



TRANSPORTATION PLAN

5.1 OVERVIEW AND RECOMMENDATIONS

A. CHAPTER ORGANIZATION

This chapter has eight main sections. This first section, the overview, presents the general conclusions on which the recommendations in this chapter are based, the objectives, recommendations, and overall strategies for improving transportation in North Bethesda. The second section explains how future traffic was estimated and the resulting numbers analyzed. The final sections explain the recommendations listed in the overview, by topic.

B. GENERAL CONCLUSIONS

For this Master Plan, future traffic was forecast. Those forecasts were analyzed to determine what transportation improvements will be necessary in the future. There are several basic findings from the transportation analysis that underlie the recommendations. They are summarized here and presented in greater detail and with quantification in subsequent sections.

Current roadway network conditions in North Bethesda are generally congested.

Indicators of this are that key intersections are at low levels of service and the area-wide average for all roadway links is outside the acceptable limits for the current Annual Growth Policy (AGP). These conditions are due to a generally restricted roadway system, moderate levels of transit and ridesharing use, and high levels of commercial and residential development in both the Planning Area and other portions of the region. (The existing highway system is shown on Figure 52.)

Restricting development in North Bethesda will not eliminate the need for transportation system improvements. In addition to approved but unbuilt development in North Bethesda, growth will occur in other portions of Montgomery County and throughout the region. Due to North Bethesda's strategic location, many vehicle trips will travel through the area to homes and jobs regardless of growth levels in North Bethesda. Adding jobs and dwelling units in North Bethesda provides opportunities for some of the otherwise through trips to be destined to North Bethesda and for some workers to live near their jobs. So new trips, whether due to local growth or through traffic, will add to current congestion and necessitate additional capacity.

Transit and demand management are desirable to provide additional capacity, but will need to be accompanied by additional roadway capacity. Increasing use of non-

auto-driver modes such as transit, ridesharing, walking or biking is important to obtain many of the Plan objectives. Retaining right-of-way for future transitways identified in the Transportation Network Studies provides for long-term needs. However, the remaining vehicle trips will create unacceptable levels of congestion and delay unless there are significant additions to the roadway network. This Plan recommends additional roadway capacity, together with transit and demand management with emphasis on pedestrian and bicycle use.

C. PLAN OBJECTIVES

- Provide a balanced transportation system for the recommended land use plan. This Plan defines balance between transportation and land use as a system where no roads or intersections are beyond their total capacity and the average area-wide level of service (a measure of traffic congestion) is within the bounds for the recommended transportation category (in this case, Group V as defined by the Annual Growth Policy).

It is important to note that the recommended transportation system is designed to be in balance with land use, including projected growth external to North Bethesda and the full build-out of every parcel according to the recommended land use. It is deemed prudent that the transportation system plan accommodate full build-out, although it is highly unlikely that this build-out will occur within the 20-year life of the Plan.

- Increase the non-auto-driver modes for commuting. The transportation analysis and recommendations strongly address actions to increase the peak hour commuter use of transit, ridesharing, bicycling, and walking. These modes are under-used now in North Bethesda, and they offer significant potential for improving a variety of situations created by the current overuse of the single-occupant automobile.
- Provide for better local circulation in the commercial areas. Even with increased use of non-auto modes, growth around the Metrorail stations and in Rock Spring Park will bring increased auto volumes. The roadway network needs to be expanded to provide motorists with circulation and access to existing, approved, and new development without having to use highways such as Rockville Pike or Old Georgetown Road.
- Provide guidance for standards in the regulatory process. This Master Plan envisions a changing, evolving North Bethesda. Revisions to the standards used in Local Area Transportation Review and perhaps the Annual Growth Policy should be developed to accompany the other recommendations.

D. SUMMARY OF TRANSPORTATION STRATEGIES

Table 10 presents a summary which identifies Master Plan strategies for improved transportation in North Bethesda. These strategies are among those discussed in more



detail in the chapter. This summary shows that there are four basic trip orientations that differentiate the strategies: people traveling through, to, from, and within North Bethesda. Particular strategies should be oriented to meeting the transportation needs and travel behavior of those different types of travelers.

The summary is also organized by the trip path of the travelers based upon the start of their trips, the predominant means of travel, and the end of their trips. Different strategies are identified that affect people's travel behavior in distinctly different ways. For example, strategies for controlling parking availability and rates are primarily related to the end of trips for persons who are coming to the area from outside or perhaps from within. Such parking-related strategies will have no effect on people traveling through the area or residents who travel from North Bethesda to other areas unless such programs are in place at their destination.

This overview summary is not meant to be a complete identification of all strategies. Rather, it should be viewed as a tool which can be used to compare and interrelate the very diverse transportation strategies discussed below.

E. PLAN RECOMMENDATIONS

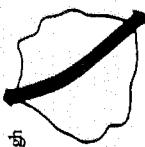
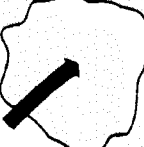
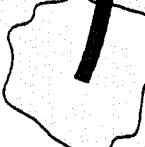

The following presents a brief description of the key transportation system and policy recommendations in the Master Plan. Each of these is described in more detail in subsequent sections, with supporting findings and other information. Many of the recommendations are also shown schematically on the accompanying Figures.

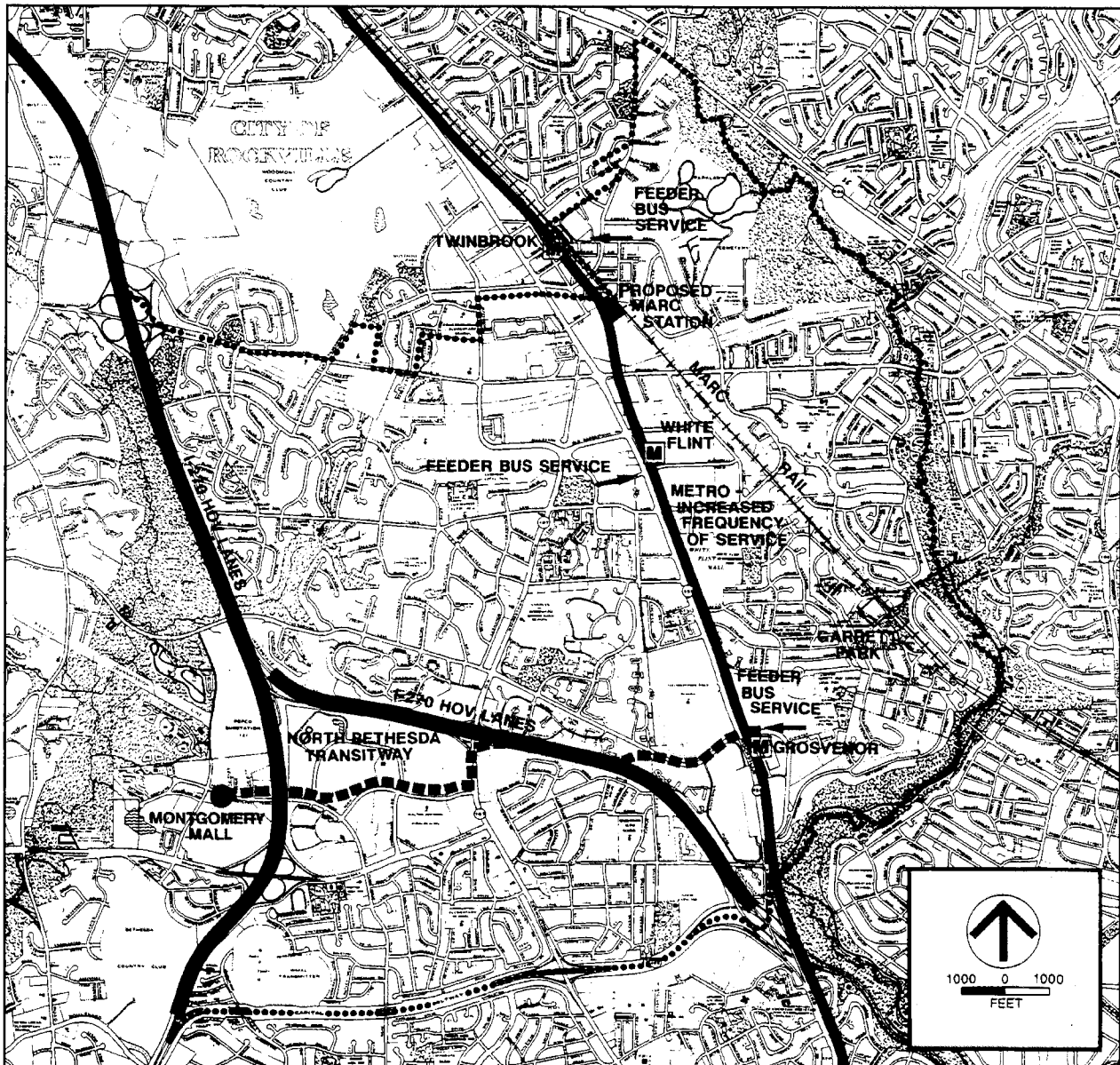
Public Transportation System

- Major expansions to the public transportation system in North Bethesda are needed to provide an alternative to driving and to encourage transit use. Additional service will be needed to meet expected demands on some sections of the Metrorail system because of already high peak-hour ridership levels. Preservation of future transitways is a long-term addition to services, discussed in a separate recommendation. The improvements are summarized on Figure 53.
- Future plans should include running every northbound train on the Red Line all the way to Shady Grove. Since approximately every other train now turns back at Grosvenor, this would have the effect of increasing the frequency of transit service and providing many more seats for North Bethesda passengers.
- Provide increased local bus services both as feeders to the Metrorail stations and to connect the stations with employment locations. Many routes in North Bethesda now operate at 30 minute headways, which are not frequent enough to attract ridership. This recommendation includes expansions and enhancements to the current bus services operating as shuttles from the White Flint station. The additional services can be successful if supported by Transportation Demand Management actions as discussed below.
- Provide a MARC station between Bou Avenue and the Montrose Parkway right-of-way. The precise location of the station will be determined by subsequent

TABLE 10

IDENTIFICATION OF MASTER PLAN STRATEGIES FOR IMPROVED TRANSPORTATION IN NORTH BETHESDA

Components of Travel Through, To, From, and Within North Bethesda Predominant Means of Travel for the Trip						
Trip Orientation	Start of the Trip	Auto/Highway	Transit	Biking	Walking	End of the Trip
Through 	<ul style="list-style-type: none"> Locate more housing closer to accessible transit that come through the area 	<ul style="list-style-type: none"> Emphasize I-270, and Md 355 for through trips I-270 spur expansion 	<ul style="list-style-type: none"> Increase Metrorail frequency past Grosvenor Fare policy changes County-wide demand management programs 			
To 	<ul style="list-style-type: none"> Locate more housing closer to transit routes that come into the area 	<ul style="list-style-type: none"> Montrose Parkway Intersection TMD improvements Rock Spring Park-I-270 Interchanges 	<ul style="list-style-type: none"> HOV lane on I-270 and HOV connection to Rock Spring Park Increase Metrorail frequency past Grosvenor Fare policy Establish TMD Transit connection from Grosvenor station to Montgomery Mall New MARC Station 	<ul style="list-style-type: none"> Implement bikeway plan 		<ul style="list-style-type: none"> Parking availability and rates TMD and programs for each employment center Bike storage for workers at employment centers
From 	<ul style="list-style-type: none"> Share-a-ride Program for area residents Improve pedestrian and bike access to bus routes and Metrorail stations 	<ul style="list-style-type: none"> Intersection improvements Montrose Parkway Rock Spring Park-I-270 Interchanges 	<ul style="list-style-type: none"> Increase Metrorail frequency past Grosvenor Improved bus services in area New MARC station Transit connection from Grosvenor station to Montgomery Mall 	<ul style="list-style-type: none"> Bike paths to employment centers and Transit Improved bike storage at Metro station Greenway system 		<ul style="list-style-type: none"> Transit and pedestrian circulation systems in Montgomery County and regional activity centers
Within 	<ul style="list-style-type: none"> Improve sidewalks, bike routes, access to bus routes, and shuttle buses 	<ul style="list-style-type: none"> Intersection improvements Provide new local circulation roads 	<ul style="list-style-type: none"> Transit connection between Grosvenor and Rock Spring Park/Montgomery Mall Shuttle buses between Metrorail areas and commercial/residential areas 	<ul style="list-style-type: none"> Improve bike paths to employment centers and community facilities Improve bike storage at employment centers Greenway system 	<ul style="list-style-type: none"> Improve pathway and sidewalk system between residential areas and employment centers and community facilities Greenway system 	<ul style="list-style-type: none"> Reduce conflicts with vehicles; pedestrian emphasis at intersections; improved street-scapes



engineering studies. Care should be taken so that redevelopment in the vicinity does not preclude the optimal siting of the station. The selected site should accommodate auto, bus, bicycle, and pedestrian access, and an appropriate amount of parking should also be provided.

- Provide a high capacity transit connection between the Grosvenor Metrorail station and Rock Spring Park, extending to Montgomery Mall and even further west to the neighboring multi-family residential areas. The transit use in Rock Spring Park is very low now, under 10% of peak-hour trips. The thousands of workers and future residents there could be attracted to Metrorail with a high quality connection, provided through a separate transitway. The recently completed North Bethesda Transitway Feasibility Study provides one good vision of how this could be provided and the right-of-way for a transitway is included in this Master Plan. The final alignment of this transit connection should be designed so that pedestrian access from Wildwood to the Davis Tract is not precluded.
- The Maryland Department of Transportation has announced its intent to add a High-Occupancy Vehicle (HOV) lane in each direction on both the I-270 East Spur and the I-270 West Spur, and to designate an existing lane in each direction on the I-270 mainline for HOV use as well. The subsequent staging amendment to this Plan will evaluate the impact of this decision on the planning area's level of service for transportation, and it will determine the amount of development that can be associated with implementation of this HOV system.

