

Transportation Plan

This chapter makes recommendations regarding highways, mass transit systems, pedestrian connections, bikeways, and equestrian trails. The transportation system is one of the most important elements of the Plan. It is designed not only to address both regional and local transportation demand, but also to connect and integrate the various community activity areas. In addition, the transportation system is one of the major elements defining the visual image of Germantown.

A matter of concern during the Plan's preparation has been whether the Plan proposes a transportation system that can serve the end-state land use recommendations at an acceptable level of service (a measure of traffic congestion). To determine whether it could, the Montgomery County Planning Department staff has done an analysis of how well the end-state road and transit network would serve the end-state development pattern.

A description of the use of the computer model used in this analysis, with particular reference to Germantown, is contained in Appendix F. Transportation analyses were based on the land uses recommended by this Plan and the end-state transportation system. A detailed description of these analyses are included in the Appendix G; a related study on future travel characteristics in Germantown is contained in Appendix H.

The analysis concluded that, in order to achieve acceptable average levels of service, LOS C/D on the roadways and LOS E at selected intersections, limitations need to be placed on the extent of development in the Employment Corridor. Further, acceptable levels of service were predicted based on about 750,000 jobs County-wide, which included about 34,000 jobs and 22,500 dwelling units in Clarksburg.

This transportation network analysis assisted in establishing some of the land use and roadway recom-

mendations of this Plan. Based on this analysis, the allowable size of new buildings has been limited in certain employment areas in order to reduce the likelihood of excessive congestion. Further, based on projected traffic volumes, a roadway noise impact analysis was conducted. (See Figure 29.)

Objectives

The intent of this Plan is to ensure convenience, accessibility, and flexibility of the area's circulation system. It is designed to:

- Plan Germantown as a community with transit-serviceable land use.
- Develop a highway network in coordination with the existing regional network that provides convenient access throughout Germantown and to the regional highway system.
- Develop quality public transportation systems and improve private ridesharing and carpooling programs to reduce dependence upon single-occupancy automobile commuting.
- Support efficient and accessible public transit and carpool/vanpool programs, with particular emphasis on non-peak public transit service to meet needs of employment corridor employees during lunch time.
- Encourage the provision of bikeways for commuter as well as recreational uses.
- Encourage the coordinated and timely development of public and private pathways in concert with road construction and land development throughout Germantown.
- Encourage landscaping along the edge of the right-of-way and in medians.
- Provide, on selected roadways, medians at least 20 feet wide in order to plant trees in the

median even where left-turn lanes are provided.

- Limit the number of recommended lanes on selected major highways in order to enhance visual roadway quality, enhance pedestrian circulation and to discourage through-traffic in residential areas.

Close coordination among the various county and state agencies is necessary in order to assure the implementation of these objectives.

Character of Roadways

In addition to capacity issues, the physical design of roadways is an important element in this Plan. The Townscape Design chapter recommends the creation of a Streetscape Design Plan that focuses on the character of roadways to further establish a sense of identity. The major roadway design components are: the width of the right-of-way; the number of lanes; the provision of sidewalks and/or bikeways; the landscaping, lighting, street furniture, and signage; the transit amenities such as bus stops and shelters along the road edge; and, if appropriate, the landscaping of the medians.

The recommended roadway classifications and cross-sections are shown in Table 17 and Figure 30. The cross-section for roadways with right-of-way widths of 80 feet or more for each element of the roadway system was selected so that it would not only provide the needed traffic capacity but also provide landscaping and sidewalks/bikeways that would complement the adjacent land uses and improve the visual quality of Germantown. Because of the importance of providing landscaping within the rights-of-way and providing sidewalks and bikeways, the following objectives have been established:

- Providing landscaped medians and street trees.
- Planting all street trees along each roadway at the same time, whenever possible.
- Providing sidewalks and/or bikeways along both sides of roadways, bus stops, and shelters, where appropriate.
- Installing sidewalks, bikeways, and street trees, where lacking, on any major roadway which has been widened to its ultimate paving width.
- Constructing all roadways with curbs and gutters except in areas zoned RE-1.
- Widening rights-of-way at intersections to accommodate free right-turn lanes or double left-turn lanes, sidewalks, and bikeways, and landscaping. (See Figure 31.)

The recommended Montgomery County roadway cross-sections are based on the following accepted practices of MCDOT and MDSHA:

- A minimum 6-foot wide area is needed for planting street trees.
- Sidewalks are 5 feet wide.
- Bikeways are 8 feet wide.
- Street trees are to be planted 45 feet apart for shade trees; 30 feet apart for small flowering trees.

Unless otherwise noted, the above standards apply to all roadways contained in Table 17.

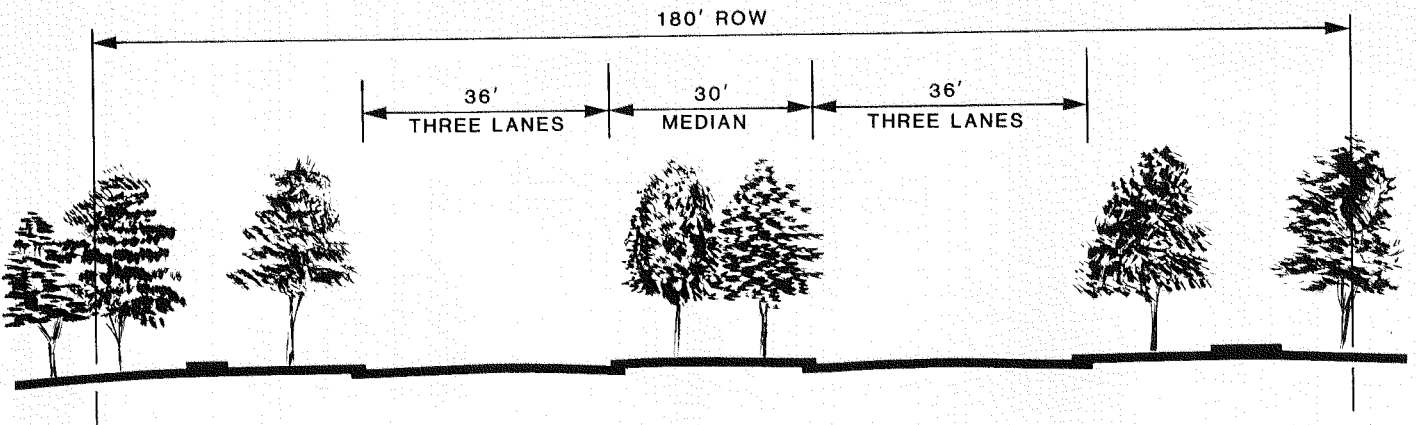
This Plan recommends that the right-of-way of an arterial road or major highway be widened at intersections with arterial and/or major highways. This increased width will provide space for an additional left turn lane and a right turn lane on the approach side of the intersection as well as an adjustment area on the departure side.

The amount of additional right-of-way on the approach side is 24 feet wide for 500 feet from the intersection with a 400-foot taper. On the departure side, the right-of-way is 12 feet wide for 200 feet with a 180-foot taper. (See Figure 31.) Both a divided arterial and a major highway with a 30-foot median can accommodate two left turn lanes; only 12 feet of additional right-of-way is needed in those cases. An undivided arterial road needs an additional eight feet of width to provide a median at the intersection for pedestrian and vehicular safety. The dimensions of intersection rights-of-way are shown on Figure 31.

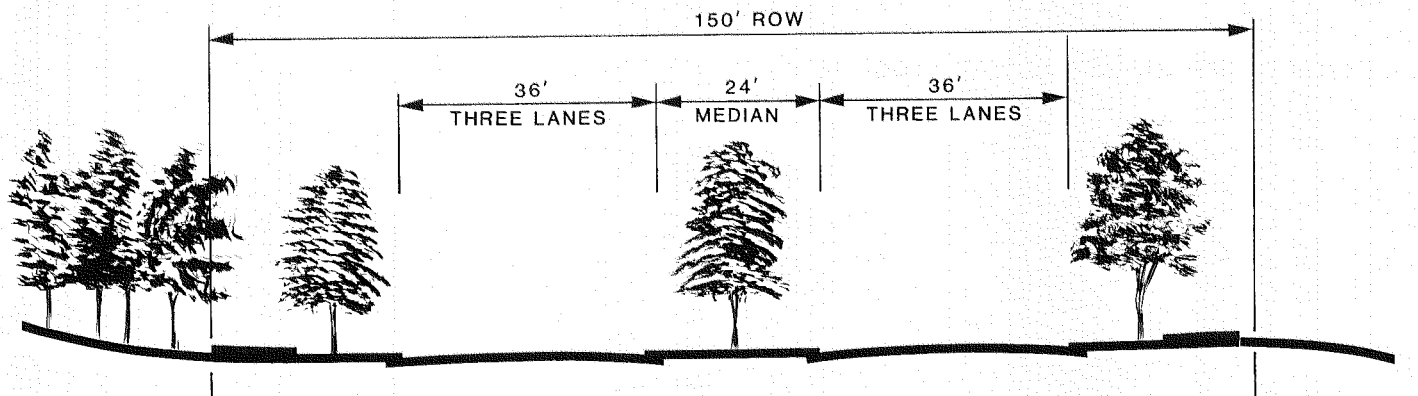
One of the limiting factors of traffic capacity occurs at the intersections. The wider right-of-way recommended here will enable additional turning movements to be added in the future without negatively affecting adjacent private property or the continuity of pedestrian/bikeway movement.

Also included in Table 17 are recommendations for the "greening" of selected roads in order to create a parkway image. These roads are Midcounty Highway, Great Seneca Highway, and the portion of Clopper Road from Seneca State Park north to Great Seneca Highway. Each of these roads crosses or parallels extensive portions of the greenbelt parks. Goldenrod Lane is also recommended for extensive landscaping as it is the edge between the Employment Corridor and Neelsville Village.

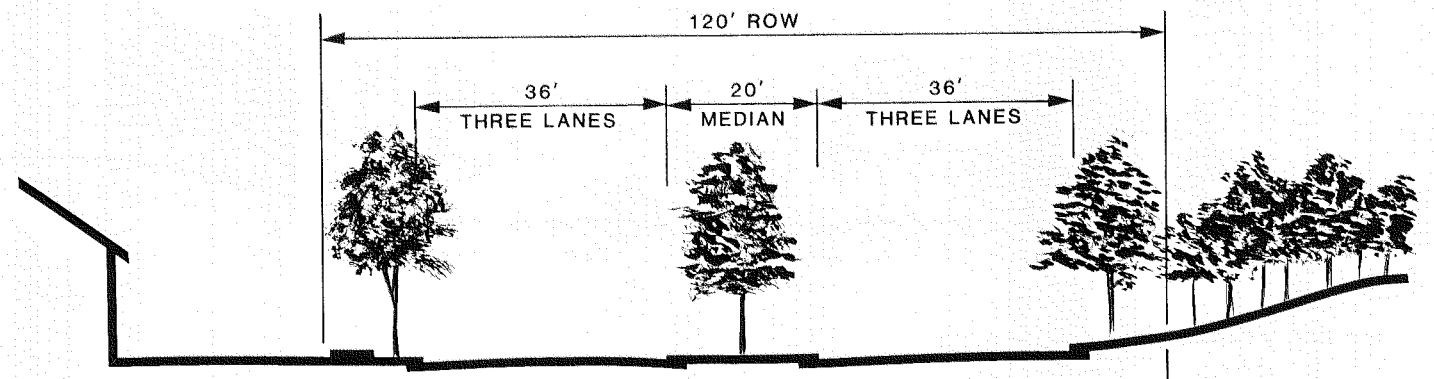
Street trees and landscaped medians, where appropriate, are recommended for major and arterial roads. These landscaped areas reduce the visual impact of multi-lane roadways as they pass through the community. In some instances, sound attenuation devices such as berms will be recommended as a result of a roadway noise study for situations where on-site noise mitigation measures are not practical.



