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APPROVED AND ADOPTED GAITHERSBURG VICINITY MASTER PLAN

TECHNICAL APPENDIX

January 1985

Note: Only a limited number of copies of this Technical Appendix are available. Copies have been placed in local libraries for public review. Please contact Lyn Coleman (495-4565) or Pat Plunkett (495-4600) for further information.

This document contains information used during the Master Plan process. No attempt has been made to update it.

The Maryland-National Capital Park and Planning Commission
8787 Georgia Avenue, Silver Spring, Maryland 20907

ABSTRACT

TITLE: Approved and Adopted Gaithersburg Vicinity Master Plan
Technical Appendix

AUTHOR: The Maryland-National Capital Park and Planning Commission

SUBJECT: Background data and analysis for the Gaithersburg Vicinity Master Plan

DATE: January 1985

PLANNING AGENCY: The Maryland-National Capital Park and Planning Commission
8787 Georgia Avenue, Silver Spring, MD 20910-3760
and
14741 Governor Oden Bowie Drive, Upper Marlboro, MD 20870

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ABSTRACT: This document contains maps and supporting background data to support the land use and zoning recommendations of the Gaithersburg Vicinity Master Plan. Economic, housing and transportation forecasts are included; future and programmed roadway, sewerage and water projects are described in detail; and environmental guidelines for future development are discussed.

Price $1.50

The analyses in this Appendix were used to develop recommendations for the Final Draft Gaithersburg Vicinity Master Plan. The Montgomery County Planning Board staff prepared this report which is provided for information only. It has not been submitted to, nor has it been approved by, the Planning Board or County Council.

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THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

The Maryland-National Capital Park and Planning Commission is a bi-county agency created by the General Assembly of Maryland in 1927. The Commission's geographic authority extends to the great majority of Montgomery and Prince George's Counties: the Maryland-Washington Regional District (M-NCPPC planning jurisdiction) comprises 1,001 square miles, while the Metropolitan District (parks) comprises 919 square miles, in the two Counties.

The Commission has three major functions:

(1) the preparation, adoption, and from time to time amendment or extension of the General Plan for the physical development of the Maryland-Washington Regional District;

(2) the acquisition, development, operation, and maintenance of a public park system; and

(3) in Prince George's County only, the operation of the entire County public recreation program.

The Commission operates in each county through a Planning Board appointed by and responsible to the county government. All local plans, recommendations on zoning amendments, administration of subdivision regulations, and general administration of parks are responsibilities of the Planning Boards.

TABLE OF CONTENTS

This Technical Appendix includes background data and analysis which support the land use and zoning recommendations of the Final Draft Gaithersburg Vicinity Master Plan. Economic, housing and transportation forecasts are included in the Appendix. Future and programmed roadway, sewerage and water projects are described in detail; and environmental guidelines for future development are discussed.

LIST OF MAPS

LIST OF TABLES

APPENDIX 1

GAITHERSBURG VICINITY MASTER PLAN PROCESS SUMMARY

PURPOSE	EVENT	ACTIVITY
Public forums, and meetings with business organizations and community groups to identify and discuss issues.	Joint Issues Forum 10/25/79 Community Facilities Forum 10/21/80 Emory Grove Village Tenants Assoc. 11/5/80 Joint Housing Forum 11/13/80 Joint Retail & Employment Forum 12/9/80 Deer Park/Oakmont/Walnut Hill Area Residents 3/1/81 Suburban Maryland Home Builders Assoc. 4/15/81 Community Housing Resources Board 4/23/81 Washingtonian Tower Condo. Inc. 5/12/81 I-270 Corridor Employers Group 5/14/81 Montgomery Village Foundation 5/18/81 Joint Transportation Forum 5/27/81 Joint Transportation Follow-up Workshop 6/10/81	Staff gathers and organizes data and issues.
		Staff analyzes data and issues and prepares Staff Draft Plan.
	STAFF DRAFT PLAN	
Opportunities for public participation.	Open House 11/21/81 Public Forum 12/1/81 Planning Board Worksessions & Revisions 12/7/81 through 1/18/83 Planning Board Approval	Staff analyzes issues and concerns raised, and prepares draft responses.
	PRELIMINARY DRAFT PLAN	
Opportunities for public participation.	Planning Board Public Hearing on Preliminary Draft 4/5/81 and 4/6/81 Planning Board Worksessions & Revisions 4/81 to 7/83 Planning Board Approval August 5, 1983	Staff analyses and responds to issues and concerns raised.
	FINAL DRAFT PLAN	
Opportunities for public participation.	County Council Public Hearing on Final Draft County Council Worksessions County Council Approval Planning Commission Adoption	Staff analyzes and responds to issues and concerns raised.

GAITHERSBURG VICINITY MASTER PLAN PROCESS SUMMARY (Cont'd.)