Transportation Demand Management

A variety of actions can be taken to support the use of non-auto driver modes. These will need to be implemented through the actions of both the public and private sector. This Plan describes the actions needed in general terms, to provide flexibility in future structuring of specific programs.

- Create one or more Transportation System Management Districts (TMD) around, at the least, the Metrorail stations and Rock Spring Park. These TMDs would have mandatory participation by all existing and future employers, similar to the current Silver Spring TMD. The TMDs should build upon, and not supplant, existing traffic mitigation programs in the area. TMDs could mandate the following four types of general activities:
 - **Traffic mitigation programs:** require employers to develop, submit and implement a traffic mitigation plan. This technique often can draw upon public and private programs such as share-a-ride matching services or fare subsidy programs, but normally requires considerable involvement by the employer. The achievement of trip mitigation goals is often part of the requirements for new developers.



- **Data collection:** require employers to collect and submit data on employee commute characteristics for use in planning and monitoring programs, or to cooperate with TMD surveys.
- **Information dissemination:** require employers to provide employees with information on alternative commute modes, alternative work hours, and other ridesharing measures. This information could be prepared by the TMD staff.
- **Transportation coordinators:** require employers to designate an employee as a transportation coordinator to implement the traffic reduction programs.
- Encourage transit accessible land-use patterns. The layout and orientation of development can have a major bearing on the decision by workers and residents to use transit. This policy entails a variety of different actions, some of which are being developed as part of the Transit- and Pedestrian-Oriented Neighborhood Study currently underway in the Planning Department. This Master Plan encourages appropriate modification to regulatory procedures and guidelines and the development of transit accessible patterns in North Bethesda.
- Hold fare increases to the minimum. Transit ridership in an auto-oriented environment such as North Bethesda is very sensitive to transit fares. Most riders have a choice between transit and the auto and make this choice based on a variety of factors, with fares usually weighted very strongly. Even with improved service levels, higher fares will make increasing ridership difficult.
- Increase or institute parking charges and decrease parking supply. There is a good deal of evidence that the cost and availability of parking is a critical variable in estimating the level of auto versus transit use in an area. Free parking, or relatively inexpensive parking, makes the choice to drive very easy. This Master Plan recommends that a mechanism be instituted in North Bethesda to ensure that free parking for commuters is virtually eliminated for both new and existing development. If possible, any money collected through surcharges or other means by the public should be used to keep fares low.

Roadway System Improvements

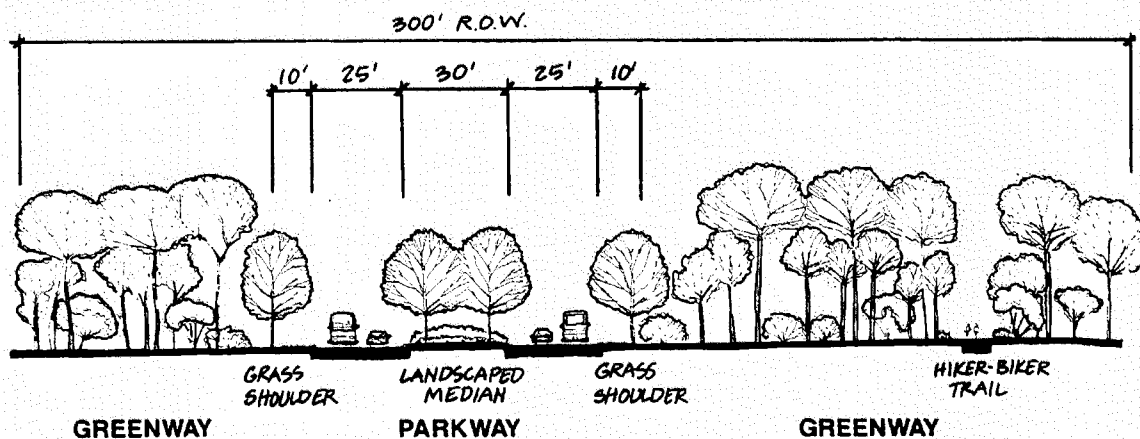
- Construct the Montrose Parkway from Montrose Road to Veirs Mill Road and maintain the remainder of the right-of-way to the west side of the connection to Montrose Road for a possible future transitway. This Master Plan envisions a divided four-lane parkway with a wide landscaped median in a portion of the former Rockville Facility right-of-way, from east of Tildenwood Lane to Veirs Mill Road. The precise alignment near the western terminus of the parkway will be determined in a future engineering study which will take into account the potential access to affected properties, environmental constraints, and appropriate road design, among other factors. It would have points of access to Rockville Pike and/or Old Georgetown Road, be grade-separated at Rockville Pike, Randolph Road, and the CSX Railroad, and would connect with Veirs Mill Road using the

old alignment of Gaynor Road. This recommendation also includes a configuration at Veirs Mill Road that would not allow any through movement to Parkland Drive from this new road. This Plan does not recommend any elevated structure at the intersection of the proposed Montrose Parkway and Veirs Mill Road. This intersection will be further addressed during the preparation of the Aspen Hill Master Plan.

In the segment of the Montrose Parkway east of Parklawn Drive, this Master Plan also endorses as an equivalent option a three-lane undivided roadway cross-section. Under this option the center lane would be reversible, operating westbound in the morning peak hours and eastbound during the evening peak hours. The lane may be for general use, or it could be reserved for high-occupancy vehicles or for buses only. Both the four-lane divided and three-lane undivided options should be evaluated, and the final selection should be made by resolution of the County Council.

This road is essential to future capacity for east and west vehicular movement across the planning area. The two existing roads, Montrose/Randolph Roads and Twinbrook Parkway, are currently congested and have high accident rates. **Future growth in the region, even with little growth in North Bethesda, makes the provision of additional capacity essential.** The parkway would add capacity, replacing capacity removed by the deletion of the Aspen Hill Road Extension. A parkway-type road, with wide medians, could be easily accommodated in the current 300-foot right-of-way with inclusion of a hiker/biker trail in a linear greenway. Additional recommendations for this new roadway include a 45 mph planned speed and prohibitions against trucks. Figure 54 shows the proposed alignment, noting recommendations concerning related actions. An illustrative section is shown below.

MONTROSE PARKWAY AND GREENWAY - ILLUSTRATIVE SECTION

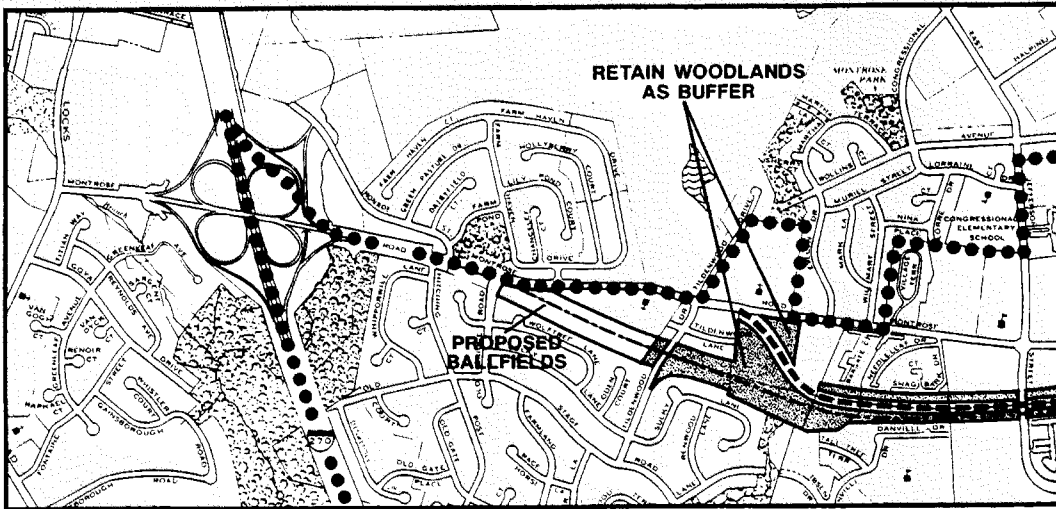


In the long-term future, beyond the time frame of this Master Plan, a transitway link to the Shady Grove transitway and Prince George's County may be desirable.



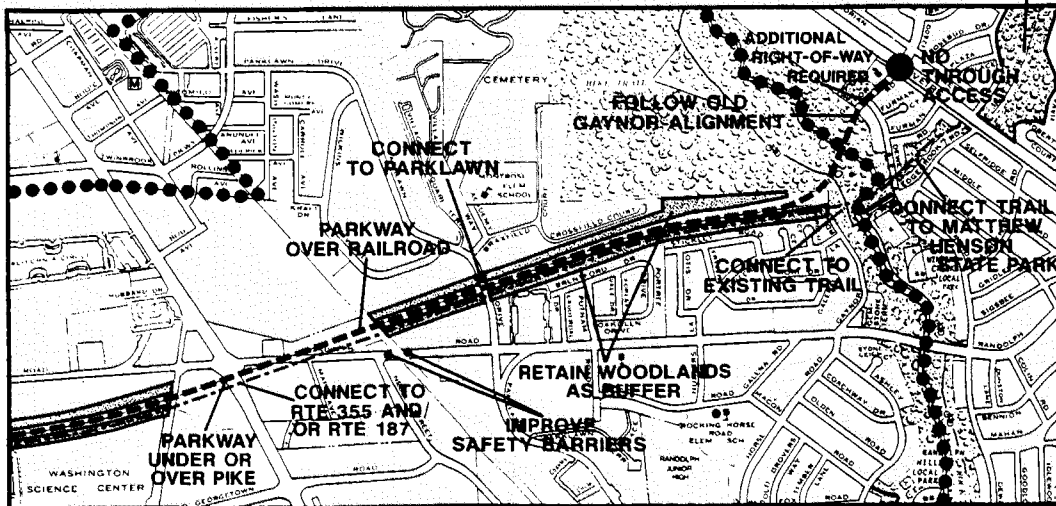
For this reason, the entire right-of-way from I-270 to Veirs Mill Road should be maintained for future transportation purposes. This Plan does not envision a roadway connection east of that shown on the accompanying maps.

- Provide Local Circulation Roads serving the Metro station areas. Figure 55 shows two new routes developed by linking together existing roads, serving existing and future activity centers. These roads would allow vehicles access and circulation through current and planned development in this area without the need to use MD 355 (Rockville Pike). This would ease congestion and increase safety and convenience. Many of the new sections can be constructed through agreements when the major parcels are developed. However, the southern link, using Executive Boulevard Extended through the site of the Colonial Manor Motel, may possibly require public acquisition, as may other segments. It is envisioned that Chapman Avenue Extended would be a non-divided Business District Street, with two travel lanes and two parking lanes. Nebel Street Extended would require four travel lanes at all times because of its higher emphasis on longer trips.
- Increase highway capacity at selected locations. (Figure 56 summarizes the recommended highway improvements). **The increase in traffic from regional and North Bethesda growth, even with conservative demand management assumptions, will necessitate major modifications to the highway network.** Traditionally, Master Plans do not specify intersection layouts, as this should be done when the demand numbers warrant actual construction. However, when grade separation or new interchanges are envisioned, these are to be included in the Plan. This Plan includes several such locations.
 - A direct connection should be made between the I-270 east spur and Rock Spring Park, connecting with Rock Spring Drive. This would provide a way for trips destined for the employment and residential uses here to bypass the more local roadway system and the current Old Georgetown Road interchange. This proposal would substantially reduce congestion on both Democracy Boulevard and Old Georgetown Road south of the I-270 east spur.
 - Widen the I-270 spurs, both east and west, by an additional lane in the median, providing for three lanes in each direction. Current patterns of congestion as well as future volumes projected for these roadways make this additional capacity essential and the increased lanes were included in the transportation network for all alternatives. If collector-distributor lanes or other means of providing for better access to the current and future interchanges are needed, these would be in accordance with this Master Plan.
 - The Fernwood Road bridge over the I-270 spur should be connected to the I-270 spur to and from the north via ramps. More extensive ramping appears difficult to construct from an engineering perspective, although it would not be incompatible with this Master Plan if designs can be devised. The ramps to and from the north would be suitable for HOV-only use, as part of a system including the I-270 bus/HOV lanes. Facilities providing for convenient transfers to