MAJOR HIGHWAY (180' ROW)



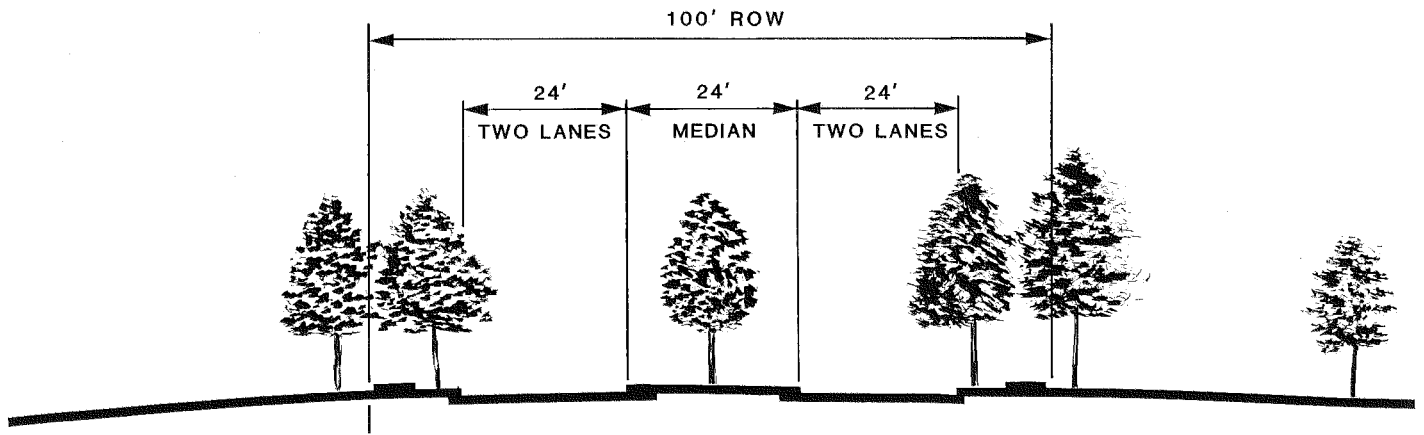
MAJOR HIGHWAY (150' ROW)



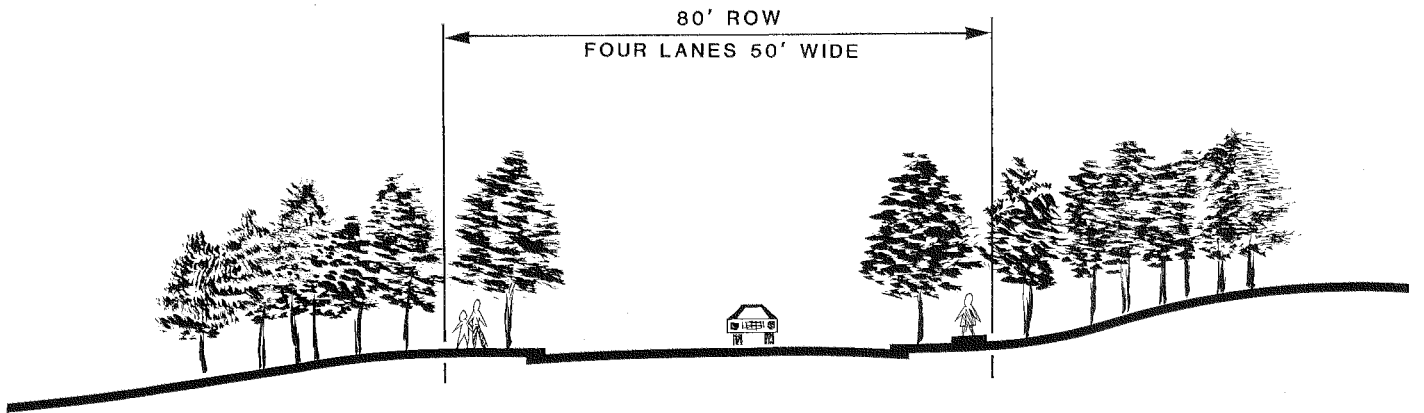
MAJOR HIGHWAY (120' ROW)

Roadway Cross Sections

Figure 30



DIVIDED ARTERIAL ROADWAY (100' ROW)



ARTERIAL ROADWAY (80' ROW)

Roadway Cross Sections



Comprehensive Amendment
to the Master Plan for Germantown

Montgomery County, Maryland

The Maryland-National Capital Park and Planning Commission

TABLE 17
ROADWAY CLASSIFICATIONS

Roadway Number	Route Number	Name	Limits	Minimum Right-of-Way Width	Recommended Number of Lanes	Other Recommendation
F-1	I-270	Washington National Pike	Planning Area Northern Boundary to Planning Area Southern Boundary	300'	8	<ul style="list-style-type: none"> In addition, collector-distributor roads should be extended from Gaithersburg through to Clarksburg
M-6	MD 355	Frederick Road	A Planning Area Northern Boundary to MD 118 relocated (M-61)	150'	6	<ul style="list-style-type: none"> Provide 24-foot wide median Emphasize landscaping of edges Landscapes median Provide bike path on west side, sidewalk on the east side Construct interchange at Ridge Road (M-27)
			B MD 118 Relocated (M-61) to Planning Area Southern Boundary	150'	6	<ul style="list-style-type: none"> Provide 24-foot wide median Emphasize landscaping of edges Landscapes median Provide sidewalks on both sides When the subdivision for village center is approved, additional right-of-way may need to be dedicated to provide space for addition of turn lanes and the continuation of sidewalk and street trees
M-26	MD 117	Clopper Road	A Planning Area Northern Boundary to MD 118 Relocated (M-61)	150'	6	<ul style="list-style-type: none"> Construct as open section roadway Provide 24-foot wide, closed section, median Landscapes median Provide bike path on west side, sidewalk on the east side south of Hopkins Road (A-80)
			B MD 118 Relocated (M-61) to Great Seneca Highway (M-90)	150'	6	<ul style="list-style-type: none"> Provide 24-foot wide median Plant trees in median Plant street trees on both sides Provide bike path on west side, sidewalk on the east side Construct interchange at Great Seneca Highway (M-90)
			C Great Seneca Hwy. (M-90) to Planning Area Southern Boundary	120'-150'	6	<ul style="list-style-type: none"> Provide 24-foot wide median Create parkway quality by providing extensive land informal landscaping of native plant material on edges and median Provide bike path on south side Provide sidewalk on north side between Great Seneca Highway and Allspice Drive

TABLE 17 (Cont'd.)

Roadway Number	Route Number	Name	Limits	Minimum Right-of-Way Width	Recommended Number of Lanes	Other Recommendations
M-27	MD 27	Father Hurley Boulevard	A MD 118 Relocated (M-61) to Crystal Rock Drive (M-84)	120'	6	<ul style="list-style-type: none"> Provide 24-foot wide median Emphasize landscaping of edges Landscaped median Provide sidewalks on both sides
		Father Hurley Boulevard/Ridge Road	B Crystal Rock Drive (M-84) to Planning Area Eastern Boundary	150'	6	<ul style="list-style-type: none"> Provide a 24-foot wide median Provide special landscaping treatment along edge of Village Center Provide sidewalks on both sides Construct interchanges at Observation Drive (A-19) and MD 355 (M-6)
M-61	MD 118	Germanstown - Darnestown Road	A Planning Area Western Boundary to Clopper Road (M-26)	120'	6	<ul style="list-style-type: none"> Provide 24-foot wide median Landscaped median with trees Plant street trees on both sides Provide bike path on north side and sidewalks on the south side When the subdivision for village center is approved, additional right-of-way may need to be dedicated to provide space for the addition of turn lanes and the continuation of sidewalk and street trees
			B Clopper Road (M-26) to Aircraft Drive (B-7) and east side ramps of I-270 (F-1) to MD 355 (M-6)	150'	6	<ul style="list-style-type: none"> Provide 24-foot wide median
			C MD 355 (M-6) to Midcounty Highway (M-83)	150'	6	<ul style="list-style-type: none"> Provide 24-foot wide median Landscaped median with trees Plant street trees on both sides Provide berms along existing residential areas to provide a visual and acoustic barrier Provide bike path on south side and sidewalk on north side Construct interchange at Midcounty Highway (M-83)
M-83	MD 115	Midcounty Highway	Planning Area Northern Boundary to Planning Area Southern Boundary	150'	6	<ul style="list-style-type: none"> Provide 24-foot wide median Create parkway quality Landscaped median and edges with native plant material in an informal design Provide bike path on west side Construct interchange at MD 118 (M-61)

TABLE 17 (Cont'd.)

Roadway Number	Route Number	Name	Limits	Minimum Right-of-Way Width	Recommended Number of Lanes	Other Recommendations
M-84	—	Crystal Rock Dr.	Father Hurley Blvd. (M-27) to MD 118 (M-61)	120'	6	<ul style="list-style-type: none"> • Provide 24-foot wide median • Landscape median with trees • Plant street trees on both sides • Provide bike path on west side and sidewalk on east side
M-85	—	Middlebrook Rd.	A Father Hurley Blvd. (M-27) to MD 118 (M-61)	120'	6	<ul style="list-style-type: none"> • Provide 24-foot wide median • Landscape median with trees • Maintain street trees on both sides • Provide sidewalks on both sides
			B MD 118 (M-61) to MD 355 (M-6)	150'	6	<ul style="list-style-type: none"> • Provide 24-foot wide median • Landscape median with trees • Provide street trees on both sides • Provide bike path on the south side and sidewalk on the north side.
			C MD 355 (M-6) to Midcounty Highway (M-83)	150'	6	<ul style="list-style-type: none"> • Provide 24-foot wide median • Landscape median with trees • Provide street trees on both sides • Provide bike path on the south side and sidewalk on the north side
M-90	—	Great Seneca Highway	Middlebrook Road (M-85) to Planning Area Southern Boundary	120'	6	<ul style="list-style-type: none"> • Create parkway quality by providing extensive and informal landscaping of native plant material on edges and median • Provide bike path on the west side and sidewalk on the east side • Construct interchange at MD 117 (M-26)
A-17		Watkins Mill Road	Midcounty Highway (M-83) to Planning Area Eastern Boundary	80'	4	<ul style="list-style-type: none"> • Provide bike path on south side when widen to four lanes
A-19		Observation Dr.	Planning Area Northern Boundary to MD 118 (M-61)	100'	4	<ul style="list-style-type: none"> • Construct interchange at Ridge Road (M-27) • Construct as divided arterial with landscaped median • Plant street trees on both sides • Provide sidewalks on both sides
A-20		Germantown Rd. (Existing MD 118)	Sunnyview Drive to MD 355 (M-6)	80'	4	<ul style="list-style-type: none"> • Add sidewalks to both sides when widen to four lanes

TABLE 17 (Cont'd.)

