	30 minutes
Rail Travel Time from Mall	32 minutes
Total Travel Time	62 minutes
Bus Peak Frequencies	12 minutes/15 Sundays
Bus Off-Peak Frequencies	24 minutes/30 Sundays
Rail Peak Frequencies	6 minutes
Rail Off-Peak Frequencies	12 minutes/15 Sundays
FARES (ONE-WAY)	
Bus Peak	$.85/$.50 with transfer
Bus Off-Peak	$.85/$.50
Rail Peak (from Mall)	$2.45
Rail Off-Peak (from Mall)	$1.25
Total Peak	$3.30/$2.95
Total Off-Peak	$2.10/$1.75

FIGURE 8

VIENNA EXTENSION SHUTTLE

COSTS, REVENUES AND SUBSIDIES

10 PERCENT MODE SPLIT	
Bus Annual Operating Cost	$1,076,000
Bus Annual Revenue	275,319
Annual Subsidy	800,681
Rail Annual Revenue (VA Share)	215,035
Net Operating Subsidy	585,646
Total Bus Capital Costs	1,050,000
Annual Capital Costs	5,775
Total Annual Subsidy	591,421
5 PERCENT MODE SPLIT	
Bus Annual Operating Cost	$1,076,000
Bus Annual Revenue	137,660
Annual Bus Subsidy	938,340
Rail Annual Revenue (VA Share)	107,518
Net Operating Subsidy	830,822
Total Bus Capital Costs	1,050,000
Annual Capital Costs	5,775
Total Annual Subsidy	836,597

2) Utilize MWAA's Washington Flyer Service to Link West Falls Church Metrorail with Dulles Airport and the Museum Extension:

Rather than operating a separate shuttle connecting the Dulles Airport Terminal with the Museum Extension on the one hand, while on the other hand providing bus service connecting West Falls Church Metrorail with the Museum Extension, MWAA could be asked to operate an integrated service. Due to cost and other considerations, this alternative was not recommended, but could be available for the future if conditions should warrant. Cost, ridership and financing data are available for this option on request to NVTC staff.

3) Use of Fairfax County's Proposed Express Bus Network to Link the West Falls Church Metro Station with the Museum Extension:

Fairfax County is working toward filing a grant application with the Urban Mass Transportation Administration by December 31, 1990, which would provide $36 million of the $72 million that is needed to develop an expanded express bus system in the Dulles Access Road corridor. Federal funds would be used for the construction of commuter parking facilities, some ramps and roadways, and transit centers. These facilities could later be converted for use as part of future rail stations. At this time, Fairfax County expects to provide the local matching share of the grant by funding acquisition of buses needed for the service. Public hearings on proposed alternative sites for park-and-ride lots and transit centers will be held during October 1990. Upon completion of the public hearings, the County Board will make final selection of sites for park-and-ride lots and transit centers. County staff will develop a detailed bus service plan for the Dulles Corridor based on Board approved locations for park-and-ride lots and transit centers. Possible integration of the West Falls Church Metro Station-Air and Space Museum Extension bus service may be considered as part of this bus service planning process.

4) Bus Shuttle From Loudoun County Park-and-Ride Lot Providing Supplemental Service to the Museum Extension and West Falls Church Metrorail:

If Loudoun County chooses to open a park-and-ride lot near Dulles Airport and contract for bus service connecting the lot with the West Falls Church Metrorail station, then the same buses can provide counterflow supplemental service to the Museum Extension on weekdays. During the morning peak period, no deviation to the Museum Extension would be made (since the museum wouldn't be open), but for hourly mid-day bus service, the bus could travel a triangular route in the morning and early afternoon from parking lot to Metrorail to Museum Extension to parking lot and in the mid afternoon through early evening reverse that route.

Few park-and-ride lot users or Museum visitors would be inconvenienced and the extra supplemental service might allow regular Museum Extension shuttle bus service frequencies to be reduced during the times that the Loudoun shuttle was operating, without a deterioration of service quality.

5) Limited Direct Bus Service Between the Smithsonian Mall and Museum Extension:

Regularly scheduled shuttle bus service from the West Falls Church Metrorail station may not be sufficient to accommodate demand on peak weekend days during the non-summer months. Accordingly, the opportunity exists to offer direct service from the Mall during these times at a premium fare on a break-even basis. Figure 9 shows the route.