MONTROSE PARKWAY WEST

MATTHEW HENSON STATE PARK



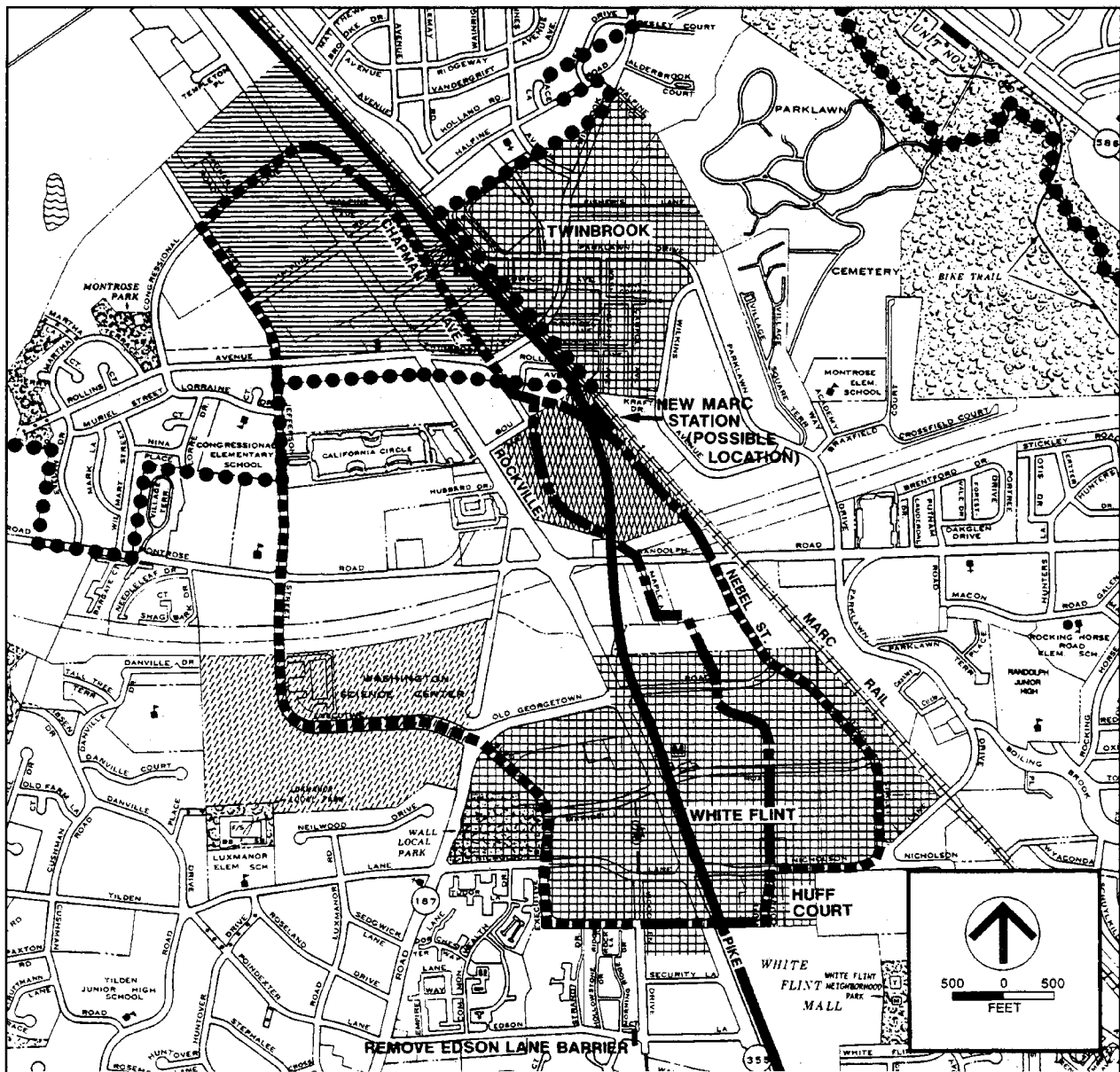
MONTROSE PARKWAY EAST

(Using Primarily the R-O-W for the Previous Rockville Facility)






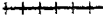
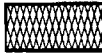


- Four-Lane Divided Parkway With Landscaped Median
- Hiker-Biker Trail
-  Woodland Buffer

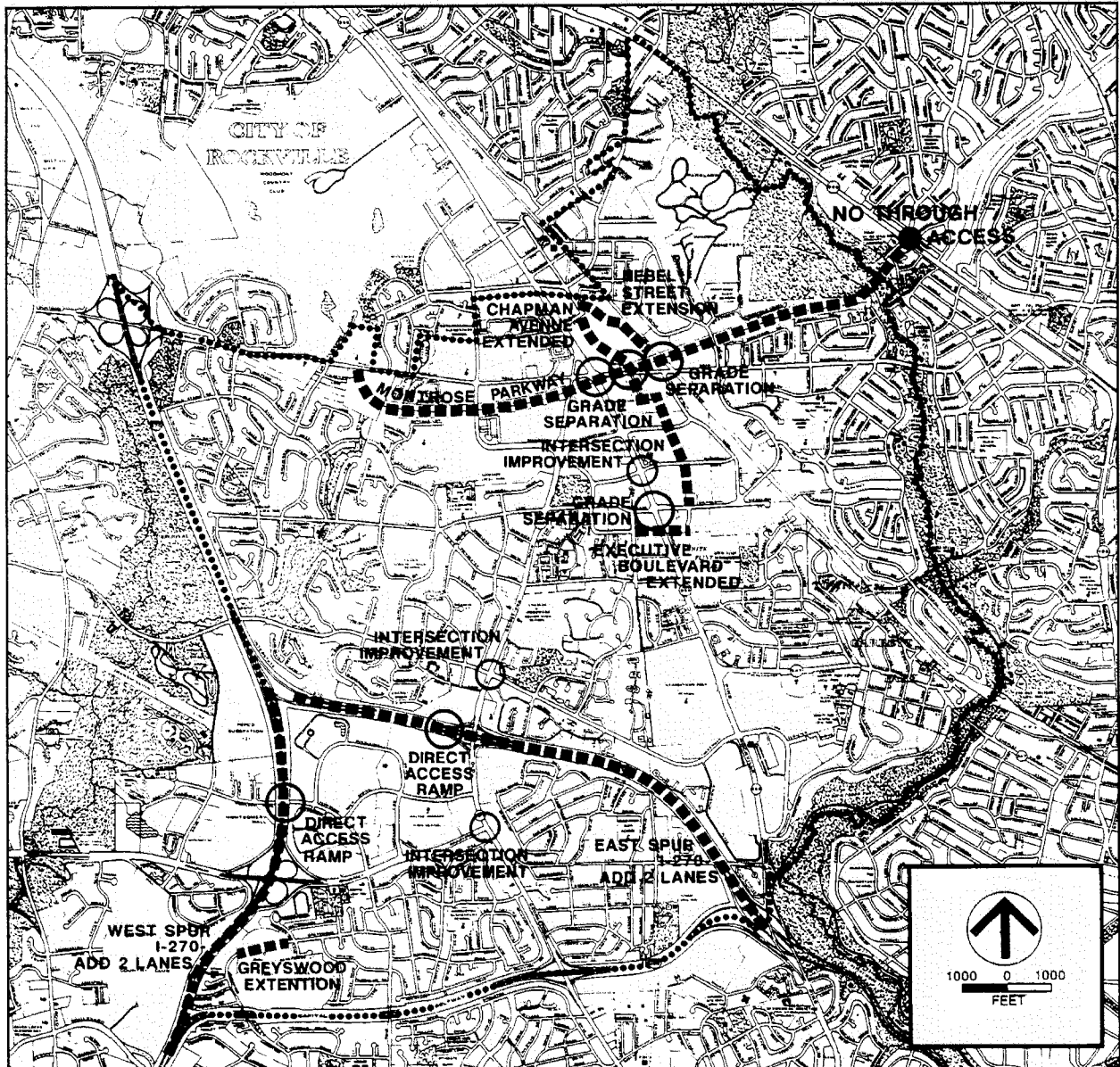
PROPOSED LOCAL CIRCULATION IMPROVEMENTS

FIGURE 55



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|---|--|---|------------------------|
|  | Sector Plan Areas |  | Existing Street System |
|  | Metro Performance District (City of Rockville) |  | Proposed Street System |
|  | Washington Science Center |  | Marc Rail |
|  | Montrose Crossing |  | Metro |
| | |  | Metro Station |



(See Urban Design Graphics for Additional Minor Streets)



better local bus service and/or a high capacity transit connection between Montgomery Mall and the Grosvenor Metrorail station should also be part of these highway improvements.

- A grade separation of Nicholson Lane with Rockville Pike appears needed in the future if growth occurs as predicted. This location will experience large volumes of both north-south and east-west traffic. Continued at-grade expansion sufficient to accommodate predicted future growth will not be possible. Rockville Pike should be kept as a high capacity major roadway and not allowed to experience severe congestion, since this will result in traffic diverting to less desirable routes such as Old Georgetown Road.
- The intersection of Marinelli Road with Rockville Pike will need additional intersection capacity, with the design dependent upon the actual configuration of the new development in the currently under-developed adjacent areas. Both vehicular movements and pedestrian crossings will be essential considerations.
- The intersections of Old Georgetown Road with Democracy Boulevard and with Tuckerman Lane are projected to experience demand above the capacity of the current configuration. A configuration that will address the future demands would include additional turn lanes. The ability to accommodate expected traffic here depends in part on other improvements to the system keeping future volumes on Old Georgetown Road from increasing beyond those forecast. The ultimate designs should provide for safe pedestrian crossings.

Unbuilt or Disconnected Streets

There are several streets on the current Master Plan that have not been fully connected or built. This Plan recommends the following actions at specific locations:

- Edson Lane between Old Georgetown Road and Rockville Pike should be connected and serve as a Primary Street. This street has been on the North Bethesda Plan since 1962, before virtually any of the adjacent development was constructed. It would serve as a connector between these two major highways and also provide access for adjacent residential areas. There is insufficient east-west movement capacity in this area and this street would provide an additional link in the street grid. Recommended restrictions on traffic include no trucks on Edson Lane, no through movement to or from White Flint Mall and turn restrictions at Woodglen Drive at some times of the day.
- One other unbuilt roadway section that should remain on the Master Plan of Highways and be constructed at an appropriate time is the Greyswood Road to Greentree Road connection. This section is potentially needed should the WMAL transmitter site redevelop.
- This Plan recommends deleting currently unbuilt sections of roadways at five locations, as shown on Figure 57. These are locations that do not have any future

significant value as portions of the network, or where the future cost and/or environmental effects of the connection are too high to justify its construction for the potential benefit. Portions to be deleted include: Aspen Hill Road from Veirs Mill Road to Twinbrook Parkway, Old Club Road to Tuckerman Lane, Stonewood Lane to Ibsen Drive, Old Stage Road to Goya Drive, Weymouth Street to Knowles Avenue.

Roadway Rights-of-Way

Table 11 identifies the recommended Master Plan of Highway and Street Classification with rights-of-way. This is used in the regulatory process as a guide to dedication and other actions. It incorporates the individual recommendations noted in other sections of this chapter.

Future Transitway Alignments

The Transportation Network Studies have identified a need to establish and preserve rights-of-way in several locations throughout the mid-County area for possible future transitways or HOV priority roads. These are links in a regional network and are not envisioned to be built within the time frame of this Master Plan. However, the preservation of the right-of-way through the designation of the alignment for future transportation allows for future decision making and implementation should demands warrant. One such link parallels the alignment of the Montrose Parkway, from I-270 to Veirs Mill Road, and is included as future transit use in this Master Plan (shown on Figure 58). The capacity of this transitway was not included in the transportation analysis for this Plan.

Development Review Regulatory Standards

- Revise the standards used for this planning area in the regulatory process at an appropriate time. The transit improvements and demand management actions noted above would justify the inclusion of North Bethesda in the AGP Group V, rather than the current Group IV. More bus services and better rail frequencies are key elements, as are the supporting policies such as parking management and Transportation Management Districts. However, these changes should be funded, implemented, and even monitored for success before the category is revised. Also, the treatment of intersections in the Transportation Management Districts should be redefined, probably emphasizing an area-wide analytic approach and definition of needed actions that would be coordinated by Montgomery County, with developer participation.

Bicycle and Pedestrian System Improvements

This Plan recommends a series of improvements to the bicycle and sidewalk network in North Bethesda, as part of an overall effort to encourage use of these modes for commuting. The overall Plan is shown on Figure 59, with key recommendations summarized below.

- Implement the current Master Plan of Bikeways, with appropriate additions recommended in this Master Plan, including the following:

HIGHWAY AND STREET CLASSIFICATIONS
North Bethesda - Garrett Park Planning Area

MASTER PLAN OF HIGHWAYS	NAME	LIMITS	LANES**	MINIMUM RIGHT-OF-WAY
<u>FREEWAYS</u>				
F-8	Capital Beltway (I-495)	I-270 Spur Rockville Pike	6, divided	300 feet
F-1	I-270	Rockville Pike to Rockville City Limits	12, divided	300 feet
F-1a	I-270 Spur	Capital Beltway to I-270	6, divided	300 feet
<u>MAJOR HIGHWAYS</u>				
M-6	Rockville Pike (MD 355)	Capital Beltway to Grosvenor Lane Grosvenor Lane to Nicholson Lane Nicholson Lane to Rockville City Limits	6, divided 6, divided 6, divided	200 feet 150 feet 134 feet
M-4	Old Georgetown Road (MD 187)	Capital Beltway to Rockville Pike	6, divided	120 feet
M-5	Democracy Boulevard	I-270 Spur to Bells Mill Road Bells Mill Road to Old Georgetown Road	6, divided 6, divided	150 feet 120 feet
<u>ARTERIALS</u>				
A-37	Twinbrook Parkway	Rockville City Limits to Ardennes Avenue Ardennes Avenue to Veirs Mill Road	6 4	104 feet 80 feet
A-64	Parklawn Drive	Randolph Road to cul-de-sac 600' west of Twinbrook Parkway	4	80 feet
A-69	Nicholson Lane Parklawn Drive Randolph Road	Old Georgetown Road to Nebel Street Nebel Street to Randolph Road Parklawn Drive to Rock Creek	4 4 4	80 feet 80 feet 100 feet
A-71	Tuckerman Lane	I-270 to Old Georgetown Road Old Georgetown to Rockville Pike	2 4, divided	80 feet 80 feet
A-81	Rock Spring Drive	Fernwood Road to Old Georgetown Road	4	80 feet

TABLE 11 (Cont'd)