Roadway Number	Route Number	Name	Limits	Minimum Right-of-Way Width	Recommended Number of Lanes	Other Recommendations
A-21	A	Scenery Drive	MD 118 Extended (M-61) to Middlebrook Road Extended (M-85)	80'	4	
	B	Scenery Drive	Middlebrook Road Extended (M-85) to MD 355 (M-6)	100'	4	• Provide double row of street trees on both sides
	C	Gunnors Branch Road	MD 355 (M-6) at Scenery Drive to MD 355 (M-6) approximately 1100 feet to the north	80'	4	
A-22		Crystal Rock Dr.	Father Hurley Boulevard (M-27) north to Park Access Road	100'	4	• Plant street trees on both sides • Provide sidewalk on east side and bike path on the west side
A-74		Wisteria Drive/Waring Station Rd.	Crystal Rock Drive (B-1) to Middlebrook Rd. (M-85)	80'	4	
A-80		Hopkins Road	Clopper Road (M-26) to Father Hurley Boulevard (M-27)	80'	4	• Provide sidewalks on both sides • Plant street trees on both sides
A-103		Riffle Ford Road	MD 118 (M-61) to Planning Area Southern Boundary	80'	2	
A-254	A	New Road	Father Hurley Boulevard (M-27) to Germantown Road (Existing MD 118)	80'	4	• Provide sidewalks on both sides • Plant street trees on both sides
	B	New Road	Germantown Road (Existing MD 118) to Great Seneca Highway (M-90)	100'	4	• Construct as divided arterial with landscaped median • Plant street trees on both sides
A-270		New Road	Hoyles Mill Road (A-298) to Clopper Road (M-26)	100'	4	• Construct as divided arterial with landscaped median and street trees on both sides
A-271		Dairymaid Drive	Great Seneca Highway (M-90) to Mataney Road (A-290)	80'	4	• The connection to Great Seneca Highway may be restricted depending upon the ultimate design of the Clopper Road/Great Seneca Highway interchange.

TABLE 17 (Cont'd.)

Roadway Number	Route Number	Name	Limits	Minimum Right-of-Way Width	Recommended Number of Lanes	Other Recommendations
A-273		Ridge Road	MD 355 (M-6) to relocated Ridge Road (M-27)	100'	4	<ul style="list-style-type: none"> Construct as divided arterial with landscaped median Provide sidewalks on both sides
A-289		Waring Station Road	Clopper Road (M-26) to Wisteria Drive (A-74)	80'	4	<ul style="list-style-type: none"> Provide bike path on the west side
A-290		A Mateney Road	Great Seneca Highway (M-90) northeast to Dairymaid Drive (A-271)	100'	2 and 4	<ul style="list-style-type: none"> Construct as divided arterial with landscaped median and street trees on both sides Provide sidewalks on both sides
		B Mateney Road	Dairymaid Drive (A-271) north to Great Seneca Highway (M-90)	80'	2	<ul style="list-style-type: none"> Provide sidewalks and street trees on both sides
A-291		A Shakespeare Drive	Observation Drive (A-19) to MD 355 (M-6)	100'	4	<ul style="list-style-type: none"> Construct as divided arterial with landscaped median and street trees on both sides Provide sidewalks on both sides
		B Shakespeare Drive	MD 355 (M-6) to MD 118 Extended (M-61)	80'	4	<ul style="list-style-type: none"> Provide sidewalks and street trees on both sides
A-297		A New Road	Clopper Road (M-26) southwest to MD 118 (M-61)	100'	4	<ul style="list-style-type: none"> Construct as divided arterial with landscaped median Provide sidewalks on both sides Plant double row of street trees on both sides See Land Use Plan - Analysis Area KI-2
		B New Road	MD 118 (M-61) southeast to Great Seneca Highway (M-90)	100'	4	<ul style="list-style-type: none"> Construct as divided arterial with landscaped median and street trees on both sides Provide sidewalks on both sides
A-298		A Hoyles Mill Road	New Road (A-297) to MD 118 (M-61)	100'	4	<ul style="list-style-type: none"> Construct as divided arterial with landscaped median Provide sidewalks on both sides Plant double row of street trees on both sides Construct two lanes on one side and a bikeway on the other until traffic warrants additional lanes See Land Use Plan - Analysis Area KI-2
		B Hoyles Mill Road	MD 118 (M-61) to Great Seneca Highway (M-90)	100'	4	<ul style="list-style-type: none"> Construct as divided arterial with landscaped median and street trees on both sides Provide sidewalks on both sides

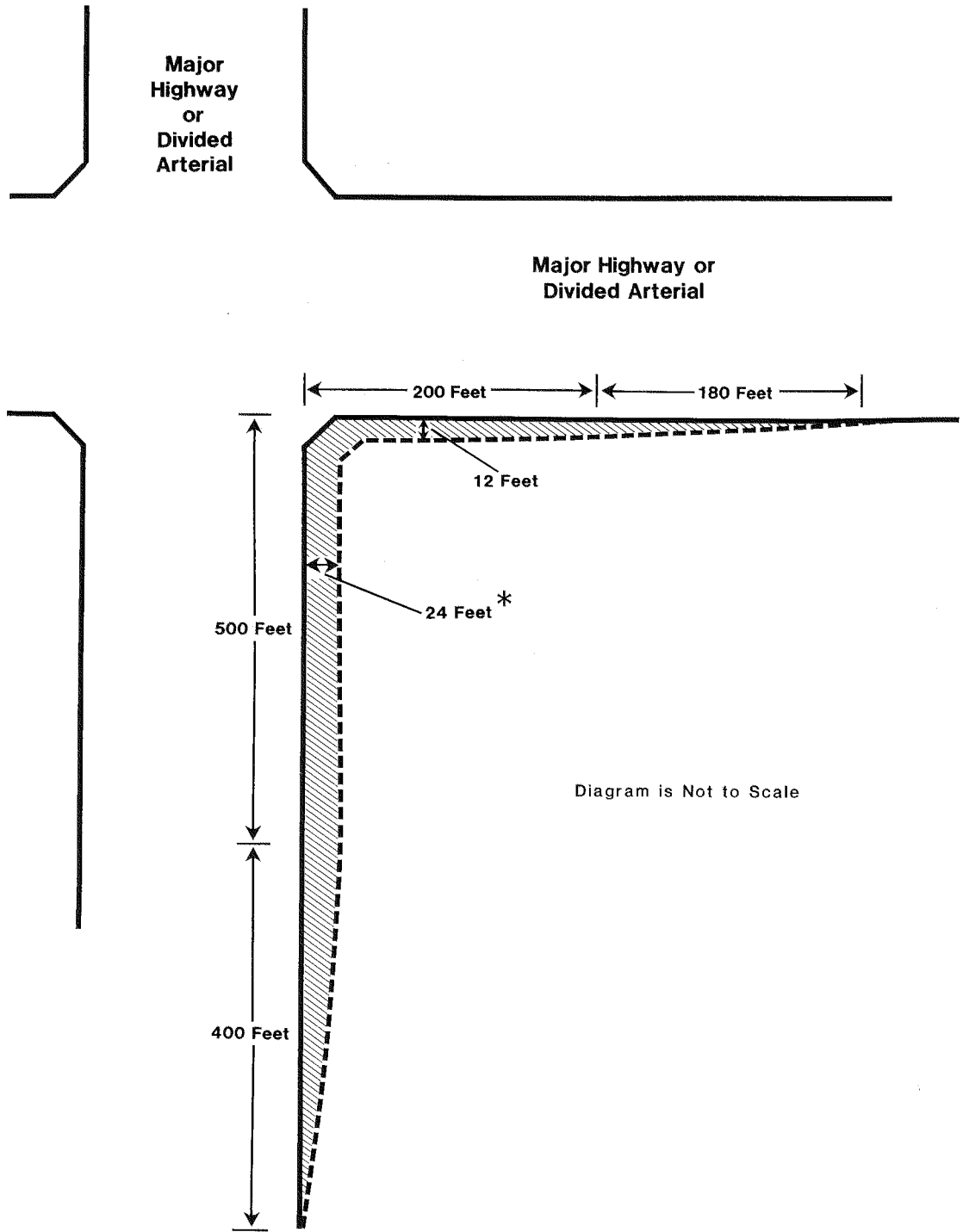
TABLE 17 (Cont'd.)

Roadway Number	Route Number	Name	Limits	Minimum Right-of-Way Width	Recommended Number of Lanes	Other Recommendations	
A-299		Waters Landing Drive	Crystal Rock Drive (A-22) to Century Boulevard (I-1)	100'	4	<ul style="list-style-type: none"> Construct as divided arterial with landscaped median and street trees on both sides Provide sidewalks on both sides 	
B-1		Crystal Rock Drive	Wisteria Drive (B-2/A-74) to Middlebrook Road (M-85)	80'	4		
B-2		Wisteria Drive	Father Hurley Boulevard (M-27) to Crystal Rock Dr. (B-1)	80'	4		
B-3	A	Walter Johnson Drive	Wisteria Drive to end, approximately 750 feet southwest of Wisteria Drive	100' and 50'	4 and 2	<ul style="list-style-type: none"> Construct a one-way, 2-lane loop road with a 26 foot pavement width connected to Wisteria Drive by a two-way, 4-lane divided roadway Provide sidewalks on both sides Plant street trees on both sides 	
	B	Walter Johnson Drive	Wisteria Drive, to end, approximately 750 feet northeast of Wisteria Drive (B-2)	80'	4	<ul style="list-style-type: none"> Provide sidewalks on both sides when widen to four lanes or construct new portions Plant street trees on both sides 	
B-4		Deleted from Master Plan by Amendment approved and adopted in 1980					
B-5		Locbury Drive	Middlebrook Road (M-85) to 1,000 feet south of Wisteria Drive (B-2)	80'	4	<ul style="list-style-type: none"> Provide sidewalk on both sides 	
B-6		Crystal Rock Drive	MD 118 (M-61) to 400 feet south of MD 118 (M-61)	80'	4		
B-7		Aircraft Drive	MD 118 (M-61) to Century Blvd. (I-1)	80'	4	<ul style="list-style-type: none"> Provide sidewalks on both sides when wide to four lanes Plant street trees on both sides 	
B-8		Blunt Road	Middlebrook Road, to cul-de-sac 300 feet south	80'	4	<ul style="list-style-type: none"> Provide sidewalks on both sides Plant street trees on both sides 	

TABLE 17 (Cont'd.)

Roadway Number	Route Number	Name	Limits	Minimum Right-of-Way Width	Recommended Number of Lanes	Other Recommendations
I-1	A	Crystal Rock Drive	Park Access Road to New Road (I-4)	100'	4	<ul style="list-style-type: none"> Construct as divided arterial with landscaped median and street trees on both sides Provide bikepath on the west side and sidewalk on the east side
	B	Century Boulevard	New Road (I-4) to Waters Landing Drive (I-2)	100'	4	<ul style="list-style-type: none"> Construct as divided arterial with landscaped median and street trees on both sides Flexibility should be provided in the width of right-of-way (to an 80-foot minimum) and in the width of the median (to its elimination) particularly where the roadway passes under Father Hurley, across wetlands and at intersection Provide bikepath on the west side and sidewalk on the east side
	C	Century Blvd.	Waters Landing Drive (I-2) to Crystal Rock Drive (M-84)	80'	4	<ul style="list-style-type: none"> Add street trees and sidewalks to both sides of constructed segment and provide the same along extension
I-2		Waters Landing Drive	Crystal Rock Drive (M-84) to Century Blvd. (I-1)	100'	4	<ul style="list-style-type: none"> Construct as a divided arterial with landscaped median and street trees on both sides Provide sidewalks on both sides
I-3	A	Goldenrod Lane	MD 118 (M-61) to end, approximately 1,000 feet north of MD 118	100'	4	<ul style="list-style-type: none"> Construct as a divided arterial with landscaped median and street trees on both sides Provide sidewalks on both sides
	B	Goldenrod Lane	MD 118 (M-61) to end, approximately 1,000 feet south of MD 118	80'	4	<ul style="list-style-type: none"> Construct sidewalk only on north side Preserve existing trees within right-of-way on south side
I-4		New Road	Crystal Rock Drive/ Century Blvd. (I-1) to Observation Drive (A-19)	100'	4	<ul style="list-style-type: none"> Construct as divided arterial with landscaped median and street trees on both sides Provide sidewalks on both sides
I-5		Aircraft Drive	Century Boulevard (I-1) to Crystal Rock Drive (M-84)	100'	4	<ul style="list-style-type: none"> Construct as divided arterial with landscaped median and street trees on both sides Provide sidewalks on both sides

Figure 31



Intersection Rights-of-Way

Additional Right-of-Way to accommodate turn lanes



12 feet for major highways planned for 30 foot medians and for divided arterials.