PURPOSE	EVENT	ACTIVITY
	APPROVED AND ADOPTED PLAN	
	THE SECTIONAL MAP AMENDMENT PROCESS	
	Preparation of Sectional Map Amendment Planning Board Approval to File Sectional Map Amendment with District Council	Staff prepares recommended rezoning application based on approved Zoning Plan.
Opportunities for public participation.	District Council Public Hearing District Council Worksessions Approval by District Council to enact Zoning Changes	Staff analyzes and responds to issues and concerns raised.

APPENDIX 2

BACKGROUND DATA

A. TRANSPORTATION

The traffic capacity of master planned roads influenced land use recommendations for the Gaithersburg Vicinity Area. A transportation model which projects the impact of new development upon future roads was used during the plan process to balance traffic generation and roadway capacity. A description of the model is included in this section.

The I-270 Corridor is planned to be served by a set of major roadways basically parallel to the axis of the corridor. These parallel roadways are connected by other cross-corridor roadways like rungs on a ladder. The more the elements of the ladder are in place, the more effective the network. At present, several key pieces have not been constructed causing stress on the existing framework, particularly at the intersections. The major highway improvement and construction projects now being programmed will relieve many of the current problems. There will, however, always be periods when traffic volume exceeds the existing capacity. The balance between traffic and capacity in a master plan should be achieved when the roads and land uses are all developed. In the intervening years, incremental staging decisions will be handled through the Adequate Public Facilities Ordinance (APF) and the County's Capital Improvements Program (CIP), as guided by the Comprehensive Planning Policies Report (CPP). This section describes road improvements now underway or planned for construction.

Existing Conditions

Traffic flow in the Gaithersburg area is characterized by heavy use of its arterial routes, particularly by commuters during the morning and evening rush hours. (See page 5 .) In addition, there is heavy congestion around the Gaithersburg I-270 interchanges, which are characterized by substandard design. Several of the principal roadways in the area, including MD 355, Shady Grove Road, Montgomery Village Avenue, Clopper Road (MD 117), and MD 28 exhibit severe congestion. Large amounts of commuter and general traffic are already carried by MD 115 and MD 124 which, in addition, will serve as important future access routes to the Shady Grove Metro station.

Several intersections along the heavily travelled commuter routes currently experience Level of Service (LOS) D or E conditions. (See Table A for an explanation of the LOS measures.) Examples of such intersections include MD 355/Shady Grove Road, MD 355/ Montgomery Village Avenue (MD 124), Shady Grove Road/Gaither Road, Shady Grove Road/Choke Cherry Road, Clopper Road/Quince Orchard Road (MD 124), MD 28/Shady Grove Road, MD 28/Glen Mill Road, MD 28/Muddy Branch Road, and MD 28/Travillah Road. These intersections are shown on page 5 .

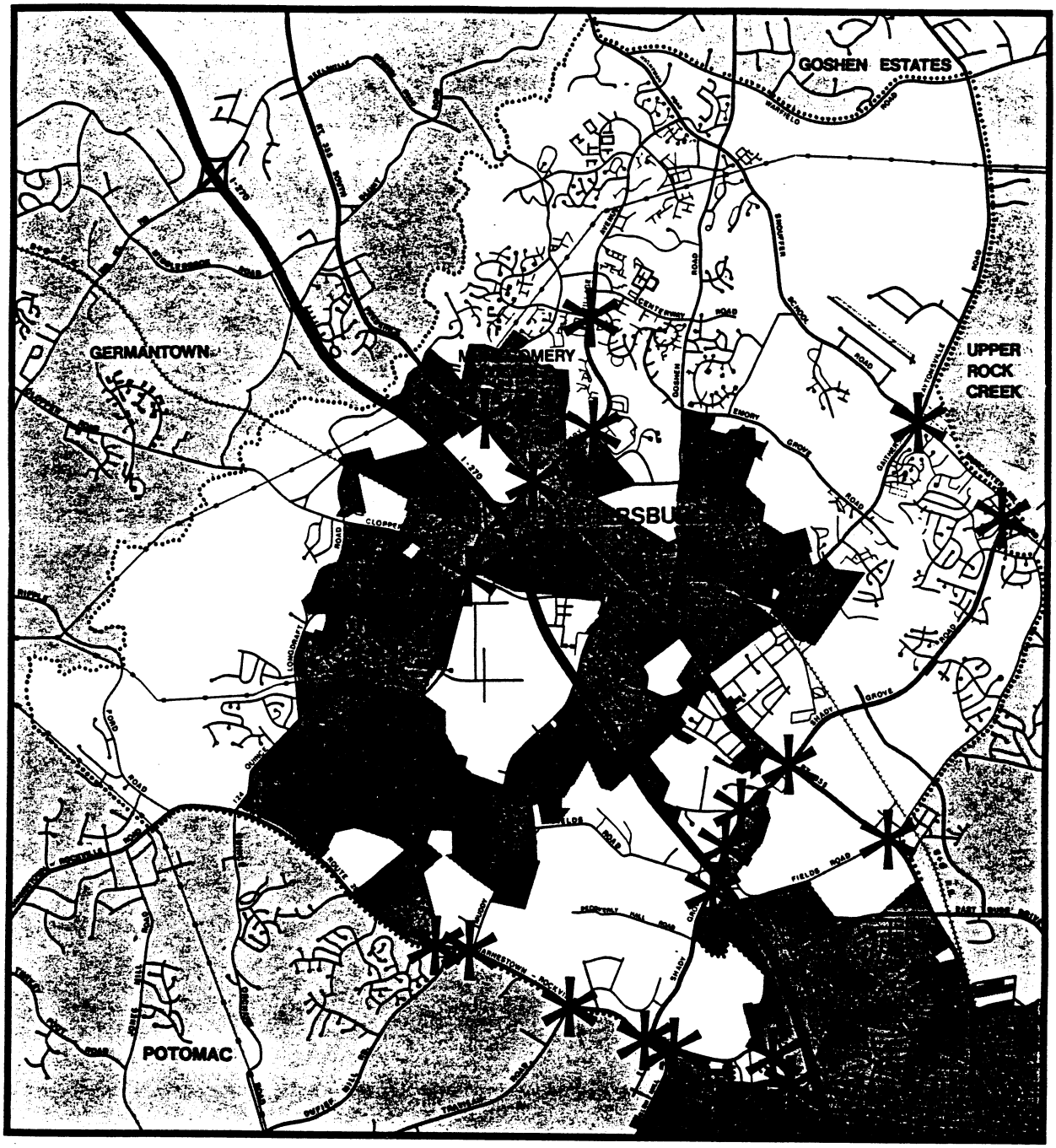
In response to these conditions, several roadway improvements in the Gaithersburg area have been placed in the current CIP for design and construction funding. These improvements will address both existing and projected transportation problems. The improvements listed below are among those shown on page 7 and contained in Table B.