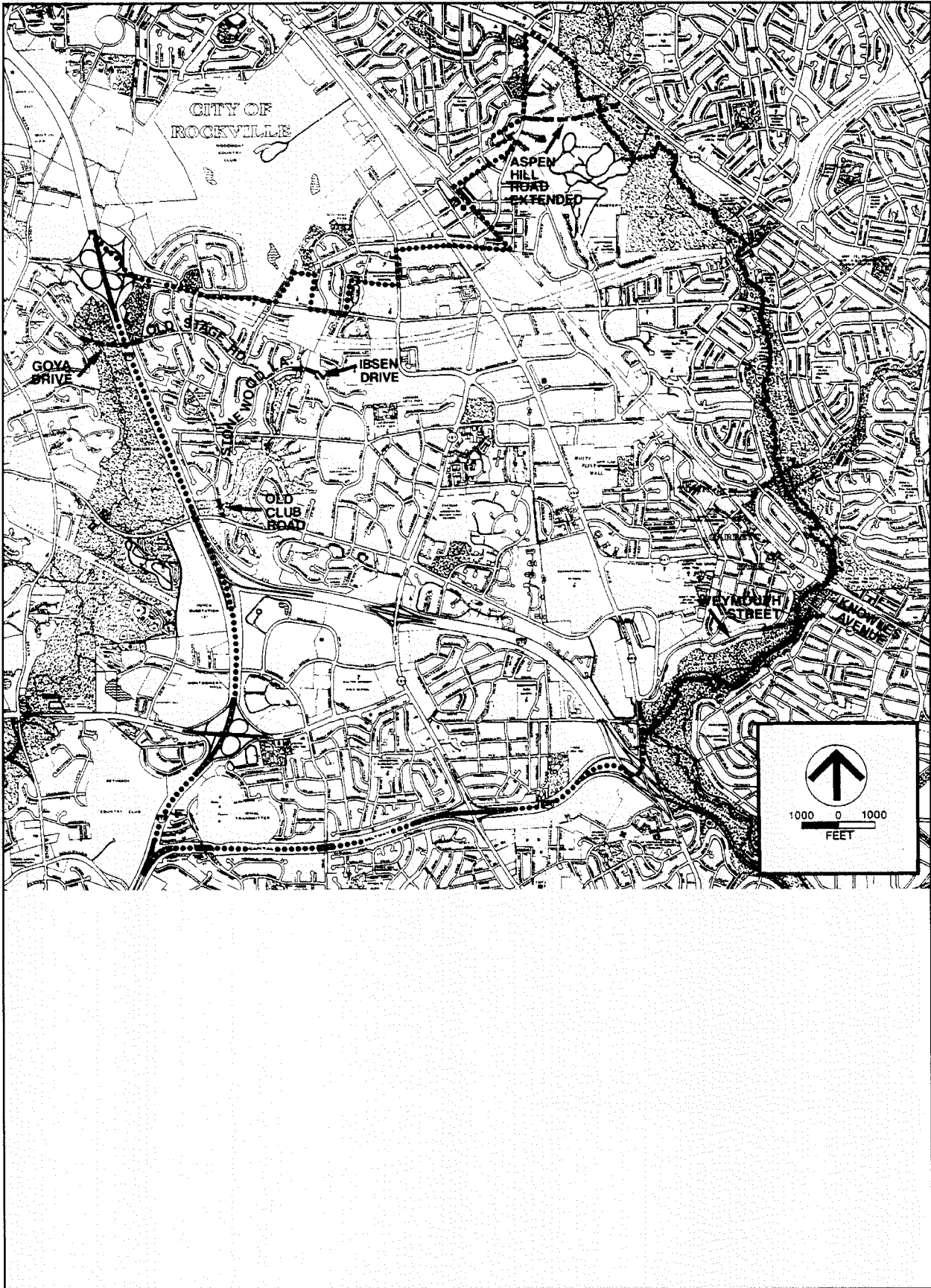
MASTER PLAN OF HIGHWAYS	NAME	LIMITS	LANES**	MINIMUM RIGHT-OF-WAY
A-85	Fernwood Road	Democracy Boulevard to I-270 Spur	4	80 feet
A-90	Montrose Road	I-270 to Old Bridge Road	4	300 feet
	Randolph Road	Old Bridge Road to Rockville Pike	4	80 feet
		Rockville Pike to Parklawn Drive	4	100 feet
A-270	Montrose Parkway	Montrose Road to Parklawn Drive	4, divided	300 feet
		Parklawn Drive to Rock Creek Park	3 or 4, div ***	300 feet
		Rock Creek Park to Veirs Mill Road ****	3 or 4, div ***	80 feet
A-271	East Jefferson Street	Executive Boulevard to Rockville City Limits	4	80 feet
A-272	Strathmore Avenue (MD 547)	Rockville Pike to Beach Drive	2	80 feet
INDUSTRIAL & BUSINESS STREETS				
B-1	Fisher's Lane	Twinbrook Metrorail Station to Parklawn Cemetery	4	80 feet
B-2	Old Georgetown Road	Rockville Pike to Nebel Street	4	80 feet
B-3	Woodglen Drive Extended	Nicholson Lane to Edson Lane	2	80 feet
B-4	Chapman Avenue	Rockville City Limit to Marinelli Road	4	70 feet
	Huff Court	Marinelli Road to Nicholson Lane	4	60 feet
		Nicholson Lane to Executive Boulevard	4	80 feet
B-5	Nebel Street	Nicholson Lane to Chapman Avenue	4	80 feet
B-6	Marinelli Road	Executive Boulevard to Nebel Street	4	80 feet
B-7	Executive Boulevard	East Jefferson Street to Old Georgetown Road	4, divided	120 feet
		Old Georgetown Road to Huff Court	4	80 feet
B-8	Boiling Brook Parkway	Schuykill Road to Nicholson Lane	4	80 feet
B-9	Wicomico Avenue Connector	Parklawn Drive to Wicomico Avenue	4	80 feet
B-10*	White Flint Avenue	Nebel Street to B-11	2	80 feet
B-11*	New Street	Marinelli Road to Old Georgetown Road	2	70 feet

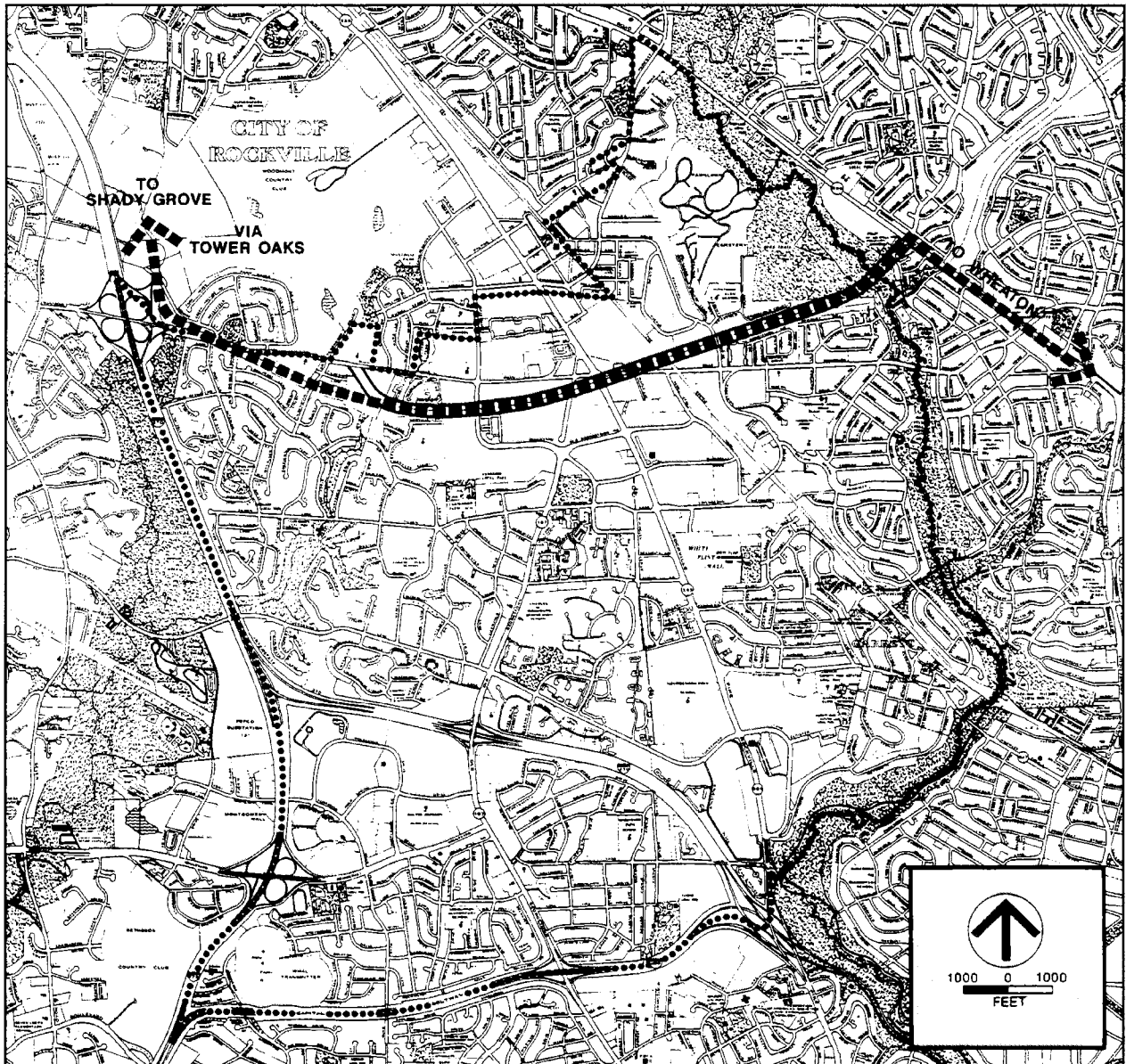
TABLE 11 (Cont'd)

MASTER PLAN OF HIGHWAYS	NAME	LIMITS	LANES**	MINIMUM RIGHT-OF-WAY
PRIMARY RESIDENTIAL STREET				
P-1	Montrose Avenue Weymouth Street	Tuckerman Lane to Weymouth Street Montrose Avenue to Garrett Park Town Limits	2 2	60 feet 60 feet
P-2	Greentree Road	Capital Beltway to Greyswood Road	2	70 feet
P-3	Greyswood Road	Greentree Road to Fernwood Road	2	70 feet
P-4	Lone Oak Drive	Old Georgetown Road to Fernwood Road	2	70 feet
P-5	Cheshire Drive Grosvenor Lane	Old Georgetown Road to Grosvenor Lane Cheshire Drive to Rockville Pike	2 2	70 feet 70 feet
P-6	Edson Lane	Old Georgetown Road to Rockville Pike	2	70 feet
P-7	Tilden Lane	200 feet east of I-270 to Old Georgetown Road	2	70 feet
P-8	Fernwood Road	Capital Beltway to Democracy Boulevard	2	70 feet
P-9	Old Stage Road	Dinwiddie Drive to Tilden Lane	2	70 feet
P-10	Farmland Drive Old Club Road	Old Stage Road to Old Club Road Farmland Drive to Tilden Woods Park	2 2	70 feet 70 feet
P-11	Tildenwood Drive	Montrose Road to Old Stage Road	2	70 feet
P-12	Danville Drive	Ibsen Drive to Tilden Lane	2	70 feet
P-13	Marciff Road	Tuckerman Lane to Tilden Lane	2	70 feet
P-14	Flanders Avenue	Rockville Pike to Strathmore Avenue	2	60 feet
P-15	Rocking Horse Road Schuykill Road	Randolph Road to Boiling Brook Parkway Boiling Brook Parkway to CSX Railroad	2 2	70 feet 70 feet

Footnote:

- * Precise alignments of B-10 and B-11 to be determined at the time of development approval.
- ** These are the number of planned through travel lanes for each segment, not including lanes for turning, parking, acceleration, deceleration, or other purposes auxiliary to through travel.
- *** The number of lanes will be determined pending further detailed engineering study.
- **** A portion of this segment is within the Aspen Hill Planning Area.





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(Beyond Timeframe of Master Plan)

- ■ ■ ■ ■ Future Transitway Alignment
- ==== Proposed Montrose Parkway

- Connect the Grosvenor and Twinbrook Metrorail stations via the proposed new MARC Rail station.
- Connect Rock Spring Park with Luxmanor and the residential areas to the north of I-270.
- Construct priority sidewalk sections as identified in this Plan.
- Include crosswalks and pedestrian crossing signals at all signalized locations in the Sector Plan areas, adjacent to all schools, and eventually, in all locations in North Bethesda.

Staging Amendment

A staging amendment will be prepared which will determine the priority and sequence of the development and the transportation elements in this Plan. For each stage, a level of development will be linked to the implementation of a set of transportation projects, programs, and policies. Prior to action on the staging amendment, the projects, programs, and policies—and the assumptions behind them—will be evaluated as to: (1) effectiveness in providing capacity and increasing the non-auto-driver mode share; (2) cost; and (3) likelihood of implementation.

5.2 THE TRAFFIC FORECASTING PROCESS

This Master Plan used a computerized model to forecast the traffic that would result from several different land use alternatives and transportation system alternatives. Several techniques were employed to provide a quantified answer to such questions as: What is the overall level of congestion in the area? Which intersections are the most sensitive to future development? By how much and in what ways can non-automobile modes of commuting be increased? The analysis, described below, focused upon periods of peak demand in the morning and evening.

A. MORNING PEAK HOUR TRAFFIC FORECASTS

The EMME2/TRAVEL 1.0 travel demand forecasting model was employed to provide an understanding of the complex interaction of development and transportation infrastructure between the region and North Bethesda. The model, using assumptions made about the number and location of future households and jobs and the future transportation system, estimated future morning peak hour traffic and daily home-to-work transit trips. The data provided by the model were summarized into both tabular and graphical products such as computer-generated maps of roadway congestion and reports of area-wide congestion level and transit use. Analysis of these and other model outputs led to the creation of alternative transportation scenarios designed to achieve acceptable traffic conditions for the North Bethesda-Garrett Park Master Plan study area.