Comprehensive Amendment
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Montgomery County, Maryland

The Maryland-National Capital Park and Planning Commission

Where roadways cross stream valleys and other environmentally sensitive areas such as those shown on Figure 26, there are opportunities to create open space vistas. These are also locations where extreme care must be taken to reduce the impact of road construction on these sensitive areas.

It has become increasingly apparent that the specifications in the 1974 *Master Plan* for four-lane arterials and larger roadways do not allow enough space within the right-of-way for visual and acoustic buffers, landscaped areas, stormwater management facilities, or for environmentally sensitive roadway design and alignment. A prime example is the section of MD 118 west of the B&O Railroad tracks, where the setbacks are inadequate and the right-of-way provides only minimal space to accommodate noise mitigation structures. To remedy this situation, the following guidelines are recommended when appropriate:

- On all preliminary plans of subdivision for new residential development, where right-of-way widths and alignments have been substantially determined through dedications, a roadway compatibility buffer should be provided. This buffer would be on private property at approximately 40 feet in width adjacent to the right-of-way. This area will be treated as open space and will be set aside for the purpose of providing visual, vegetative and/or physical barriers (such as berms and fences) to roadway nuisances, as well as slope easements needed for the grading of the roadway.
- In areas where dedications have not been substantially committed in terms of right-of-way widths, the following widths are recommended as the minimum by this Plan:

major highway	150 feet
divided arterial	100 feet

Specific recommendations on minimum right-of-way widths are shown in Table 17.

Since roadway character is important to the implementation of this Plan, it is imperative that the Montgomery County Planning Department staff review and comment on the design and engineering of major roadways, whether they are funded by public or private funds, to insure compliance with the Plan's objectives and guidelines. The Montgomery County Planning Board, under its mandatory referral authority, will review these projects at appropriate phases during design and engineering.

Further, this Plan recommends that on selected major highways the number of lanes be limited in order to discourage through traffic in residential areas, facilitate pedestrian circulation, and enhance visual roadway quality.

Transportation Analysis

An issue of great concern focuses on whether the Master Plan's end-state land use recommendations can be adequately served by the recommended transportation system of the Master Plan.

The following discussion presents the results of the transportation analysis of the Land Use Plan with respect to the effect on areawide and local congestion levels. The conclusions of the transportation analysis are presented first, followed by discussion of the findings with respect to a) the areawide analysis, and b) local area intersection analysis. It should be noted that this analysis is the first application of the Planning Board's computerized transportation model to the transportation analysis of an area master plan. Readers are referred to Appendix F for a discussion on the use of transportation models in particular, and specifically how this tool has been applied to the analysis for the Germantown Master Plan.

CONCLUSIONS

- A proposed end-state land use intensity, limited to a maximum 0.5 floor area ratio (FAR) for Analysis Areas in the Germantown Employment Corridor and a lower limit in some Analysis Areas, appears to be supportable by the proposed end-state transportation system that also accounts for estimates of through traffic and transit use. This recommended employment density of this Plan would yield approximately 59,000 employees in the Germantown Employment Corridor and a planning areawide total of about 78,000 employees for Germantown.
- End-state residential development of approximately 37,000 housing units in the Germantown Planning Area is recommended by this Plan. Approximately 3,800 of these units are proposed in the East and West Urban Village areas of the Germantown Employment Corridor. This level of residential development in Germantown would also be supported by the proposed end-state transportation system.
- It is recommended that the standard for an acceptable level of congestion for the Germantown Planning Area be set at an average level of service C/D. This corresponds to a Group III standard in the system adopted by the County Council in the Annual Growth Policy process. An areawide average level of service C/D would result under the recommended end-state land use/transportation scenario.

- Local intersections within the Germantown Employment Corridor would function at acceptable level of service (better than mid-point of LOS E), given the recommended end-state land use densities and transportation system. It should be noted, however, that some major intersections outside the Employment Corridor but within the Germantown Planning Area are projected to operate at unacceptable levels of service. These intersections are located along the MD 117 and MD 355 travel corridors. Through traffic from outside the Germantown area appears to be the major contributor to the traffic volumes at these locations.
- A fourth I-270 interchange, north of M-27, is not recommended as an element of the Germantown Master Plan, based on Planning Department staff analysis. There are three reasons for this recommendation: it is not feasible to implement a new interchange at that location; the contemplated arterial master planned network of arterials is projected to provide sufficient site access to the adjacent property; and the proposal would create significant negative impacts on adjacent land uses.
- No methodology for explicitly forecasting transit use has been applied in the transportation analysis so far. Instead, transit use levels between areas have been estimated that implicitly assume the active use of the transit easement beyond Shady Grove to Clarksburg, with service on its own right-of-way. Thus, it is assumed that the availability of transit service within the Germantown Planning Areas would be sufficient to warrant a Group III (average areawide LOS C/D standard) classification as outlined in the Annual Growth Policy. This reflects moderate transit availability similar to current transit service in areas such as Gaithersburg or Fairland/White Oak. Despite the uncertainty of the final alignment of the transit easement, coupled with the uncertainty of the precise nature of the service along its right-of-way, these implicit assumptions of transit use, and their impact on estimated congestion levels, appear reasonable.

SUMMARY

The transportation analysis for the Germantown Master Plan Amendment was carried out at two basic levels of detail: (a) an areawide analysis of the average congestion levels in Germantown; and (b) a local analysis of the expected congestion at a selected set of intersections in the vicinity of the major employment locations. The transportation analysis done for the Preliminary Draft Plan was refined several times during

the Board's worksessions to account for changes in the location, mix, and intensity of the land use, and modifications to the planned transportation system. That overall transportation analysis is given in Appendix H. The summary results are given here.

Areawide Analysis

In order to assess future average congestion levels for the Germantown Planning Area, an approach was used that is comparable to that of the Annual Growth Policy to set Annual Staging Ceilings. This approach involves: (a) a regional transportation model, with extra detail in Germantown and adjoining areas; (b) setting a standard of an acceptable average level of congestion; and (c) a comparison of average congestion levels resulting from the proposed land use plan against the standard of acceptable congestion.

Regional Context of the Analysis:

Today, as well as in the future, traffic and congestion levels in the Germantown area depend on many things. Among them are the location, mix and intensity of local development and transportation facilities within the area. It is also recognized that development levels and transportation facilities in the larger region beyond the Germantown area also play a major role in the levels of traffic and congestion within Germantown. Therefore, in order to assess future congestion levels in Germantown, techniques that account for these larger, regional traffic patterns are needed. With that in mind, staff has adapted the regional transportation modeling system being used in the Countywide Annual Growth Policy for use in the areawide analysis of the proposed land uses within the Germantown area. While details of the modeling are given in Appendix F, it is helpful to identify here some of the regional context in which the model has been applied in this analysis.

In order to analyze the end-state development for the Germantown Planning Area, it is necessary to use comparable land use activity and master planned transportation facilities throughout the County and the greater Washington region. To do otherwise would result in travel patterns and traffic flows that would not be representative of Germantown's relative location in the larger region. As such, the analysis framework being used in the work on the assessment of the *General Plan* was adapted for use in this analysis. The *General Plan* assessment has been using a time horizon of approximately fifty years to represent end-state development. That time frame includes a build-out of the Master Plan of Highways network, as well as Countywide land activity based upon the cumulative zoning holding capacities of all of the current master plans.

The number of households that would result Countywide from the cumulative zoning in the

TABLE 18: CORRESPONDENCE BETWEEN TRANSIT AVAILABILITY AND AVERAGE LEVEL OF SERVICE STANDARDS

Average Level of Service Standards	Public Transport Alternatives Group Classifications	Transit Services Available or Programmed				
		Auto Dependent and/or System	Bus Based Systems	and/or Fixed Guideway Systems		
		Park/Ride Access	Community and Local Bus Service	Regional Park/Ride Express Bus and High Occupancy Vehicle Priority Systems	Commuter Rail or Light Rail	Metrorail
* I	Marginal	Marginal access to stations or bus routes outside of the area	Not available	Not available	Marginal amount of the area is within walking distance	Not Available
		Limited number of park/ride spaces	Limited coverage and frequency	Limited park/ride spaces or lots with local bus service	Limited park/ride access and walking access	Park/ride and kiss/ride access limited to nearby stations outside of the area
C/D	Moderate	Moderate number of park/ride spaces, limited kiss/ride service	Moderate coverage, limited to policy frequencies	Moderate express bus service in conjunction with a system of park/ride lots	Moderate parking or walking access with system transfers	Moderate station coverage in the area with associated feeder access
		Moderate park/ride spaces and moderate kiss/ride service	Moderate coverage, combined policy and frequent demand-based service	Priority treatment for frequent express buses, local circulation feeder services in conjunction with a system of park/ride lots	Same as Group III above	More dense spacing of stations and bus routes
D/E	Full	Limited park/ride with full reliance on kiss/ride access	Full area coverage and a large number of routes with frequencies based on demand	Same as Group IV above	Same as Group III above	Full frequency and full reliance on kiss/ride, easier walking and bicycle access
		Expanded park/ride with reliance on kiss/ride access	Expanded bus frequencies; 100 buses in PM peak	Same as Group IV above	Same as Group III above	Designated CBD; controlled parking; Transportation Mgmt District

* See Text of the Recommended FY 90 AGP for Methods and Standard of Measuring Traffic.

Source: Montgomery County Planning Department.

master plans is a rather firm number, about 440,000 households. However, the number of jobs that could result from the cumulative non-residential zoning is a lot less certain. This is due to the way in which many of the commercial, office, and industrial zones are defined. They do not specifically limit the density, in terms of floor area ratio (FAR), to which a particular parcel can develop. One estimate, using a 0.8 FAR assumption, would result in as many as 1.5 million jobs Countywide. That would be a nearly four-fold increase over the approximate 0.4 million current jobs in the County. The transportation analysis for the Germantown Planning Area has used a reduced Countywide job total of about 0.75 million jobs. Most of the difference between the two employment estimates occurs in the Corridor Cities of Gaithersburg, Germantown, and Clarksburg. The effect of through trips on Germantown should be considered further in the analysis for the Comprehensive Growth Policy Study scenarios and the Gaithersburg Vicinity Master Plan Amendment Stage III (Shady Grove Study Area) update.

Standard of Acceptable Congestion:

The FY 90 Annual Growth Policy (AGP) has identified the Germantown Planning Area as one that currently has limited transit service available. That defines the area as a Group II area. The AGP sets the policy that a Group II area has an Average Level of Service Standard of LOS C for congestion. This transportation analysis recommends that the appropriate standard of acceptable congestion, for the time frame of the Germantown Master Plan, should be a Group III area with an Average Level of Service C/D Standard.

Table 18 is the same as the one used in the FY 90 AGP to show the correspondence between transit availability and Average Level of Service Standards. It is expected that the nature of the transit service that will be provided using the Corridor Cities Transit Easement, whether it is a bus-based system or fixed guideway system, would have moderate coverage and service frequencies, a moderate number of parking spaces, some areas accessible by walking, and moderate levels of feeder bus services. It is on this basis that the Germantown area should be considered a Group III area for the time frame of the master plan build-out.