Ridership on an average Sunday for such service might be only about 58. This is the amount by which assumed ridership exceeds shuttle bus capacity to and from West Falls Church when demand patterns are examined on a daily and hourly basis, rather than considering only annual totals. To serve this ridership would require two buses for the 50-minute direct bus trip operating at 60-minute frequencies from 1:00 p.m. to 5:00 p.m. on Sundays only during non-summer months. Assuming an hourly cost of $60 for 6 daily trips, revenue would exceed operating costs for a typical day only if one-way fares exceeded $6.00. If amortized capital costs of $20 hourly are added, fares would have to be over $8.25 to provide break-even service.

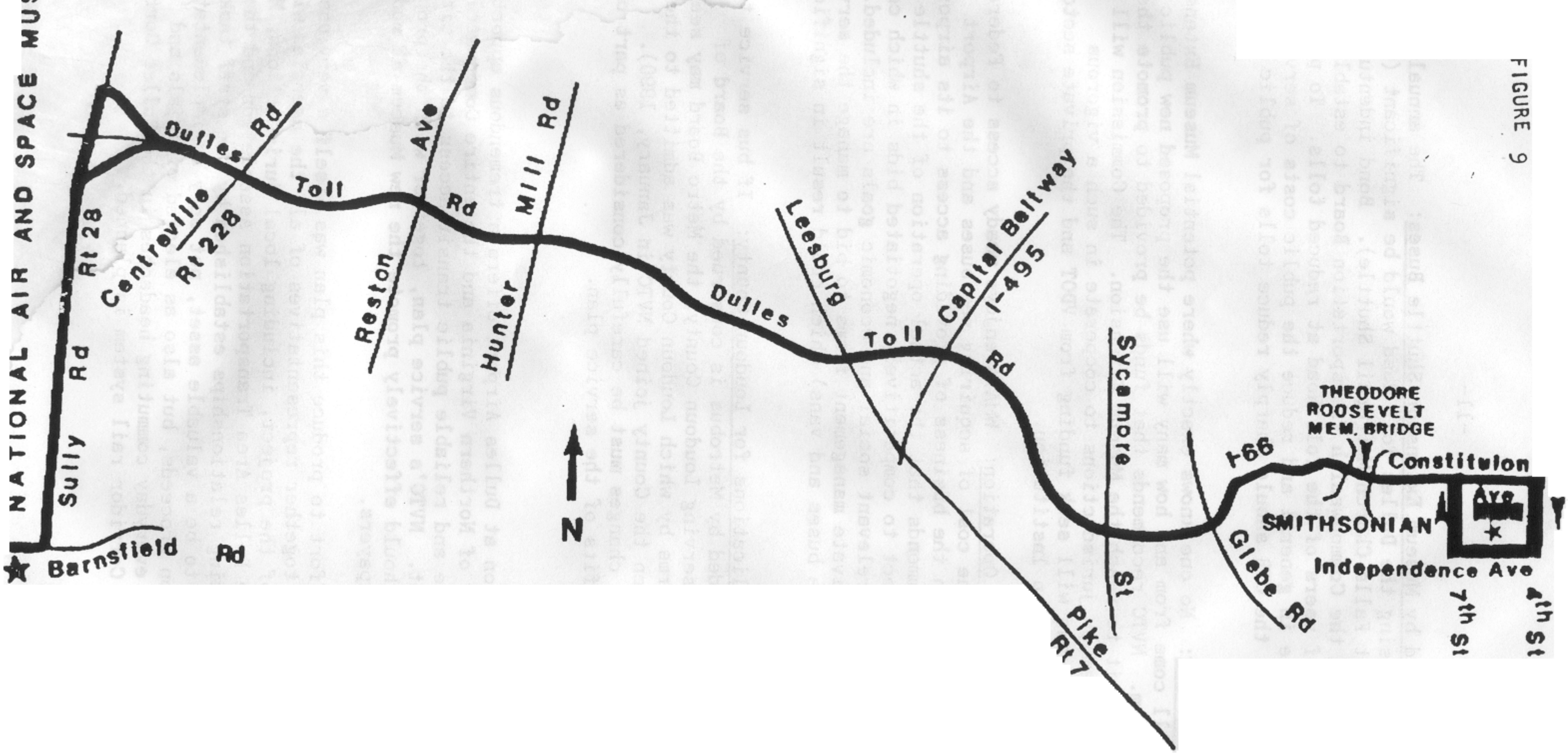
Such service is unlikely to be practical for a private sector operator under assumed conditions. However, if demand is underestimated or WMATA is unable to expand its service from West Falls Church, this private-sector system may become viable.