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□□□□□□ Existing Bikeway

○ ○ ○ ○ ○ ○ Planned Bikeway

- 1 Class I An Independent Bikeway on a Separate Right-of-Way or Easement
- 2 Class II A Bike Lane on a Roadway Designated by Striped Pavement or a Physical Barrier
- 3 Class III A Bike Route on a Roadway Designated by Signing Only

B. EVENING PEAK HOUR TRAFFIC FORECASTS

Building upon the morning analysis, a series of manual techniques was used to forecast conditions during the evening peak, typically the most congested time of day. M-NCPPC local trip generation rates were applied to employment, shopping and residential sites, or clusters of sites, in the North Bethesda study area to determine the number of trips leaving and arriving at these sites in the evening. Trips were routed through the study area based upon expected roadway preferences. As a practical matter, determining the point at which trips exited or entered the study area could not be determined using manual techniques; instead, it was assumed that those trips leaving, entering, and passing through would do so in approximately the same proportion as in the morning.

The evening analysis focused upon conditions at selected intersections expected to experience the heaviest demand. Critical Lane Volumes (CLV), a standard measure used in local area review to measure the performance of an intersection, were calculated for this analysis. Intersections forecast to exceed their capacity were examined further to determine how much benefit might be derived from selected intersection improvements.

The effect of increased transit service and transportation demand management on auto use was estimated using results obtained from policies like those contemplated in this Master Plan in similar locations, an established technique known as elasticity analysis. Using travel information developed by the EMME2/TRAVEL 1.0 model as a starting point, percentage decreases in auto trips estimated with the elasticity analysis were applied to the generation of evening trips, resulting in reduced volumes at the intersections under study. In summary, the beneficial effects of the transit recommendations were accounted for in determining the need for roadway changes.

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C. TRAFFIC FORECASTS AT PORTALS

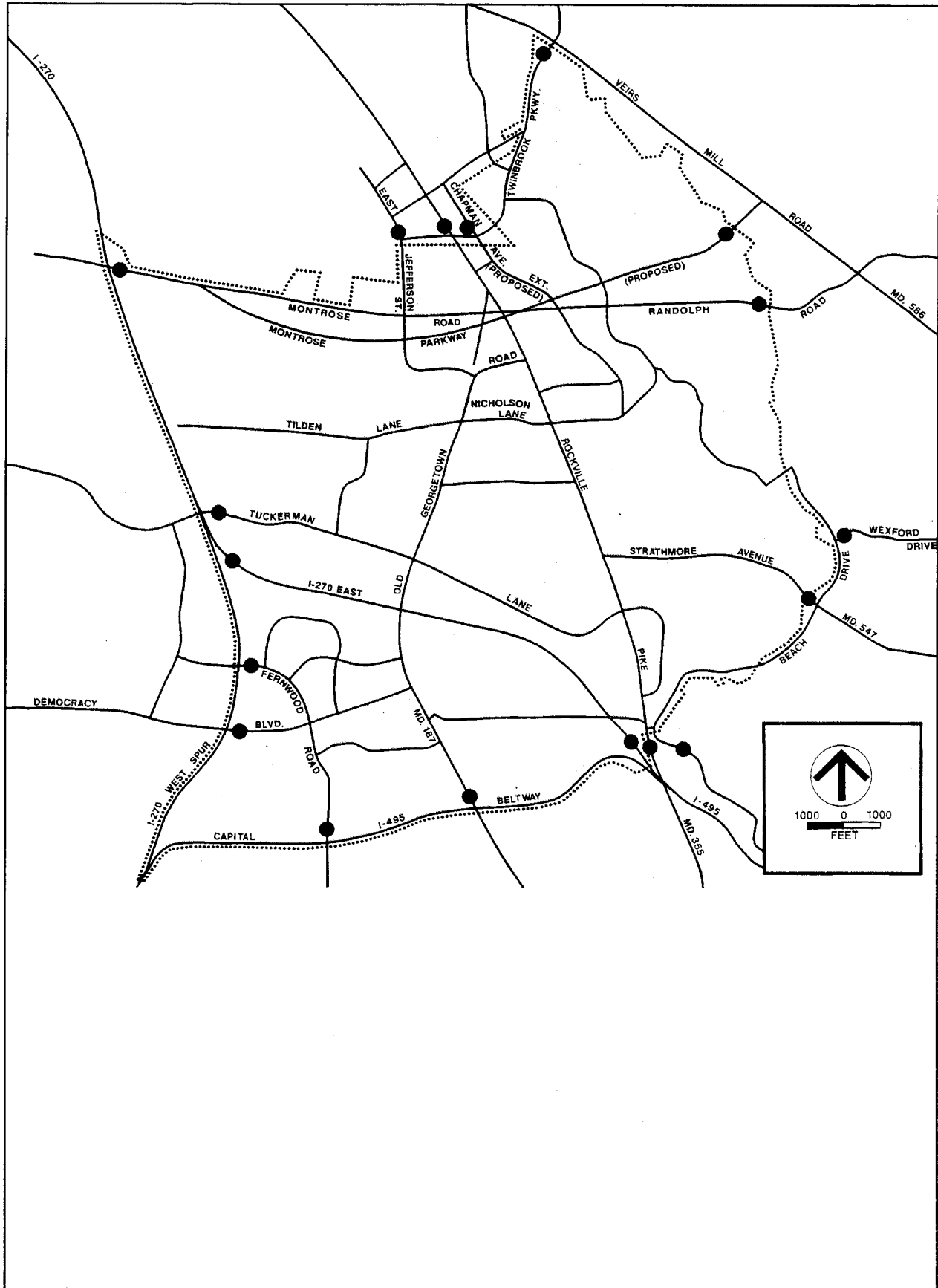
Portals are sections of roads where vehicles “enter” and “exit” the planning area. Figure 60 locates the portals used in the analysis. Figure 61 shows the 1987 and forecast total morning peak hour traffic coming in across the portals. Along with the traffic in 1987 (shown in the left-hand column), year 2010 traffic from three growth scenarios is presented. For conditions inside North Bethesda, the future scenarios make the following assumptions, including in all cases future development in the surrounding County and region:

- Scenario (a): 1987 land use.
- Scenario (b): 1970 Master Plan and 1978 Sector Plans land use.
- Scenario (c): Preliminary Draft Master Plan land use with transportation demand management, transit and roadway improvements.

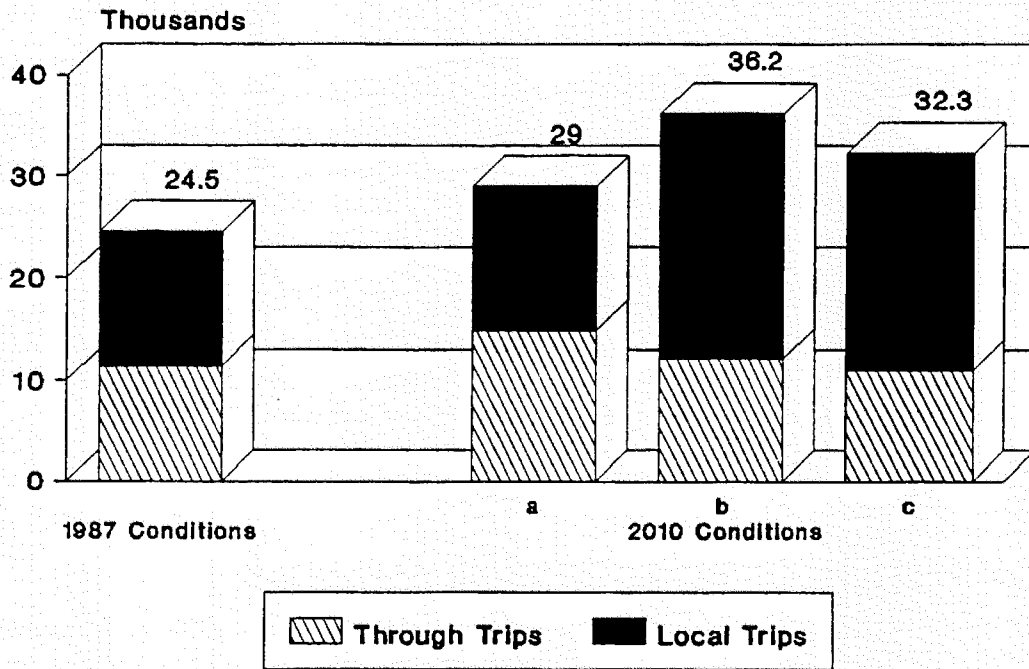
Several points can be discerned from Figure 61. First, scenario (c) shows an 11 percent reduction in inbound traffic relative to the 1970 Master Plan and 1978 Sector Plans. These reductions are important in the effective operation of key intersections within North Bethesda.

LOCATION OF PORTALS FOR HIGH-CAPACITY NETWORK

FIGURE 60



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- Future Scenarios**
- a - Regional Growth with 1987 Land Use in North Bethesda
 - b - 1970 Master Plan and 1978 Sector Plan
 - c - Preliminary Draft Master Plan Land Use with TDM, Transit, and Roadway Improvements

Source: M-NCPPC Transportation Division



The graph also shows the importance of development occurring outside North Bethesda. In scenario (a), with no additional development inside the study area, traffic coming in through the portals increases 18%, which is roughly one-third of the increase resulting from (b) and over half of the increase found in (c). To understand this, one must note the through traffic in each scenario (striped bars). For (a), more than half of the traffic entering North Bethesda (including I-270 and its spurs) continues on to other destinations. If future development within North Bethesda is limited, then through trips increase, keeping the total portal volumes high. With (c), more employment opportunities cause trips to end in North Bethesda. Only one-third of the total traffic passes through the study area. **This highlights the fact that changes in local development have a limited ability to change traffic volumes on the major highways.**

5.3 RESULTS OF ROAD SYSTEM ANALYSIS

The most complicated portion of the transportation system analysis was that of the roadway system. It was necessary to forecast morning and evening future peak-hour volumes at intersections, while taking into account non-physical aspects such as demand management in the area. The EMME2/TRAVEL model discussed in the analysis methodology section was very valuable and formed the basis for the more detailed intersection analyses presented here. It should be noted that several assumptions go into a future analysis such as this and that the recommendations are therefore somewhat general and frequently refer to future decisions for more detailed design.

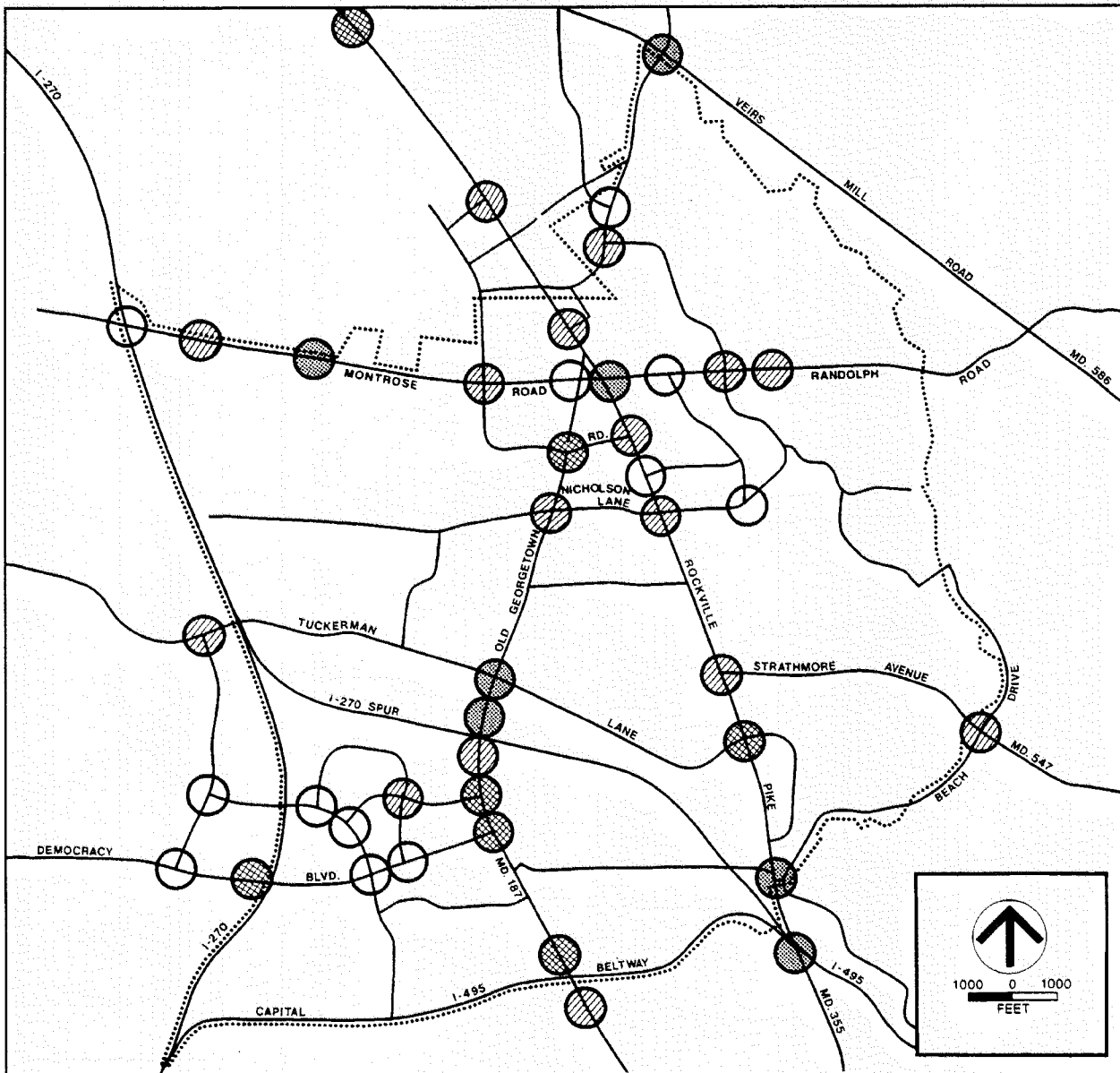
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A. PORTALS

The roadway system analysis included two primary aspects: the 18 portal roadway links and the intersections internal to North Bethesda. The portals were included because it was essential to ensure that at key entry points vehicles could travel both through and to North Bethesda. Also, by analyzing the portals, a better understanding was gained of some of the reasons for impacts being noted on the internal network, as identified in an earlier section.