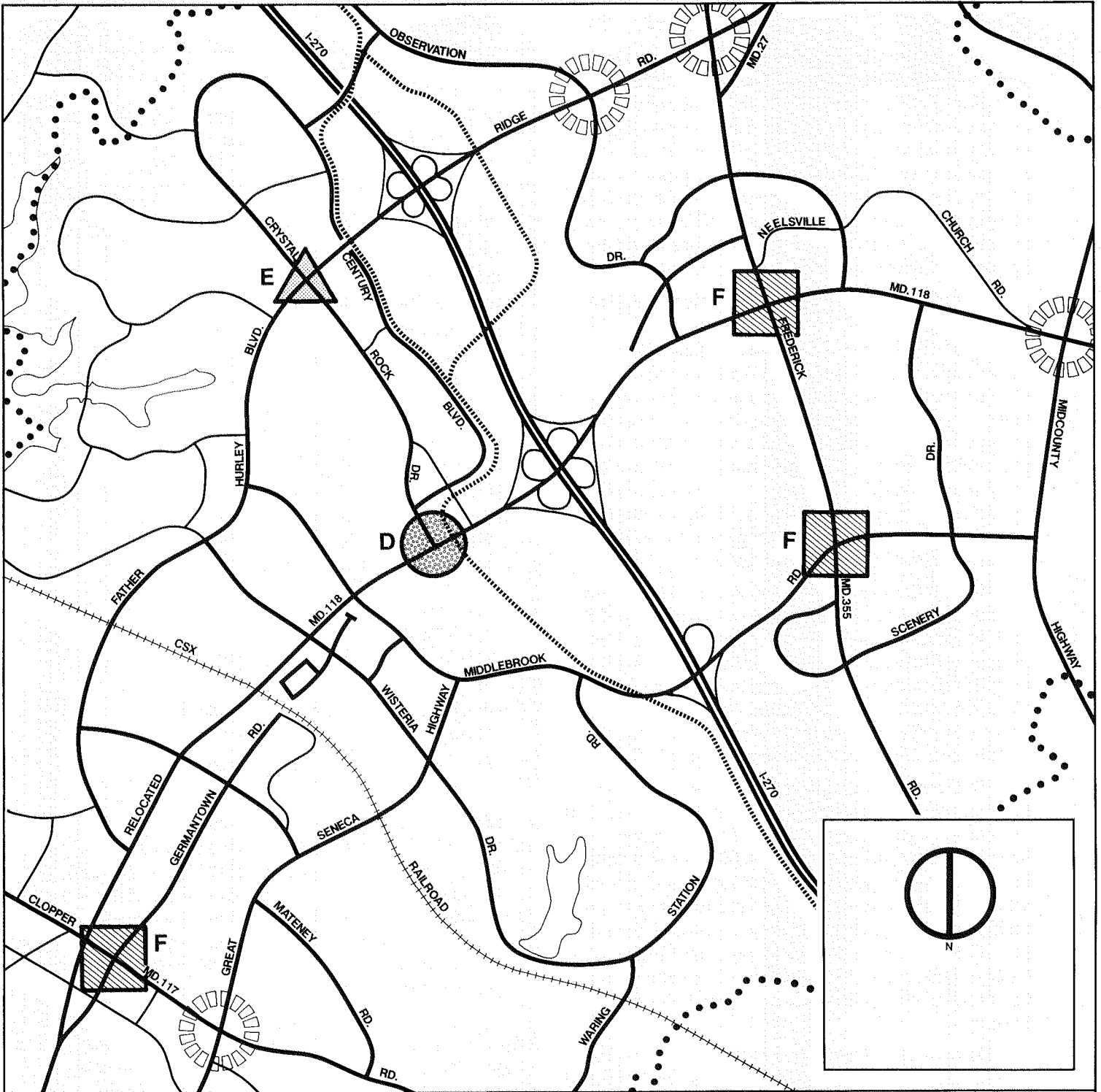
There are several other reasons why Germantown should be considered a Group III area, with a standard of an average LOS C/D, at build-out. The basic reason for this classification is that it is expected that the transit service on the Transit Easement will not serve Germantown to the same extent that Metrorail currently serves an area such as North Bethesda. Transit usage to employment in Germantown and

from residences in Germantown is not projected at this time to be as high as that of North Bethesda, for example. This is due, in part, to the locations of projected work places of Germantown residents and the projected resident locations of Germantown's future work force. (See Figure H-2.) As can be seen, about 25 to 30 percent of Germantown's future work force is projected to come from areas that could be served directly by the Transit Easement and about 50 percent of Germantown's employed residents would work in areas directly served by the Transit Easement. While transit service on the Easement could capture some significant percentages of these trip interchanges, the overall effect on total transit use is expected to be moderate. Further study related to the Transit Easement and to the Comprehensive Growth Policy may provide information that would revise these conclusions.

Another reason for a possible lower public transit use percentage relative to the North Bethesda area is lower than the expected need to transfer from the Transit Easement to Metrorail at the Shady Grove Metrorail station. The projected extra travel time and inconvenience to make this change, given the current design of the Shady Grove station, will be a disincentive to the use of this combination of services. It may be possible, however, to plan for and design a more effective integration of transit services than currently envisaged.

Although the extent of public transit service is not anticipated to be sufficient to warrant a Group IV designation, all efforts should be made to provide and encourage public transit and carpool/vanpool ridership. The Transit Easement is an important element of the transportation network in the I-270 corridor as it would provide service at least as far north as Clarksburg, and possibly as far as Frederick. Also important is the provision of an internal and external bus system. The internal system should provide connections between residential areas, transit stations, and employment opportunities. This system would support ridership on the Transit Easement and the commuter rail service; it would also provide public transit service for those who live and work in Germantown. The external system should provide transit linkages between Germantown and employment centers that are not served by fixed-route transit, such as Shady Grove West or the Davis Tract. It should also provide service from residential areas that are not served by the transit easement and Metrorail, to employment centers in Germantown.

Park-and-ride lots are also an important component of the transportation system. They facilitate the formation of carpools and vanpools for employees whose residences and work locations are not conveniently served by public transportation.



Intersection Level of Service

Level of Service

- D 
- E 
- F 



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It is possible that the results of the studies being worked on for the conceptual feasibility and project planning of the Corridor Cities Transit Easement could result in a higher level of transit service being decided on and programmed. If that turns out to be the case, then consideration of an amendment to this Master Plan would be in order to see: a) if a standard of Average LOS D should be used; and b) if it is used, then what the effect of that LOS would be on the recommendations of the Plan.

Comparison of Average Congestion Levels to the Standard:

As a result of the Germantown Master Plan Amendment process, nearly 40 land use density/transportation system alternatives have been analyzed. A selected subset of these alternatives were determined to warrant detailed analyses. Table G-1 presents a summary of the assumptions for each of these selected alternatives, as well as the expected areawide average level of service in Germantown. Based on these alternatives, a single land use/transportation scenario is recommended in this Plan.

The Preliminary Draft Plan stated that the land use intensity should be limited to a maximum of 0.5 FAR in the Analysis Areas of the Germantown Employment Corridor in order to achieve an areawide average level of service C/D. For analysis areas west of I-270, the intensity in some cases was reduced below 0.5 FAR in order to keep intersection levels of service within acceptable limits of mid-point of LOS E.

The recommendations of this Plan differ from those of the Preliminary Draft in that the intensity and mix of development in selected areas in Germantown have been changed. In particular, high density housing has been increased in the Employment Corridor while simultaneously reducing the amount of employment development. Further, the extension of Crystal Rock Drive has been removed from the transportation analysis because of the impact its construction would have on the environment and on Black Hill Regional Park.

Based on the evaluation of alternative scenarios, a land/use transportation alternative is recommended that achieves the land use planning objectives for the Employment Corridor and maintains the level of service standards for Germantown.

Results of the Areawide Level of Service Analysis:

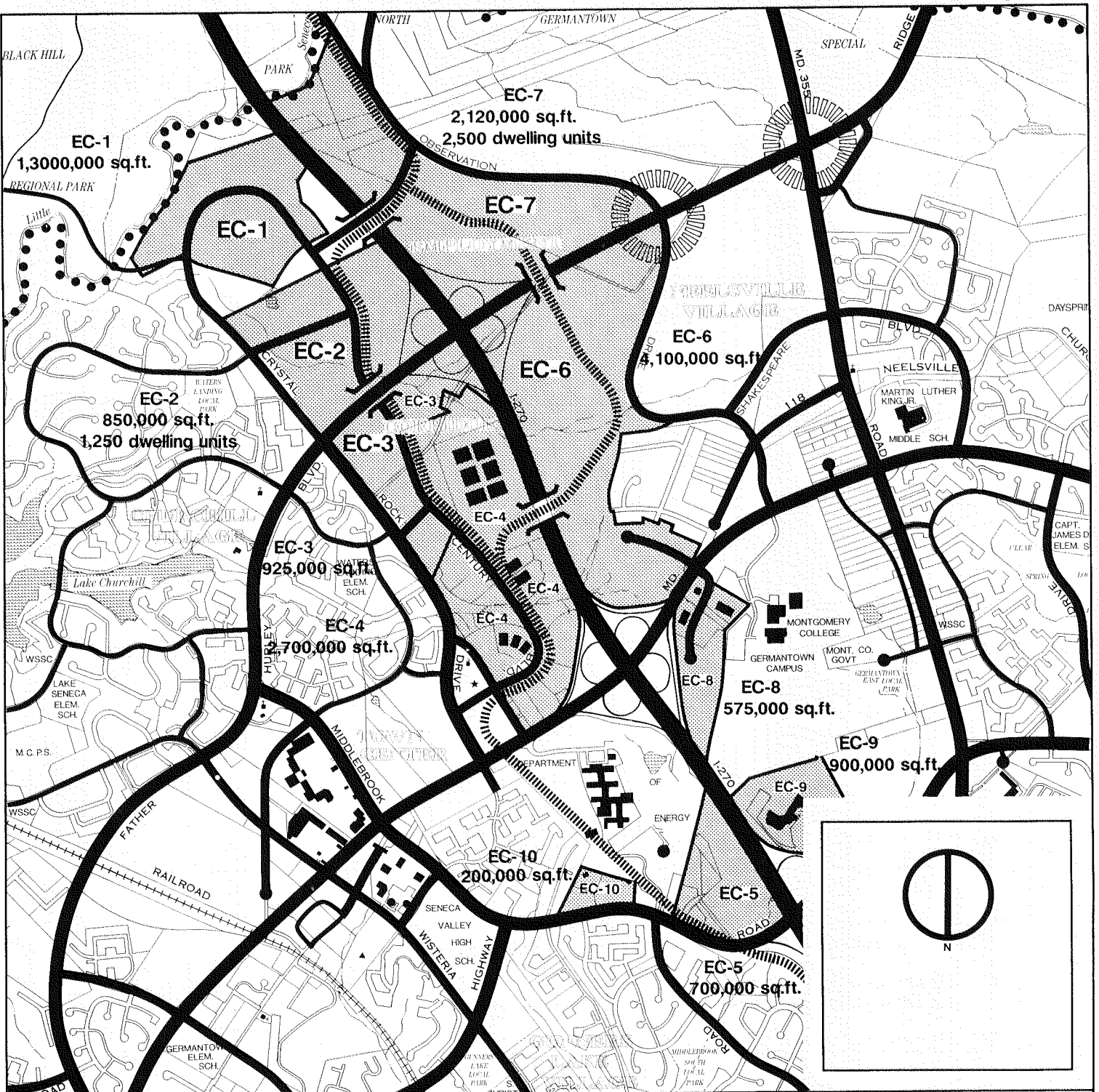
The recommended end-state land use/transportation scenario includes 78,000 jobs and 37,000 households in the Germantown Planning Area and the Final Draft Plan roadway network, with the addition of a northern crossing of I-270, four grade-separated interchanges, one grade-separated intersection, and modification of several arterial roadways in the

TABLE 19 SUMMARY OF ROADWAY ASSUMPTIONS FOR RECOMMENDED LAND USE / TRANSPORTATION SCENARIO	
Roadway Projects Considered	Roadways Included *
Modification to A-291, A-270 and I-3 in the vicinity of the proposed Neelsville Mall	x
Northern Crossing of I-270	x
Interchange at North Crossing and I-270	
Collector Distributor Roads for I-270 from Father Hurley Boulevard to Middlebrook Road**	
Crystal Rock Drive Extension	
Grade-Separated Interchange at: Father Hurley Blvd./Century Blvd	
Ridge Road/Observation Drive	x
Ridge Road/MD 355	x
M-83/MD 118	x
M-83/Middlebrook Road	
MD 117/Great Seneca Highway	x
Father Hurley Blvd./Crystal Rock Drive	
Grade-Separation at Father Hurley Blvd./Century Boulevard	x

* Included roadways are shown with an "x".

vicinity of the proposed regional shopping mall. As a subset of the planning area land use totals, development densities yielding approximately 59,000 jobs and 3,800 households are assumed for the Germantown Employment Corridor. The road network assumptions used in the recommended scenario are provided in Table 19 along with several potential projects which were considered but not included.