ADDITIONAL ISSUES

While the service plan described above should provide workable and flexible public transit access at affordable cost (while meeting NVTC's principles), several issues must also be resolved to derive the maximum benefits from the plan:

1) Access to the Museum Extension Site: While traffic congestion at the site itself shouldn't restrict access, concerns exist about future bus travel times on Highway 28 between the Dulles Toll Road and the Museum Extension. MWAA does plan to construct an on-airport service road that could provide faster access to Museum Extension-bound buses, but no funding for the service road has been identified so it is uncertain when it will be constructed. Such a road would permit buses to use the Dulles Access Road rather than the more congested Toll Road (currently access to Highway 28 from the Access Road requires a lengthy detour at Dulles Airport). A related access issue occurs at the intersection of Barnsfield Road with Highway 28. The Smithsonian's plan assumes construction of this interchange by 1995, but in this time of budget crises, that assumption must be carefully monitored.

Smithsonian National Air and Space Museum Line



Legend:

Operates between Independence Ave & 8th St. and the National Air and Space Museum terminal

2) Tolls Paid by Museum Extension Shuttle Buses: The annual cost of tolls for buses using the Dulles Toll Road would be significant (e.g. $50,000 for a West Falls Church Metrorail Shuttle). Bond indenture agreements permit the Commonwealth Transportation Board to establish special classes of users of the Toll Road at reduced tolls. To promote public transit use in general and reduce the public costs of serving the Museum Extension, the CTB should sharply reduce tolls for public transit vehicles.

3) Marketing: No one knows exactly where potential Museum Extension visitors will come from and how many will use the proposed new public transit system. NVTC recommends that funds be provided to promote the use of public transit to reach the Museum Extension. The Commission will encourage its member jurisdictions to cooperate in such a vigorous marketing effort and will seek funding from VDOT and the private sector as well as the Smithsonian Institution.

4) Private Sector Operation: WMATA enjoys ready access to Federal funds to help defray the cost of acquiring new buses and the Airport Authority already is in the business of providing access to its airport. Nonetheless, NVTC recommends that the actual operation of the shuttle bus service should be subject to competitively negotiated bids in which costs, reliability and other relevant social and economic goals are included. This will encourage private management firms to bid to manage the service (and perhaps supply the buses and vans) which could result in significant savings.

5) Financial Implications for Loudoun County: If bus service to the Museum Extension provided by Metrobus is construed by the Board of Directors of WMATA as serving Loudoun County, the Metro Board may seek to alter the financial terms by which Loudoun County was admitted to the Metro Transit Zone (when the County joined NVTC in January, 1990). Consequently, any such changes must be carefully considered as part of the overall costs and benefits of the service plan.

CONCLUSION

The Museum Extension at Dulles Airport offers a tremendous opportunity to benefit the economy of Northern Virginia and the entire Commonwealth. Convenient, inexpensive and reliable public transit access to the site is an essential ingredient. NVTC's service plan, together with the proposed financing mechanism, should effectively promote the new Museum at modest cost to riders and taxpayers.

The cooperative effort to produce this plan was itself a very useful exercise. It brought together representatives of all the agencies with a stake in the success of the project, including local jurisdictions, NVTC, VDOT, MWAA, WMATA, the Dulles Area Transportation Association and the Smithsonian. The working relationships established by the staff task force should continue to be a valuable asset, not only as implementation of the Museum Extension proceeds, but also as elected officials and citizens wrestle with everyday commuting headaches in the Dulles Corridor and as the new Dulles Corridor rail system is planned.

FIGURE 10

SUMMARY OF RECOMMENDED SERVICE PLAN

	WEST FALLS CHURCH/ EXTENSION BUS SHUTTLE	DULLES TERMINAL/ EXTENSION VAN SHUTTLE	TOTALS
Annual Ridership (5 percent mode split)	100,000	12,000	112,000
Off-Peak Fare (Bus and Rail)	$2.10	$1.00	
Travel Time	55 minutes	11 minutes	
Annual Bus Operating Cost	$1,292,000	$ 216,000	$1,508,000
Annual Bus Capital Cost	$ 5,775	$ 13,333	$ 19,108
Total Annual Bus Cost	$1,297,775	$ 229,333	$1,527,108
Annual Bus Fare Revenue (5 percent mode split)	$ 154,647	$ 12,000	$ 166,647
Annual Virginia Metrorail Fare Revenue (5 percent mode split)	$ 95,261		$ 95,261
Annual Bus Operating Subsidy	$1,137,353	$ 204,000	$1,341,353
Annual Bus Capital and Operating Subsidy	$1,143,128	$ 217,333	$1,360,461
Net Subsidy (Including Rail Revenue)	$1,047,797	$ 217,333	$1,265,130