Portals are the major roads leading into and out of North Bethesda. While they do not include all roads into and out of the area, they represent the vast majority of the capacity for entering and exiting the area. The analysis grouped portals into directions for identifying capacity constraints, since all roads serving trips from the same direction could normally be chosen by motorists from that direction. Even if one road is congested, others may be available.

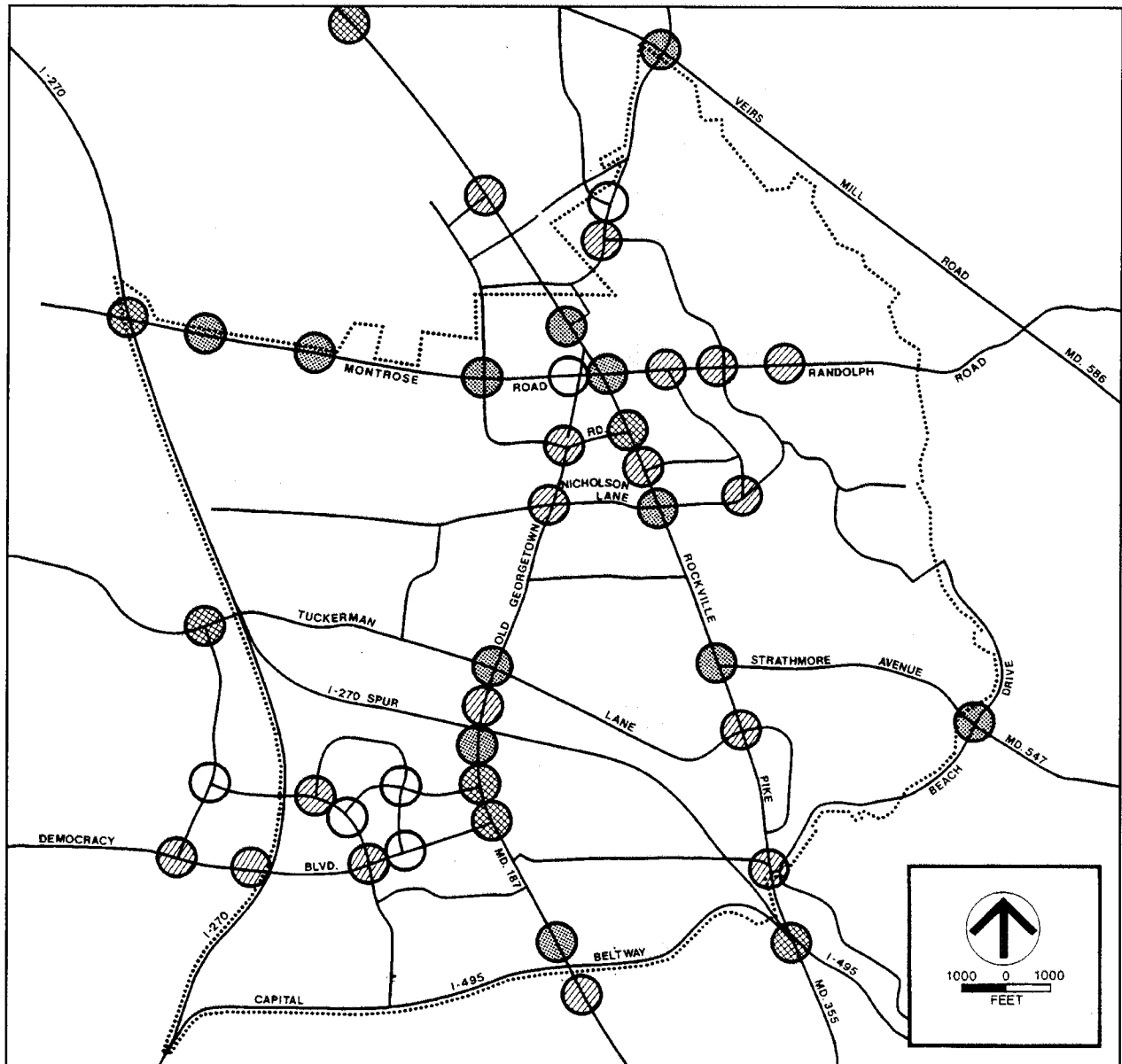
The analysis showed that all directions have capacity higher than the demand (forecast future volumes) when the roads are taken together. From the east, if the Montrose Parkway is included, demand is approximately 63% of the capacity. However, if the Montrose Parkway is removed from the analysis, the demand virtually equals capacity. Since these are link capacities, that would be a potentially serious situation because intersections along links are usually more congested than the links themselves. This highlights a consistent finding: **the proposed Montrose Parkway is critical to the North Bethesda roadway network.**



(A.M. Peak) 1989 Conditions

Level of Service	Critical Lane Volume Ranges
○ A - B	0 - 1172
▨ C - D	1173 - 1472
▩ E	1473 - 1622
● F	1623 or more

Source: North Bethesda – Garrett Park Issues Report, December 1989.



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(P.M. Peak) 1989 Conditions

Level of Service	Critical Lane Volume Ranges
○ A - B	0 - 1172
▨ C - D	1173 - 1472
▩ E	1473 - 1622
● F	1623 or more

Source: North Bethesda – Garrett Park Issues Report, December 1989.

B. INTERSECTIONS

In addition to analyzing the portals, considerable resources were invested in evaluating the future conditions of intersections within the planning area. These are critically important since they serve both through and locally destined trips and, in many instances, are already very congested. Figures 62 and 63 show the 1989 Levels of Service at selected intersections in North Bethesda. A number of locations along MD 355, Old Georgetown Road, and Montrose/Randolph Roads are in the range of E or F, indicating heavy congestion. Additionally, accident levels on Montrose and Randolph Roads are well above County averages, due to a combination of high volumes and unsuitable road design.

The functional designation on the Master Plan of Highways of both Rockville Pike (MD 355) and Old Georgetown Road is the same: Major Highway. However, the historic function of the two is somewhat different. Rockville Pike has evolved to be a heavily traveled and commercially-oriented highway. Commercial development is virtually continuous from Hillery Way to the Rockville City center. The Pike also serves many trips traveling through the area, which is appropriate for a major highway. This Plan recommends major upgrading of several key locations to ensure this road continues to be able to meet significant travel demands.

Old Georgetown Road is viewed as somewhat less critical for through trips and has much less intense continuous development. The Plan attempts to keep Rockville Pike more attractive for through trips, in order that improvements to Old Georgetown Road can be minimized. However, there are still locations along Old Georgetown Road where improvements are essential for future conditions.

The analysis identified several locations where major congestion can be expected with current roadway configurations. This analysis assumed Year 2010 growth in the region, with the preferred land use option in North Bethesda. The transportation system included successful demand management with increased transit levels and additional roadway improvements of the Montrose Parkway, Fernwood Road bridge over the I-270 spur, and the local circulation roads parallel to Rockville Pike, all referred to in the following sections. **It is evident that current congestion patterns will remain, unless the improvements listed below are provided.**

This analysis has resulted in the development of the following recommended roadway improvements. Detailed designs have not been attempted, since that will be appropriate at a later date when future travel patterns have emerged. The following descriptions identify the general nature of the needed improvement. Not every intersection in North Bethesda was analyzed in detail, so capacity improvements may be needed at other locations. These may be identified at the time of Local Area Transportation Review or through other analysis.

- Interchange expansion at Old Georgetown Road and I-270, providing for ramps into and out of Rock Spring Park. **This is essential due to the large volumes of peak-hour trips entering and leaving this relatively compact area.** Currently there are only three exit locations, with a fourth planned via the Fernwood Road



bridge over the I-270 west spur. However, SHA forecasts are that the Old Georgetown Road interchange will be severely congested in future years, exacerbated by the need for all trips using Rock Spring Drive from the I-270 east spur to pass through the interchange. The IBM expansion makes this new ramp essential. The new ramp can well serve the additional development expected in this Master Plan. **This improvement is needed in addition to the transit link to Grosvenor because of existing development and the currently limited access system.**

- Ramps from the planned Fernwood Road bridge over the I-270 spur will address similar problems to those noted above. This link is not as high a priority as the Old Georgetown Road/I-270 east spur interchange, because it would not serve as many potential trips. However, these ramps offer good potential as HOV-only, providing access for buses and ridesharing to the planned I-270 bus/HOV lane. A general feature that should be provided is a facility for convenient transfer to either local bus service or the high capacity transit connection between Montgomery Mall and the Grosvenor Metrorail station. Previous initial engineering analysis indicated that full ramping here would be difficult, but if additional ramps other than those serving trips to and from the north on I-270 can be accommodated, they would be appropriate for this Plan.
- Grade separation of Nicholson Lane at Rockville Pike. Rockville Pike is expected to maintain its position as a significant north-south roadway in North Bethesda. Significant new development is anticipated at Grosvenor, White Flint, and Rockville and through trips will increase as regional growth continues. The continued growth of east-west movement which is expected will make movements on Nicholson Lane important to traffic circulation. Unconstrained demand estimates for peak hour trips are well beyond the capacity of the current intersection or what could be built at-grade. Providing for grade separation here would reduce a potentially serious traffic constraint to the area.

This improvement would support the concept of keeping Rockville Pike as the high-capacity major roadway, which would attract through trips and meet demands of the White Flint area and the City of Rockville. It would also be appropriate given the additional at-grade local circulation streets parallel to the Pike being recommended in this Plan. Whether Executive Boulevard Extended can cross Rockville Pike as part of the design of the Nicholson Lane project has not been determined, but it would be desirable.

- **Marinelli Road with Rockville Pike:** The configuration of this intersection cannot be determined at this time. The actual mix and access locations of the developments adjacent to it will determine the demands. To the extent possible, these developments should make use of the local circulation streets recommended. Volumes on Rockville Pike are expected to be high, as noted in the Nicholson Lane findings above. Access to these new developments can generate many trips that will necessitate high turning movements that are difficult to accommodate at-grade. One key objective is ensuring that buses can move

through the area without delay, perhaps requiring some bus-priority for short sections. Pedestrians are also an essential consideration, although a pedestrian underpass of Rockville Pike is already in place on the north side of Marinelli Road.

- **Old Georgetown Road at Tuckerman Lane:** This intersection currently experiences high critical lane volumes because of the relatively high traffic volumes and somewhat restricted geometrics (number and type of lanes). Improvements have not been made recently because of the potential negative impact on adjacent development. This Plan does not recommend specific changes but identifies the need for improvements here. It may be that demand management, transit, and increased emphasis on Rockville Pike for many trips will reduce future volumes for some time to come, but even taking these into account, future traffic is well above current capacity. In addition to Local Area Transportation Review consequences, motorists would experience additional delay at this intersection. Provisions for safe pedestrian movements must also be included in any future designs for these intersections.
- **Montrose Parkway with Rockville Pike:** A grade separation of Rockville Pike with Montrose/Randolph Road has been identified as desirable for many years and has been in previous Master Plans. This Plan recommends that this be accomplished through the construction of a new roadway in the available right-of-way which would cross Rockville Pike and the railroad tracks at separate grade.

C. LOCAL CIRCULATION AND STREET NETWORK

Nebel Street, Chapman Avenue, and East Jefferson Street Extensions

Local circulation streets parallel to Rockville Pike are an essential component of this Plan. These streets serve several valuable purposes. They provide for access and circulation to existing and new development. They provide for access and circulation to existing and new development. Creating a local street grid makes development more pedestrian-friendly and spreads the vehicle trips over several streets. This provides an alternative to Rockville Pike for many short trips, significantly reducing future volumes on the Pike. These streets are included in this Plan both to provide capacity, and as a framework for more local streets provided through subdivision of the larger parcels.

This Plan recommends placing the collector-distribution function for the north-south movement on Nebel Street, current and extended, using an alignment extending from its current terminus, to a new intersection with Chapman Avenue. This would be a four-lane Business District Street 48 feet wide, within an 80-foot right-of-way, forming a complete eastern section of the loop road from Executive Boulevard extended, to Bou Avenue. The revised configuration of the connection with Bou Avenue would emphasize the through-trip nature of this road, as opposed to the more local character of Chapman Avenue Extended.

Within the Montrose Crossing property, the alignment would follow the existing C-2 zoning line, or alternatively, follow the line of the Metro tunnel easement. The latter alignment would maximize the amount of developable area on the existing C-2 portion of the property.



Chapman Avenue Extended is recommended as a 40-foot-wide street with a 60-to-70 foot right-of-way (not a current standard in the Road Code), for two moving lanes with parking on each side. This would provide a route for shorter distance, local access trips, needed in addition to Nebel Street. Chapman Avenue Extended in this configuration would have two phases. The first phase, from Nicholson Lane to Randolph Road, would be accomplished as part of the anticipated development of adjacent parcels. The second phase, north of Randolph Road, is envisaged as very long term, possibly beyond the time frame of the Master Plan, only being constructed if and when the Montrose Crossing site is comprehensively redeveloped. The precise alignment for the segment north of Randolph Road should be determined at the time of this redevelopment, and also whether the segment should be a public or private street.