The areawide average LOS C/D would be maintained under this scenario. This result is comparable to the LOS results achieved under the "Base Test" (See Appendix G). The road system's ability to accommodate the additional development beyond the "Base Test" can be attributed to the additional road capacity provided by the transportation projects indicated in Table 19, as well as the change in land use mix resulting in a lower jobs-to-housing ratio. This latter factor tends to produce shorter trips resulting in less travel in the Germantown area. However, since this scenario reflects somewhat more development than in the Preliminary Plan "Base Test," the same average areawide levels of congestion as in the "Base Test" are anticipated. Four grade-separated interchanges included in the recommended scenario provide only a



Employment Corridor: Anticipated Development

Analysis Areas and Anticipated End-State Residential Dwelling Units and Building Area in Square Feet

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TABLE 20

END-STATE BUILDING AREAS, JOBS AND RESIDENTIAL UNITS
IN THE EMPLOYMENT CORRIDOR

Analysis Area	Total Acres	Acres	Employment			Acres	Residential Density	Units***
			FAR	Bldg. Area*	Jobs**			
EC-1	75	75	.40	1,300,000	5,200	—	—	—
EC-2	108	39	.50	850,000	3,400	69	R-30/PD-22	1,250
EC-3	84	32	.25	350,000	1,400	—	—	—
		52	.50	1,130,000	4,500			
EC-4	120	105	.50	2,300,000	9,200	—	—	—
		15	.60	400,000	1,600			
EC-5	40	40	.40	700,000	2,800	—	—	—
EC-6	188	188	.50	4,100,000	16,400	—	—	—
EC-7	200	72	.50	1,600,000	6,300	104	R-30/PD-35	2,500
		24	.50	520,000	1,700			
EC-8	32	32	.50	575,000	2,300	—	—	—
EC-9	41	41	.50	900,000	3,600	—	—	—
EC-10	11	11	.40	200,000	800	—	—	—

* The building area is an approximation based on the allowable FAR of the recommended zone, taking into account existing development in Analysis Areas EC-4 and EC-8.

** The number of jobs is an approximation based on an average of 250 square feet per employee in the I-3, I-1, and Town Sector Zones and 300 square feet in the R&D Zone.

*** The number of units include MPDU's.

marginal amount of areawide capacity; their prime function is to improve local intersection operations.

Local Area Intersection Analysis

An analytical technique comparable to the one being used in the Local Area Transportation Review in assessing traffic impacts of proposed subdivisions was also used in this local transportation analysis. The specific technique is the "Critical Lane Volume" method. As applied to the Germantown Master Plan analysis, it involves the use of: a) the areawide transportation model to obtain background turning movement estimates at the identified intersections; b) the sub-zone system to define "parcels" of the major employment locations; and c) the standard of acceptable level of congestion for intersections. The standard of acceptable intersection level of service for intersections used in this analysis is mid-point of LOS E, with a Critical Lane Volume summation of 1,525. This is the same standard being used in intersection analysis in the Local Area Transportation Review procedure.

Local intersections within the Germantown Employment Corridor would function at acceptable levels of service (better than the mid-point of LOS E) under the recommended scenario. The four grade-separated interchanges included in this Plan are some of those requested in the Executive staff's comments on the Preliminary Draft Plan. They are the ones that result in improvements to local congestion levels and appear more feasible to implement. However, it should be noted that in the event further study shows that one or more would be infeasible to implement, then the specific development intensity of nearby parcels within the Employment Corridor might not be able to achieve the amount assumed in the recommended land use scenario. Figure 32 depicts the results of the local area intersection analysis for the recommended scenario.

The results of the local area analysis for development at the recommended densities in the Employment Corridor show that the six intersections that would be prime access points to the proposed major Germantown Employment Corridor would generally have acceptable intersection levels of service, at LOS E or better. However, it should be noted that the MD 355 and MD 117 corridors are estimated to have unacceptable (LOS F) levels of intersection congestion. A more detailed examination of these unacceptable local levels of service along MD 355 and MD 117 corridors indicates that high levels of through traffic from outside the Germantown area appear to be the major contributor to those unacceptable local levels of service.

It is noted that, in projecting traffic volumes at the identified major intersections, the "background" traffic volumes were produced by using results from the sub-area transportation model. These background

traffic volumes were then modified, using appropriate Institute of Transportation Engineers trip generation rates, in order to have a better estimate of the number of peak hour trips in the vicinity of the Employment Corridor. Similar procedures were used to estimate the "site related" traffic associated with different activity levels in the Employment Corridor. These modified background and site traffic volumes were then used to calculate the local intersection levels of service. In projecting levels of congestion at each major intersection, the most desirable geometric conditions for at-grade intersections were used.

Recommendations of the Master Plan

End-State Building Areas

The transportation analysis indicates that the proposed end-state land use intensity should be limited to a maximum of 0.5 FAR for each Analysis Area on the east side of the Employment Corridor. For Analysis Areas west of I-270, the limits in some cases have been further lowered to keep intersection levels of service within acceptable limits. The end-state building areas shown on Figure 33 and Table 20 are included in the text of the appropriate Analysis Areas.

The parcels available for private development in the Employment Corridor are zoned I-1, I-3, or Town Sector. None of the zones contain a FAR limitation. Therefore, in order to achieve acceptable levels of service, a mechanism to limit end-state building areas (FAR) should be developed. The proposed comprehensive revision to the I-3 Zone and the new R&D Zone are recommended to meet this need.

Master Plan Staging Considerations

The transportation analysis evaluated the end-state development of Germantown when transit service on the easement would be available. Based on this transit service, Germantown is recommended to be a Group III area with an Average Level of Service C/D as the standard. Programming of transit easement service will be a major staging element in the development of Germantown. Until that service is programmed, Germantown should remain a Group II area with an Average Level of Service Standard of C. When that service is programmed, Germantown could be classified as a Group III area and additional development potential should become available for the later phases of development in Germantown.

HIGHWAY RECOMMENDATIONS (Figure 34)

The recommended classifications, minimum right-of-way widths, and number of lanes are indicated on Table 17 and shown graphically on Figure 36.



Proposed Realignment of Midcounty Highway (M-83)

- M-83(MIDCOUNTRY HIGHWAY)
- Master Plan Alignment
- Previous Alignment
- Alternative Alignment

This realignment is an Amendment to the Clarksburg Master Plan and The Functional Master Plan for the Preservation of Agriculture and Rural Open Space in Montgomery County.


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Figure 36



Amendments to the Clarksburg Master Plan

- Revisions to the Alignment of M-83 with Two alternatives Near A-260
- Two Alternative Alignments of A-19
- Addition of Alternative Transit Easement Alignments

HIGHWAY CLASSIFICATIONS

- Freeway
- Major Highway
- Arterial Roadway

TRANSIT EASEMENT

- Alternative Alignments

PROPOSED ROAD A-19

- Alternative A
- Alternative B

M-83(MIDCOUNTY HIGHWAY)

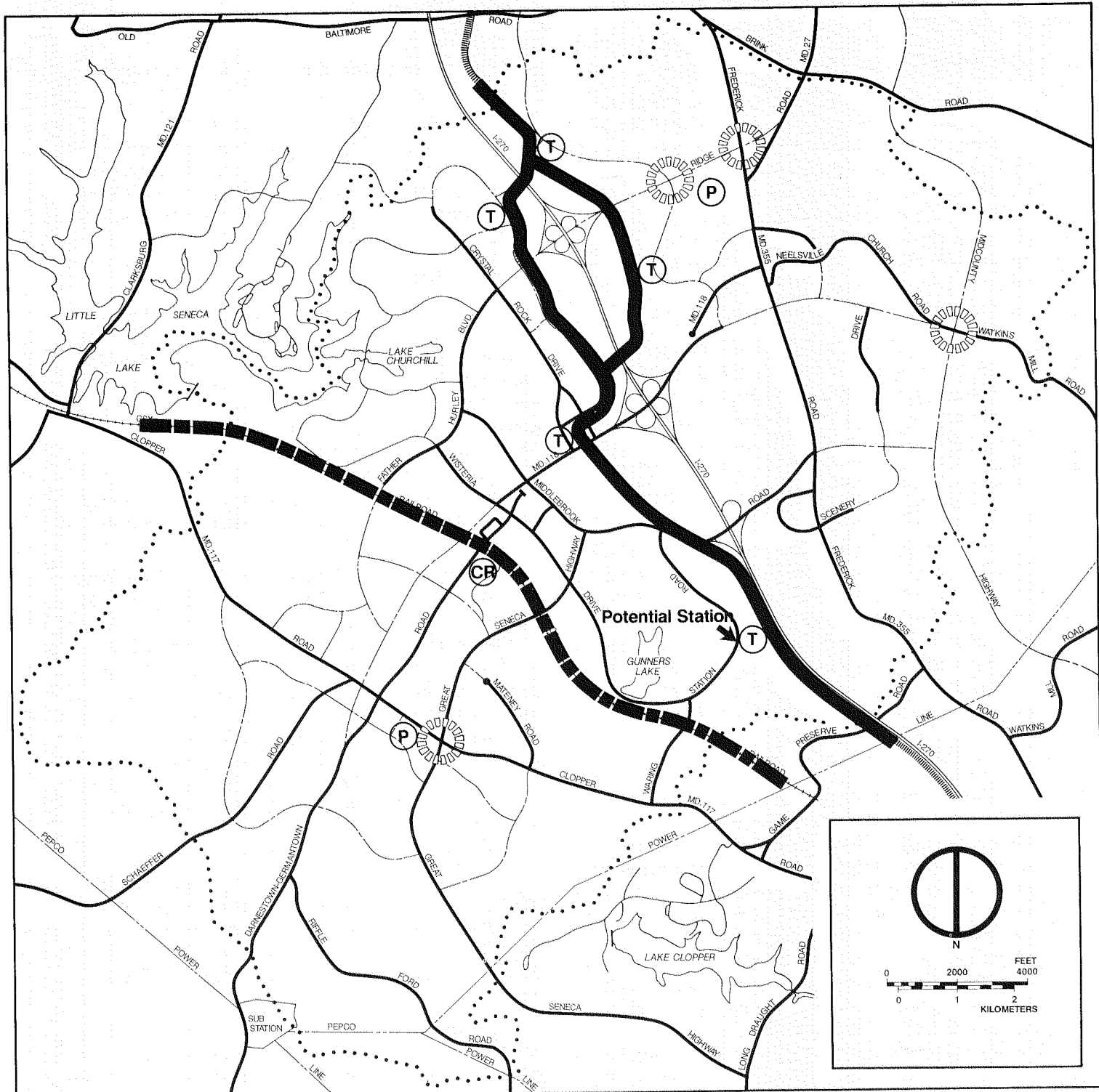
- Master Plan Alignment
- Alternative Alignment

These and other alternative alignments are being studied as part of the Corridor Cities Transit Easement Study(See Master Plan and Figure 39).