The purpose of Chapman Avenue Extended is to provide a framework for local circulation vehicle trips, including shuttles, and not to compete with Nebel Street for north-south internal trips. The intersection configurations would allow for but not emphasize through movement, the alignment of the street could contain some curvature, and the streetscaping would emphasize the more local nature of the street. The location of the exact alignment should be flexible, as it will be dependent upon future development plans for the large parcels served by this proposed street.

Extending East Jefferson Street north into the City of Rockville has been discussed several times and has been part of previous draft City plans. This extension has considerable merit but would only be feasible if the Montrose Parkway is built to provide relief to the current East Jefferson-Montrose Road intersection.

A bus-only street between the Metrorail stations at Twinbrook and White Flint, using the extended Chapman Avenue, was examined. This has not been recommended because it is incompatible with the land use and urban design objectives recommended in this Plan.

Unbuilt or Disconnected Streets

This Plan recommends completion of several streets now on the Master Plan of Highways and the removal of five not believed to be needed. These are presented in the Recommendations, with the following comments addressing one specific situation.

Edson Lane: This Plan recommends that Edson Lane serve both adjacent residences and some through trips as a key link of the overall roadway travel network. The street is virtually fully constructed and is fully dedicated to Montgomery County, with only a temporary barrier between the intersections with Sugarbush Lane and Woodglen Drive. This Master Plan recommends that the barrier be removed with the following conditions:

- No trucks at any time except for local access
- No through traffic to or from White Flint Mall. Prior to removal of the existing barrier, the intersection of Edson Lane and Rockville Pike should be channelized and signalized so these through movements are both legally prohibited and physically precluded to the extent possible.

- Turn restrictions during peak periods at Woodglen Drive to preclude traffic from the Security Lane office development.

In addition to restricting roadway system capacity and circulation for the adjacent residences, the existing situation limits access for police, fire, and emergency services. The cross section, alignment, and placement of adjacent development presents no unusual safety or capacity concerns when viewed in relation to normal standards. Sidewalks are present along the entire length, and sight distances are good. The recommended major restrictions to selected movements would further reduce undesirable effects on the adjacent residential areas.

Tuckerman Lane

This Plan recommends that a median be constructed on Tuckerman Lane between Old Georgetown Road and Rockville Pike, if feasible.

Residential Streets

This Plan recognizes a need for effective actions to control speeding and to discourage large numbers of commuter vehicles from residential streets. Such actions are recommended regardless of the particular classification of the residential street: primary, secondary, or tertiary.

5.4 RESULTS OF TRANSIT SERVICES ANALYSIS

Public transportation can play a key role in the transportation capacity for North Bethesda. There is already a full range of transit services available: Metrorail, Metrobus, Ride-On, private circulation shuttles, and MARC. However, the transit ridership as a percentage of trips is low compared to more urbanized sections of the County such as Bethesda or Silver Spring, particularly for workers coming to the area. This is a major factor in the roadway congestion now experienced in the area. This Plan envisions an ambitious program of increased services and supporting policies (outlined here and in the sections concerning Transportation Demand Management) to greatly improve the use of transit.

There is a moderate amount of bus service available in North Bethesda provided by Ride-On and Metrobus. Many routes operate on 30 minute headways, although some do have 15 to 20 minute headways in the peak hour. These frequencies are considered marginally attractive for an increasingly urbanized area such as this. Virtually all routes feed into the Metrorail system. Figure 64 is a transit coverage map showing the areas in North Bethesda within one quarter mile of a Metro station or with easy access to a bus line. Most areas other than low-density residential areas have service, but headways and other policies minimize its use compared to auto. A summary of current use of transit and carpools for commuting is shown in the following table (from the Metropolitan Washington Council of Governments (MWCOG) 1988 Home-Interview survey):



Current Commuting Patterns, Daily Home To Work (%)

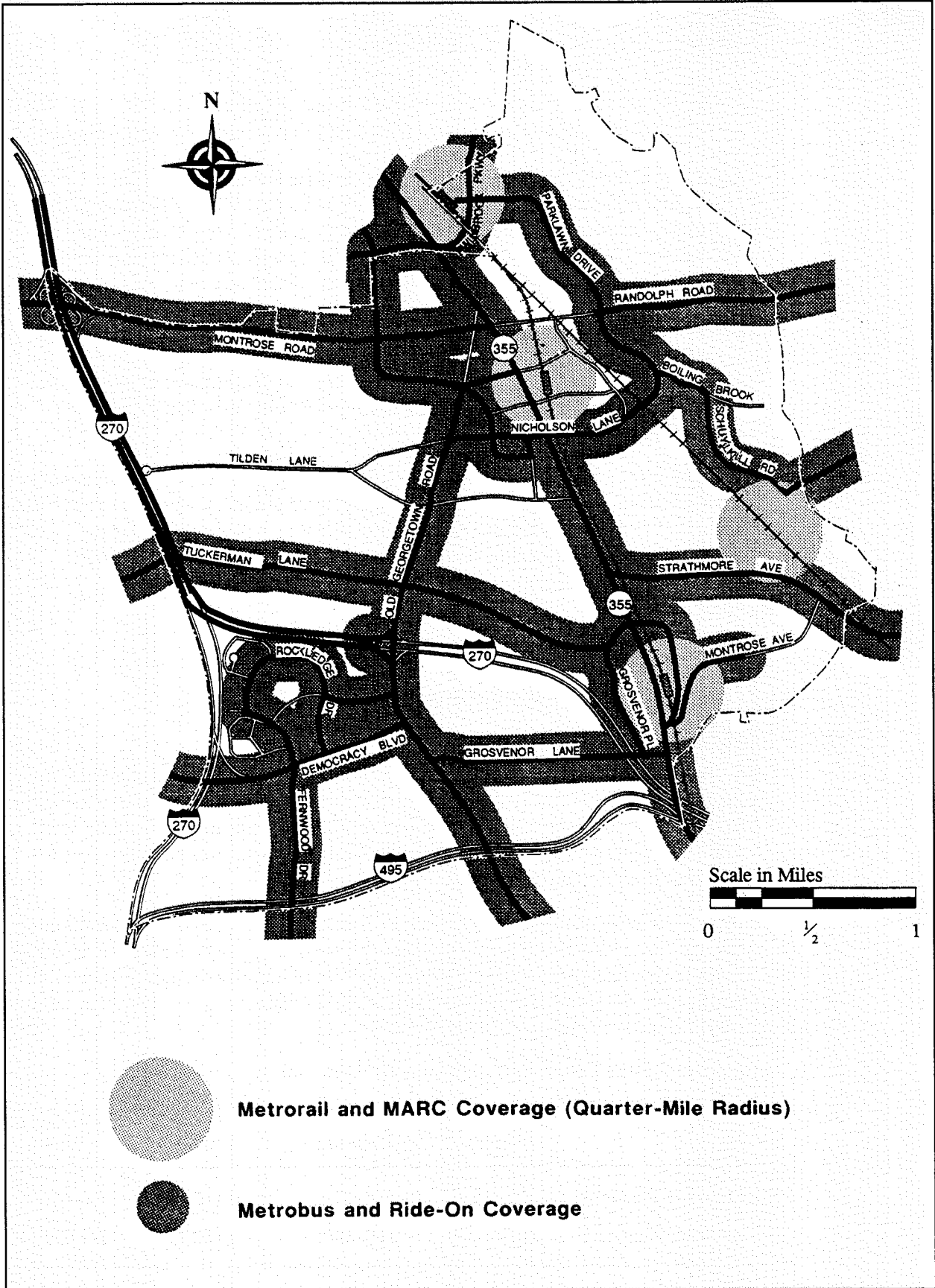
	Auto Driver	Auto Passenger	Transit	Walk Bike
No. Bethesda Residents	74	9	14	3
No. Bethesda Workers	85	6	8	1

There are three Metrorail stations in the North Bethesda area. Currently, trains arrive at the Grosvenor Station approximately every three minutes in the peak hour. However, one-half of these northbound trains stop here and return inbound on the Red Line. In the morning, seats are frequently not available by the time trains reach White Flint because of the large number of passengers boarding at Shady Grove, Rockville, and Twinbrook. Morning peak period (6:30-9:30 AM) counts by Metro in 1987 indicated trains at 187% of the seat capacity when they arrived at the White Flint station.

This Master Plan recommends significant increases in transit services. Supported by other appropriate policies and funding, these can bring many thousands of new riders to the transit system. Even current trends will require some changes, since the new jobs and households will increase ridership significantly.

To summarize the recommendations:

- Eliminate the current turn-backs of northbound trains at Grosvenor Station, so that all trains travel through to Shady Grove. As demands grow, increase the train frequency to every two minutes in the peak hour. This is feasible with current control equipment.
- Reduce headways (increase frequency of buses) on many routes in North Bethesda. Add new bus services between key activity centers, using the recommended local circulator streets in some instances. The I-270 bus/HOV lane will provide an ideal route connecting up-County locations, or even Frederick County, with Montgomery Mall and Rock Spring Park. It could also become part of a more extensive regional network of HOV roadways or lanes. Circulator services in Rock Spring Park and Metrorail station vicinities as they develop would be appropriate.
- Supportive policies include keeping bus and rail fare increases below inflation. To do otherwise means that use of transit has no financial advantage over the use of the auto. If auto costs are increased through gasoline taxes or other means, this would accomplish the same differential. This Plan assumes that fares go down relative to auto costs over the life of the Plan.
- Provide a MARC station near Montrose Crossing and increase train frequencies. MARC service provides an alternative for long-distance commuter trips which, when made by automobile, have a very negative impact on the road system.





MARC ridership increased 66% on the Brunswick line between 1987 and 1991 and these actions would reinforce this trend to the benefit of North Bethesda.

- Figure 7 shows the dispersed residential patterns for DHHS employees. Assuming new development has similar patterns to that of HHS, many of the longer-distance trips originating between Martinsburg, West Virginia, and Gaithersburg could be attracted to MARC if a convenient station were available. Connection with local circulation bus services would add to its attraction.
- Increase the frequency and coverage of shuttle-type services linking the Metrorail stations with nearby office, retail, and residential areas. A study by The Urban Mobility Corporation for MWCOG provides good guidance for expansion of these services. The success of this current White Flint shuttle indicates their potential and value.

An important finding from the analysis of transit services is that the physical services themselves will have minimal effects on attracting new ridership. Only by combining them with strong transit incentives and changes to auto-oriented public and private policies will transit use change significantly. These policies are outlined in the following section on Transportation Demand Management.

5.5 RESULTS OF TRANSPORTATION DEMAND MANAGEMENT ANALYSIS

Transportation Demand Management (TDM) is the general term for actions taken to reduce the number of peak-hour vehicles on the roadway network. These actions are aimed at increasing the use of non-auto driver modes, including public transportation, car and van pools, biking and walking. This Plan envisions a strong TDM program in North Bethesda, with emphasis on the Metrorail stations and Rock Spring Park areas.

The relatively low levels of transit use now in North Bethesda, and especially in the Rock Spring Park area, mean that major increases are both possible and needed. The recommendations in this Plan are estimated to significantly increase the percentages of the non-auto modes. Estimates of future use resulting from the recommended programs are in the following table, with percentage changes from current pattern percentages noted in parentheses.

Future Commuting Patterns, Daily Home to Work (%)

	Auto Driver	Auto Passenger	Transit	Walk Bike
No. Bethesda Residents	70(-5%)	10(+11%)	15(+7%)	5(+67%)
No. Bethesda Workers	61(-28%)	21(+250%)	16(+100%)	2(+100%)

These patterns are ambitious, but feasible if all the recommended program aspects are available: incentives to transit and HOV and increases in the relative costs of auto use. If successful, decreases in the share of auto use compared to total commute trips of about 15% can be expected. As structured, these programs would primarily affect local trips, both work and residential, and not influence through trips except for Metrorail.

If the recommended programs were instituted on a County-wide basis, they would have positive influences on North Bethesda by reducing through trips and influencing the other end of North Bethesda-destined trips, as well as on local conditions elsewhere.

The actions in this Plan are complementary and need to be instituted as a package for optimal results. As noted above, increasing transit services without the supporting policies will have minimal effect. The policies themselves work best with improved transit providing auto alternatives. The analysis did not identify “savings” in trips from individual actions, but instead defined a future structure of demand management actions that, taken with the roadway improvements and the bike and pedestrian changes, makes for a balanced system.

The analysis identified both transit fares and parking changes as particularly important elements of TDM efforts. Predicting future transit and HOV use is a difficult analytic task, but sensitivity of auto use to these actions has been shown in many instances historically and is a basic element in analytic procedures.

The development of the recommended actions is discussed below.

- Create one or more Transportation System Management Districts (TMDs) around, at the least, the Metrorail stations and Rock Spring Park. This recommendation forms the basis for many of the other actions, by creating an entity that can both encourage demand management and mandate compliance with certain programs and even accomplishment of some mode share goals. The current TMD in the Silver Spring CBD was the model for this recommendation. It was anticipated that each of the Districts could have these basic activities:
 - traffic mitigation programs
 - data collection
 - information
 - transportation coordinators

Implementation methods will need to be defined for each area, due to significant differences in characteristics.

- Encourage transit accessible land-use patterns. It is becoming increasingly apparent that the relationship of development to nearby transit services is an important element in the use of transit by workers, residents, and visitors. The transportation elements of this Plan recognize this link and encourage compliance with transit and pedestrian-friendly design principles. The transportation analysis assumed that the transit services provided in the future would be accessible to



residents and employees, in part due to design changes and in part due to increased systems of pedestrian and bicycle pathways discussed in a later section.

- Hold fare increases to the minimum. Transit fares are a critical element in the decision of commuters to use transit. Most riders have a choice between transit and the auto and make this choice based on a variety of factors, with fares usually weighted very strongly. This Plan assumes that transit fares would not be raised with inflation over the life of the Plan, but would lag somewhat behind. This would mean that transit costs would drop relative to the costs of operating a car, an important element in the overall transit-use decision. It may be that auto costs will rise significantly due to increased taxes and oil prices and this would accomplish the same goal.
- Increase or institute parking charges and decrease supply. There is a good deal of evidence that the cost and availability of parking is a critical variable in estimating the levels of auto versus transit use in an area. Because of this evident link and because current trends in North Bethesda tend toward charging for parking, the transportation analysis used significantly increased relative parking charges when forecasting future transit use. Sensitivity tests indicated that increased charges were a major factor in expected transit levels and that, if charges do not rise, other transit and demand management programs will be much less successful.

The actual mechanisms for instituting parking charges and eliminating free parking are not defined, since the Plan is considering only the expected final result. Many different mechanisms may be used, based on the conditions when the legislation is developed. Related actions such as providing funds collected from parking surcharges or other means to subsidize transit services would be very much in keeping with the spirit of this Plan's recommendations.

5.6 RESULTS OF DEVELOPMENT REVIEW REGULATORY STANDARDS ANALYSIS

Development in a Master Plan area is dependent not only upon the zoning, but upon the standards used to review development proposals. This Master Plan recommends appropriate standards for some situations which would be consistent with the actions recommended in the Plan. These standards would have to be modified through their applicable process and are not suggested to be included in the adoption process for this Master Plan.

The current (FY 91) Annual Growth Policy classifies North Bethesda within Transit Group Classification IV, which has an average area-wide level of service of D. This is appropriate given the current transit services. This Plan recommends significantly increasing both the transit services and supporting policies. Only if these recommendations are carried out would a change in the classification to V appear appropriate. This change would reflect the higher availability of transit as a transportation alternative within the area and show a commitment to encouraging transit use. Currently, Bethesda/Chevy Chase and Silver Spring/Takoma Park are in the Group V.

5.7 RESULTS OF RESERVATION OF FUTURE TRANSITWAYS ANALYSIS

This Master Plan includes an alignment for a possible future transitway. A *transitway* is a path for transit, separated from other vehicles. It could be theoretically for heavy rail (unlikely here), light rail, buses, or even other technologies. An interim use might be for buses and ridesharing. The alignment shown on Figure 58 follows the previous Rockville Facility Right-of-Way and would parallel the proposed Montrose Parkway along a portion of its path.

The alignment is proposed without predetermining the mode, but allowing for flexibility in future decision making. No specific recommendation about building the future service is made here, but it is recommended that the right-of-way be preserved for use should future demands warrant the service.

The transitway recommendations arise out of the Transportation Network Studies undertaken by the Planning Department. These studies prepared a conceptual network of transitways and HOV priority routes that would link many activity centers in Montgomery County with these services and also link Montgomery County with other portions of the region via transitways.

This transitway was not assumed to be in place during the life of this Master Plan and so this Plan does not provide local capacity for the network. It is an important link in a future regional network, centered on the Metrorail and MARC system. However, future availability of these links could benefit North Bethesda through improved ability to reach destinations quickly via transit and the reduction of through trips now made in automobiles. If demand should warrant building the transitway within the life of this Master Plan, that would be in keeping with the transit emphasis envisioned for this Plan.

This draft cannot definitively state the right-of-way standards needed, since this analysis has not yet been completed. More detailed recommendations will be presented during subsequent discussions with the Planning Board. The Shady Grove Master Plan did identify a 70-foot right-of-way for a similar future transitway.

5.8 RESULTS OF BICYCLE AND PEDESTRIAN ANALYSIS

Unlike the demand for road capacity, the demand for bicycle and pedestrian paths will only manifest itself once a safe, convenient, and well-connected system has been established. This section proposes the foundation for such a system. This Plan calls for the implementation of the Master Plan of Bikeways with the revisions and additions listed below. It also calls for an expanded system of sidewalks and increased safety for pedestrians. A listing of the bikeways plan can be found on Table 12. Refer to the Urban Design chapter of this Plan for a presentation of the details of pedestrian and bicycle-friendly design.

The following are proposed amendments to the Master Plan of Bikeways:

- Construct a bikeway along the WMATA tunnel right of way from the Grosvenor



station north to Twinbrook station. This connection will provide much needed access to the commercial and retail establishments along the corridor, to the three Metro stations and to the city of Rockville. The path would connect with the parallel Tuckerman-White Flint bikeway running along an abandoned trolley right-of-way west of Georgetown Preparatory School.

- Designate a new right-of-way linking Democracy Boulevard and Rock Spring Park with the residential area north of I-270 as far as Tuckerman Lane. An overpass spanning I-270 will be required to link these areas. This connection, which might be integrated into the design of the proposed interchange at Rock Spring Park, will enhance non-auto access to employment, Walter Johnson High School, and the future transitway envisaged between Grosvenor and Montgomery Mall.
- Include right-of-way for a bikeway in the easement for the North Bethesda Transitway, along Rock Spring Drive and Fernwood Road from Old Georgetown Road to Montgomery Mall. This bikeway will ultimately connect housing, shopping centers, offices, a high school, community center, and the proposed park on the Davis parcel at Rock Spring Park.
- Construct a bikeway between Veirs Mill Road and Fisher's Lane. A segment of this bikeway could use the alignment of Aspen Hill Road extended, which this Plan proposes to delete.
- Establish a bike route along Tilden Lane and another along Luxmanor Road. These will connect the many public facilities and residences in the area with the future Montrose Parkway, Tuckerman Lane, and the Tuckerman-White Flint pathway.
- Provide bike connections on either side of Rockville Pike at Edson Lane, Nicholson Lane and Executive Boulevard.
- Add bike lanes along Twinbrook Parkway, connecting Aspen Hill with Rockville and North Bethesda.
- Bike lanes are proposed for Nebel Street and Parklawn Drive to provide more alternatives for safe bike passage around the White Flint-Twinbrook area.
- Delete bikeway proposals for most of Old Georgetown Road, Montrose Road and Rockville Pike. High traffic volumes and little remaining right-of-way make it extremely difficult to create an environment that is conducive to bicycling along these roads. Safer, albeit less direct, alternative paths are available; they are detailed in Table 12 and Figure 59.
- Add bike lanes along Beach Drive from Knowles Avenue to Kensington.

- Delete the Master Plan of Bikeways trail between Tuckerman Lane and Rock Creek Trail via Weymouth Avenue. This trail, known as Trail Connector 2B, was officially deleted from the Rock Creek Stream Valley General Development Plan by the Park Commission in 1989. The deletion of this trail from the Master Plan of Bikeways would be consistent with this earlier action.

An extensive network of bikeways has been identified in the Montgomery County Bikeways Construction Program (1989) and the 1978 Master Plan of Bikeways. In addition, a bike action group assembled by the Montgomery County Department of Transportation provides up-to-date information on bikeway needs. Developer contributions to bikeway development should also play a significant role in bringing more trails to North Bethesda.

Projects which enhance access to Metrorail stations should be given first priority as they are usually less costly to implement and benefit commuters the most. In the residential areas, where slow-moving vehicles can coexist with bicycles, circulation can be enhanced through such cost effective measures as proper maintenance of residential streets and directional signs. All Class II and Class III bikeways should have signs warning motorists of shared use. Consideration for bike use must be carried through to the point of destination. Secure areas for bike parking, which are far less expensive to construct than parking for automobiles, could be incorporated into the design of any private or public lot or garage.

A. FUTURE SIDEWALK IMPROVEMENTS

Like bikeways, sidewalks should link community facilities, rail and bus stops, and centers of commercial and employment activity with adjacent neighborhoods. With a few exceptions, sidewalks are in place along most of the major streets in North Bethesda.

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The streets below, listed in order of priority, should be considered for sidewalk construction.

1. Tuckerman Lane west of Ralston Road (arterial)
2. Marcliff Road from Cushman Road to Tuckerman Lane (primary)
3. Farmland Drive south of Tilden Lane (primary)
4. Farmland Drive north of Racehorse Lane (primary)

B. PEDESTRIAN ENCOURAGEMENT ACTIONS

Pedestrian-activated walk signals and clearly marked crosswalks should be installed at every intersection with a traffic signal in office/commercial areas. Bus shelters should be put in place near all activity centers such as Walter Johnson High School. Attaching schedules to bus stops would be a simple way to ease bus use for bus patrons.

Separate pick-up/drop-off bays built near the entrance should be a part of any office or commercial site design. Such a provision would reduce walk time to a carpool and increase safety, thereby strengthening the effectiveness of the TDM measures advocated in this Plan.

TABLE 12

BIKEWAYS PLAN

Name	Location	Classification	Name	Location	Classification
EXISTING BIKEWAYS			PLANNED BIKEWAYS		
Rock Creek Park	Franklin Street - Veirs Mill Road	I	Aspen Hill Connector	Rock Creek Trail - Fishers Lane	I
Tuckerman - White Flint	Tuckerman Lane - Gulf Lane	I	Boiling Brook Parkway	Rock Creek Trail - Parklawn Drive	I
	Edson Lane - Nicholson Lane	I SW	Parklawn Drive	Boiling Brook Parkway - Nicholson Lane	II
East Jefferson Street	Montrose Road - Executive Boulevard	I SW	White Flint Connector	Nicholson Lane - Flanders Avenue via Orleans Way	I
Old Georgetown Road	Rockville Pike - Nebel Street	I SW	PROPOSED DELETIONS		
Schuykill Road	Schuykill Road - MARC Station	I	Old Georgetown Road	Montrose Road - Democracy Blvd. Cheshire Drive - Capital Beltway	Undesignated
Tuckerman Lane	Cabin John Park - Old Georgetown Road	II	Montrose Road	Montrose Parkway - Rockville Pike	I/II
	Old Georgetown Road - Montrose Avenue	I SW	Rockville Pike	Capital Beltway - Montrose Road	I
Randolph Hills Connector	Macon Road - Dahill Road	I	Rock Creek Connector	Tuckerman Lane - Rock Creek Trail	I
Strathmore Connector	Strathmore Avenue to Tuckerman Lane	I	BIKEWAYS RECOMMENDED IN THIS PLAN		
PLANNED BIKEWAYS			Old Georgetown Road	Democracy Boulevard - Cheshire Drive	III
Tuckerman - White Flint	Golf Lane - Edson Lane	I	Grosvenor - Twinbrook	Grosvenor - Twinbrook	I
Tuckerman - White Flint	Nicholson Lane - Marinelli Road	I	Tilden Lane	Hounds Way - Nicholson Lane	II
Beach Drive	Knowles Avenue - Kensington	I	Luxmanor Road	Tilden Lane - Tuckerman Lane	III
Strathmore	Rockville Pike - Weymouth Avenue via Strathmore Avenue	II	Nebel Street	Parklawn Drive - Randolph Road	I
Rockville Pike Alternate	Tilden Lane - Executive Boulevard	I	Executive Boulevard	Huif Court - Woodglen Drive	I
	Montgomery Road - Rollins Avenue via East Jefferson Street	I	Nicholson Lane	Old Georgetown Road - Nebel Street	III
Montrose Parkway	Montrose Road - Rock Creek Park	I	Twinbrook Parkway	City of Rockville - Veirs Mill Road	II
Montrose Road	Montrose Parkway - I-270	II	Parklawn Drive	Twinbrook Parkway - Bolling Brook Pky.	II
Randolph Road	Rockville Pike - Rock Creek Park	II	Fishers Lane	Aspen Hill Connector - Calvert Avenue	I
Tildenwood	Montrose Parkway - Tuckerman Lane	I / III	Edson Lane	Luxmanor Road - Rockville Pike via Polindexter Lane and Edson Lane	III
Fernwood	Capital Beltway - I-270	II / III	Rock Spring Park	Democracy Boulevard - Lux Lane	I
Rock Spring West Access	Old Georgetown Road - I-270 via Democracy Boulevard	I	Grosvenor Transitway	Montgomery Mall - Old Georgetown Road	I
Marinelli	Old Georgetown Road - Nebel Street via Wall Local Park	I/II	Greentree	Greentree Road - Fernwood Drive via Greyswood Road	III
Executive Boulevard	East Jefferson St. - Nicholson Lane	I / II			
Flanders Avenue	Rockville Pike - Strathmore Avenue	III			
North Bethesda - Bethesda	Tuckerman Lane - Capital Beltway via Strathmore Avenue	I / III			

SW = Sidewalk designed for bicycle and pedestrian use.

While there are sidewalks along most major roads, pedestrian use is sometimes discouraged by other factors. In many areas, site designs for office and commercial buildings inhibit pedestrian access since walkways are next to busy roads while the buildings are set back and widely dispersed. The road width, traffic speed, and volume of traffic traversing major roads in North Bethesda create hazardous conditions for pedestrians whether or not crosswalks exist. Until the right-of-way which pedestrians should enjoy at crossing points is vigorously enforced, they will often be too intimidated to consider walking all but the shortest distances. One additional means of redressing this problem would be to restrict free right-turn movements during the times of day when there is the greatest chance for conflicts between pedestrians and drivers, such as the noon hour.

In addition, amenities that make walking comfortable and inviting, such as trees and benches, are lacking. These conditions are particularly acute along Old Georgetown Road and Rockville Pike. This is in contrast with the considerable attention given pedestrian amenities around North Bethesda's Metrorail stations. Efforts should be made to carry forward the successes there into adjoining neighborhoods.