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Figure 37



Existing and Proposed Transit Facilities

- Commuter Rail
- *Corridor City Transit Easement Alignment
- Commuter Rail Station
- Park-N-Ride Location
- Proposed Transit Stations

* These and other alternative Alignments are being studied as part of the Corridor Cities Transit Easement Study-See Master Plan and Figure 39.

I-270 and Related Interchanges

The widening of I-270 is one of the most important elements to the implementation of the Plan. I-270 traverses the planning area from north to south, and is recommended for widening to eight lanes through Germantown. In addition, a partial interchange at Middlebrook Road and a full-movement interchange at Father Hurley Boulevard/Ridge Road are recommended in this Plan. The completion of each of these interchanges will increase the traffic capacity of the roadway system serving Germantown.

Collector-distributor (C-D) roads are recommended to be extended from Gaithersburg, through Germantown, to Clarksburg to improve traffic flow, circulation and safety in and between the interchange areas of I-270. The design of the two proposed interchanges in Germantown and the establishment of the right-of-way of I-270 should accommodate the future construction of C-D roads.

A fourth interchange, between M-27 and Black Hill Regional Park, was considered. It is not recommended as a element of this plan because: it is not feasible to implement a new interchange at that location due to localized constraints, the planned transportation network is sufficient to provide access to the recommended land uses, and it would create significant negative impacts on land uses planned nearby.

Major Highways

Several major highways of four to six lanes provide a network that connects Germantown to locations in the region. In addition, they provide local access for trips within Germantown. Each roadway provides a necessary transportation link in the network and, therefore, the construction of each is essential to the implementation of this Plan. The road alignments and the number of lanes recommended in this Plan are intended to provide adequate capacity for the end-state development while minimizing the negative impacts of through-traffic on Germantown's residential communities. Appendix I describes the major highways in Germantown and their planned alignments:

Also included in this Plan is a road alignment change in the Clarksburg Planning Area. The 1968 *Clarksburg Master Plan* indicates that Midcounty Highway (M-83) intersects MD 355 at Brink Road, just north of the Germantown Planning Area. The amended alignment, shown on Figures 35 and 36, keeps Midcounty Highway parallel to MD 355 through the Clarksburg Planning Area, joining it north of Clarksburg. North of A-19, this Plan identifies two possible alignments which should be evaluated as part of the *Clarksburg Master Plan* process. This

alignment change would increase the traffic capacity in Clarksburg.

This alignment change also amends the 1980 *Functional Master Plan for the Preservation of Agriculture and Rural Open Space* since the alignment now crosses Brink Road east of MD 355 and follows Wildcat Road until it turns west crossing MD 355. (See Figures 35 and 36.)

Arterial Roadways

Arterial, business district, and industrial roads have two- to five-lane cross-sections. They generally provide links between major highways and provide access from the major highways to the residential areas in the villages. The alignments of these roads have been designed to facilitate bus transit service. Appendix I describes the alignments of some of the significant arterial roadways. The Proposed Roadway System Map (Figure 33) shows the ultimate highway network just as the land use plan describes the ultimate development pattern.

Two alternative alignments to Observation Drive (A-19) between the Northern Crossing (I-4) and MD 355 are included in this Plan. The western alternative has fewer stream crossings and less anticipated wetland impact than the the eastern alignment. The eastern alignment crosses West Old Baltimore Road sufficiently far from I-270 so that its intersection would enable an interchange with I-270 to be constructed. The western alignment would be too close to I-270. The selection between these alignments will be made as part of the *Clarksburg Master Plan* process.

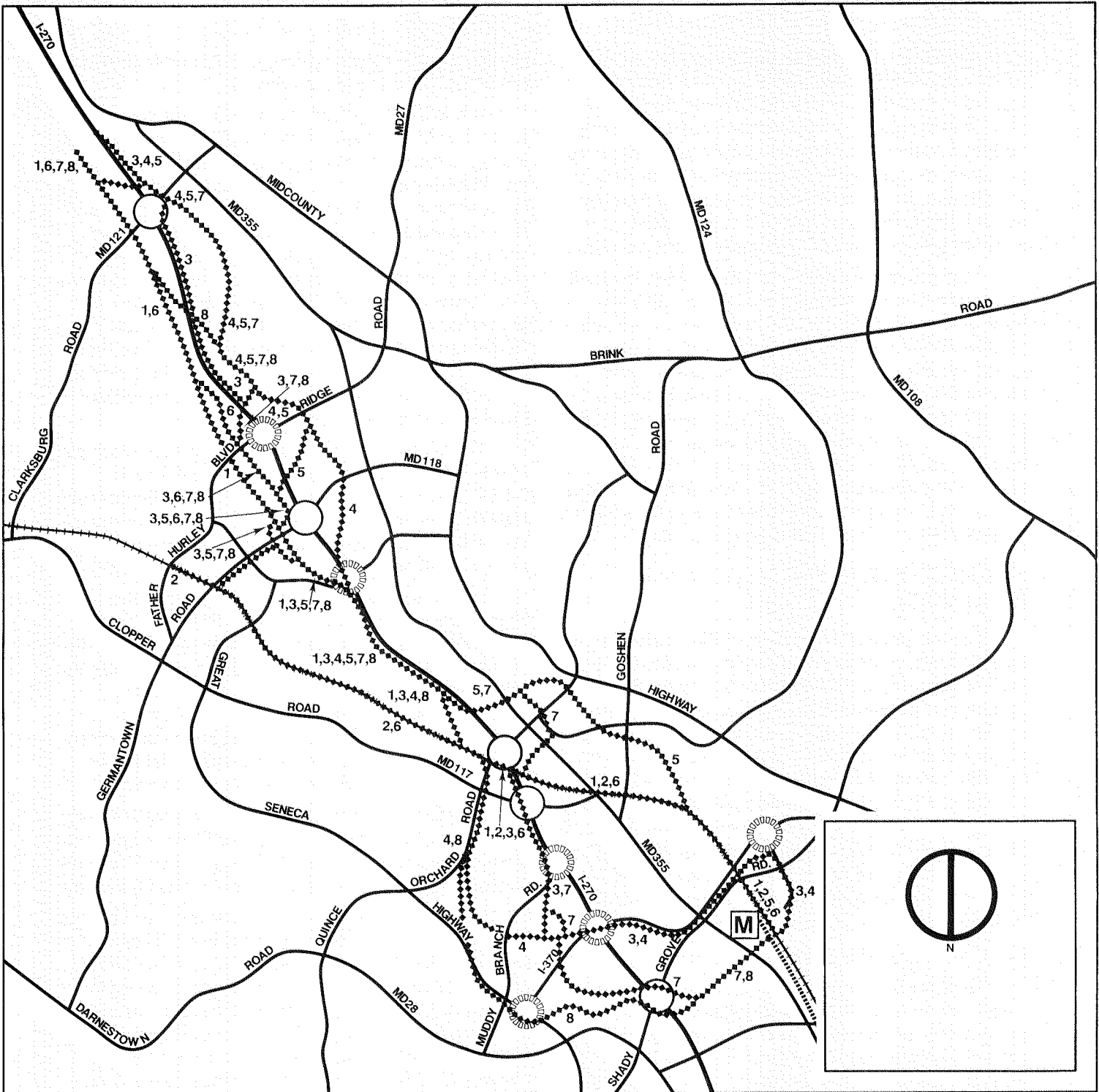
TRANSIT SERVICEABILITY

One of the most significant objectives of this planning effort is to provide a complementary roadway and transit system that serves this vibrant corridor city. The land use recommendations expressed in this Plan are intended to foster a transit-serviceable community.

Detailed planning for transit serviceable land use is evolving. The level of transit serviceability is thought to be the result of a number of interrelated elements such as:

- length of time to wait for the next bus or train;
- ease of access from residences to bus stops and transit stations; and
- ease of access from the transit service to the destination.

The following discussion outlines a number of objectives for land use or transit planning and operations that would enhance the use of transit. The higher the frequency of transit service, the more people will use it. The provision of a paved or sheltered place to wait also encourages use. Residential sub-



Proposed Corridor Cities Transit Easement Alignments

- Proposed Alternative Transit Easement Alignments
- Railroad
- Existing Shady Grove METRO Station

Note: The numbers(1-8)next to the proposed transit alignments represents the total number under study.

sions need to be designed so that busses can easily circulate on collector streets and so that residents can walk or bike easily and directly to a bus stop. Shopping centers and major employment areas should be designed so that busses can stop near main entrances or at least so that a safe and direct pedestrian route is provided to the entrance from the bus stop. The two urban villages are recommended to be located on the transit easement in order to increase transit ridership.

As noted in the transportation analysis, internal and external bus systems should be provided. The transfer time should be minimized where these two systems connect. It is important to provide an integrated system of public transit services as well as park-and-ride lots for transit riders and carpoolers in order to meet the needs of the residents and workers in Germantown. Work that is still on-going as part of the Corridor Cities Transit Easement Study will be directed at elaborating on these ideas. In addition, recommended refinements of the setbacks in the I-3 Zone are designed to increase transit-serviceability.

TRANSIT RECOMMENDATIONS (Figure 37)

The components of the Transit Plan include transit easements, commuter rail services, regional and local bus service now being provided by the Ride-On System, and park-and-ride facilities. Use of transit services should be encouraged through the provision of safe pedestrian and bicycling connections between building entrances and the adjacent streets. Major buildings or groupings of buildings should be located close to adjacent roadways to reduce the distance transit riders have to walk. Further, in residential subdivisions sidewalks, pathways and bikeways should be provided to better connect residents to streets with transit service.

The Corridor Cities Transit Easement

The Corridor Cities Transit Easement is a proposed right-of-way 70 feet wide extending from the Shady Grove Metro station north through the corridor cities of Gaithersburg, Germantown, and Clarksburg (See Figure 38), with the potential for an ultimate extension to Frederick. This Plan recommends two alignments for the Germantown area as shown in Figure 37. Two alignments would allow transit to serve employment and residential uses on the east and west side of I-270, as well as the Town Center. At a future date, it will be necessary to determine whether the employment and residential population of Germantown can support two transit easements. If not, the Plan recommends that the preferable alignment be determined at that time.

These alignments are different from that shown in the 1974 *Master Plan*, but both alignments are sub-

stantially similar to ones being considered in the Corridor Cities Transit Easement Study.

It is important to assure that the right-of-way for future transit service be protected. The Corridor Cities Transit Easement Study began in the spring of 1988. It will identify and review alternatives in land use patterns, various transit types and specific alignments ridership estimates, environmental impacts, station and storage yard locations, and site analysis associated with the transit easement. This study is an important element of the parallel and subsequent master plans studies in Gaithersburg, Germantown, and Clarksburg, and has significant implications for the General Plan as well. It will provide a better basis for right-of-way reservation, and will provide guidance to subsequent project design studies.

The alignments might include at-grade crossings of major highways such as: Middlebrook Road (M-85), MD 118 (M-61), and Father Hurley Boulevard (M-27). The effect of such crossings on both the operation of transit service and the capacity of the roadway network will be explored in the upcoming study.

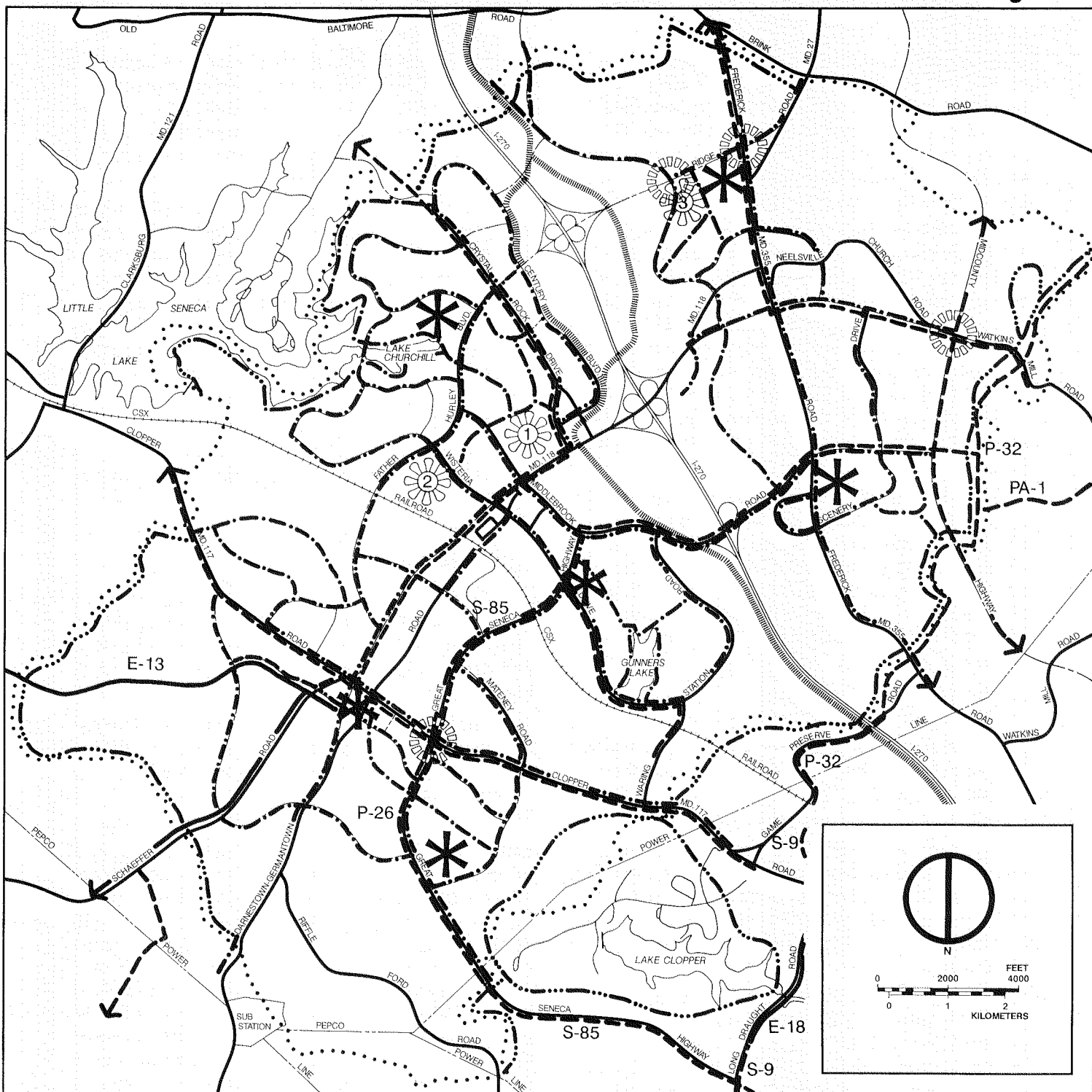
In addition to the preferred alignment, other alignments are being considered in the study. Since these alternative alignments are likely to affect the development in this area, the selection of a single alternative should be made as soon as possible. These alternatives are shown on Figure 38. The County Council, as part of the master plan process in Germantown, should determine the most appropriate alignment for the transit easement in Germantown.

In order to protect the right-of-way for the transit easement in Clarksburg, this Master Plan recommends amending the 1968 *Clarksburg Master Plan* in order to add two alternative alignments. (See Figure 36.)

Four transit station locations are proposed by this Plan. One location is adjacent to the eastern edge of the Mixed-Use Center, in Analysis Area TC-2. The second is located in EC-6, the Marriott site, close to proposed M-27, Goldenrod Drive and the regional mall. The third is located in Analysis Area EC-2, adjacent to Father Hurley Boulevard and Crystal Rock Drive in the west Urban Village. A fourth is in Analysis Area EC-7 near Observation Drive in the East Urban Village. Other possible locations for stations or transit vehicle stops will be considered in the Transit Easement Study. Analysis Area GL-2 is one possible location. An area of approximately 10 acres should be available at each of these sites for the station, parking, bus bays, and kiss-and-ride areas. Approximately 1,000 spaces could be provided at each station.

Commuter Rail

Commuter rail service provides an alternative to using automobiles to travel to several down-County business districts and to downtown Washington. The



Existing and Proposed Bikeways, Major Pedestrian Connections and Equestrian Trails

BIKEWAYS

Existing and Proposed

MASTER PLAN OF BIKEWAYS DESIGNATIONS

E-Existing

S-Programmed

P-Proposed

PA-Proposed by Area
Master Plan Proposed

EXISTING AND PROPOSED PEDESTRIAN CONNECTIONS

Sidewalks/Pathways

PROPOSED PEDESTRIAN TRAILS

Existing and Proposed

Village Centers

ACTIVITY NODES

- 1. Mixed-Use Center
- 2. Retail and Service Park
- 3. Regional Mall



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NOTES:
 • Location and design of proposed bikeways to be determined at time of roadway design and engineering.
 • Bikeways shown in conjunction with roadways are not designated by A Project Number in all Cases.

Germantown commuter rail station is located near existing MD 118, just west of the B&O Railroad tracks. Based on a survey in March 1986 by the Maryland Department of Transportation, approximately 150 passengers board the six trains at the Germantown station each weekday morning. A 138-space parking area is currently under construction.

This service enables local residents using the rail line to have access to Metro by transferring at the Rockville or Silver Spring stations. Should the Silver Spring commuter rail station be relocated closer to the Metro station, the commuter rail line would form a more direct cross-County link between the two arms of the Metro Red Line. An intermodal (Metro/commuter rail) terminal at Silver Spring is being evaluated by the MdDOT. Ride-On bus service is provided between the Metro and commuter rail stations in Silver Spring.

This Plan recommends that the parking facilities at the commuter rail station in Germantown be expanded. Montgomery County DOT has acquired two parcels on the east side of the railroad tracks. State DOT is preparing plans for the construction of a 250-space parking facility on those parcels. The development of this area will enhance the use of commuter rail service.

Bus Service

Public bus service provides an additional alternative to the automobile for commuting, for trips within Germantown, and for trips to locations in Gaithersburg and Rockville.

Public bus transit service is currently provided in the Germantown area by the County's Ride-On system. The system has been incrementally expanded to include more frequent service and new routes. The system connects Germantown with employment areas in Gaithersburg and Rockville and to the Shady Grove Metro station.

As Germantown develops, there will be increased demand for Ride-On and/or Metrobus service in order to continue to provide an attractive alternative to automobile commuting. A transit center should be located in the Town Center to facilitate the transfer of passengers among several bus routes.

In order to increase accessibility for employees going to and from the transit stations, this Plan encourages the establishment of a shuttle bus service. This service could also provide lunchtime service to the Town Center. Funding for the service could come from a consortium of the major employers in the Employment Corridor.

Park-and-ride Lots

Two park-and-ride lots are recommended to be developed. (See Figure 37.) One site is adjacent to the

Regional Shopping Mall site in Neelsville Village. This location would provide an opportunity for people traveling on MD 27 and MD 355 heading for I-270 to conveniently meet for carpools, vanpools and commuter buses that could go to locations not directly served by the transit easement.

The other lot is located along Clopper Road near its intersection with Great Seneca Highway. This intersection is anticipated to operate at an unacceptable level of service when Germantown is fully developed. (See Figure 32.) The projected congestion is due to through traffic from Boyds and Clarksburg. This park-and-ride lot is located to serve these commuters (as well as residents of Germantown) and reduce congestion.

The exact location and size of these lots should be determined at the time of subdivision approval and/or as the result of an appropriate capital project planning study.

PEDESTRIAN AND BIKEWAY PLAN RECOMMENDATIONS (Figure 39)

The bikeway recommendations expressed in this Plan incorporate and augment the 1978 *Montgomery County Master Plan of Bikeways*. The proposed locations and classifications of these bikeways are shown on Figure 39.

The Pedestrian Plan has been developed in conjunction with the Townscape Design chapter. The Pedestrian Plan has been guided by the following recommendations.

This Plan recommends that sidewalks be constructed on at least one side of roadways at the time of initial construction or widening. This is in accordance with current practice. The sidewalks should be funded as an integral part of the road project. In addition, pathways are recommended to be developed in community open space areas to enable residents an opportunity to enjoy the natural beauty of the area. Both the sidewalks and the pathways should provide pedestrian connections between residences and such destinations as parks, schools, shopping areas, transit stops, employment areas, and community centers. Although these pathways may be used by cyclists, they are not designated as bikeways and are not required to meet bikeway design standards. Where pathways go through open space areas within a subdivision, the common space should be a minimum of 20 feet wide to provide some privacy to the adjoining yards. The major pedestrian connections are shown on Figure 39.

As noted above, pedestrian connections should be provided to facilitate the use of transit services. These connections would include sidewalks and pathways to connect residents to streets with transit serv-

ice, to walkways between major buildings or groups of buildings and to adjacent streets.

In some areas of Germantown, the pedestrian network is incomplete. This Plan recommends that Montgomery County DOT work with the homeowners associations in providing connections to the sidewalks in the street rights-of-way. In some cases, site plan enforcement may be needed to extend pathways within communities so that they connect to sidewalks or other open space areas. In order to facilitate safe pedestrian movement at intersections, free-right-turns are discouraged.

Grade-separated pedestrian crossings should be studied at locations where major highways need to be crossed by children going to and from schools. As activities at the schools are not limited to the times when school crossing guards are present, a conflict exists. One means of relieving the conflict is a grade-separated pedestrian crossing. The use of such a crossing is dependent on a number of detailed site conditions, such as whether one side at least is at the same elevation of the crossing as it passes over the street or whether a barrier exists that prohibits crossing the street at-grade. Although these conditions are too detailed for a master plan effort, this Plan does recommend that grade-separated crossing should be explored as part of plans to widen or construct roads at the following locations:

- Relocated MD 118 west of proposed road A-254, between Germantown Elementary School and the residential community to the north.
- MD 355 near Gunners Branch Road, connecting residential areas to Fox Chapel Elementary School and to retail services.

EQUESTRIAN TRAILS SYSTEM

There are a number of equestrian trails in Montgomery County which have been established and maintained by user groups on an informal basis. Figure 39 shows the general locations of the existing and proposed equestrian trail system in the Germantown area.

The continued use and enjoyment of these trails is being threatened by future development. Therefore, this Plan recommends that an attempt be made to accommodate these trails as development occurs. Section 50-30 of the Subdivision Regulations was amended in 1982 to provide that the Planning Board, through subdivision process, may require dedication to public use of right-of-ways or platting of easements for equestrian trails. The Plan recommends further that those portions of the equestrian system located on public lands be continued with appropriate regulations and user group maintenance.