TABLE A

HOW LEVEL OF SERVICE IS DETERMINED

"Level of service" is a traffic engineering term which describes conditions on a segment of roadway. There are six levels, ranging from free flowing conditions to very heavy traffic with extremely unstable flows and long delays. "Levels of service" are identified alphabetically. The terms are as follows:

Level of Service	Characteristics
"A"	Free unobstructed flow, no delays. All traffic signal phases sufficient in duration to clear all approaching vehicles.
"B"	Conditions of stable flow, very little delay. A few signal phases are unable to handle all approaching vehicles.
"C"	Conditions of stable flow, delays are low to moderate, full use of peak direction signal phase(s) is experienced.
"D"	Conditions approaching unstable flow, delays are moderate to heavy. In a significant number of signal phases, during short durations of the peak traffic period, traffic will not clear a signalized intersection.
"E"	Conditions of unstable flow, delays are significant, signal phase timing is generally insufficient. Congestion exists for extended duration throughout the peak period.
"F"	Very long delays. Jammed traffic conditions.



INTERSECTIONS AT LEVEL OF SERVICE D OR LOWER

PLANNING AREA BOUNDARY

MUNICIPALITIES

BASED ON EXISTING TRAFFIC AND INTERSECTION CONFIGURATION AS OF 1982

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Key West Avenue/MD 28

Key West Avenue (MD 28 Relocated) will be extended from the Great Seneca Highway west to MD 28. Two lanes of Key West Avenue, from Shady Grove Road to the Great Seneca Highway, are under construction as a joint County and private developer project. Included in this project are spot improvements to existing MD 28. While the exact scope of these improvements is still being developed, it is anticipated that improvements to intersections and widening of selected roadway sections will be included.

Phase I improvements include the construction of two lanes of an ultimate four-lane roadway from Shady Grove Road to Great Seneca Highway. Phase II improvements include: (1) extending Key West Avenue from Great Seneca Highway to MD 28 as two lanes of an ultimate four-lane facility; (2) widening MD 28 to a four-lane facility from approximately Treworthy Road to its intersection with Key West Avenue; (3) widening MD 28 to four lanes between Shady Grove Road and Glen Mill Road; and (4) widening MD 28 to four lanes from Research Boulevard east to the existing four-lane section at I-270.

MD 124/I-270 Interchange

The Phase I improvements to the MD 124/I-270 interchange have been programmed for construction by the Maryland Department of Transportation (MDDOT). These improvements include the widening of Clopper Road from I-270 up to and including improvement of the Clopper Road/Quince Orchard Road intersection. New ramps will be constructed where I-270 passes over Clopper Road. These ramps will include southbound Clopper Road to southbound I-270, northbound I-270 to northbound Clopper Road, and northbound I-270 to eastbound Montgomery Village Avenue.

In addition, the city of Gaithersburg, the state of Maryland, and developers of adjacent properties will widen Clopper Road between Longdraft Road and Quince Orchard Road.

Shady Grove Road/I-270 Interchange

Improvements to the Shady Grove Road interchange have been added to the County CIP. These improvements are intended to provide additional ramp capacity and to enhance circulation and safety in the area.

Shady Grove Area Road Improvements

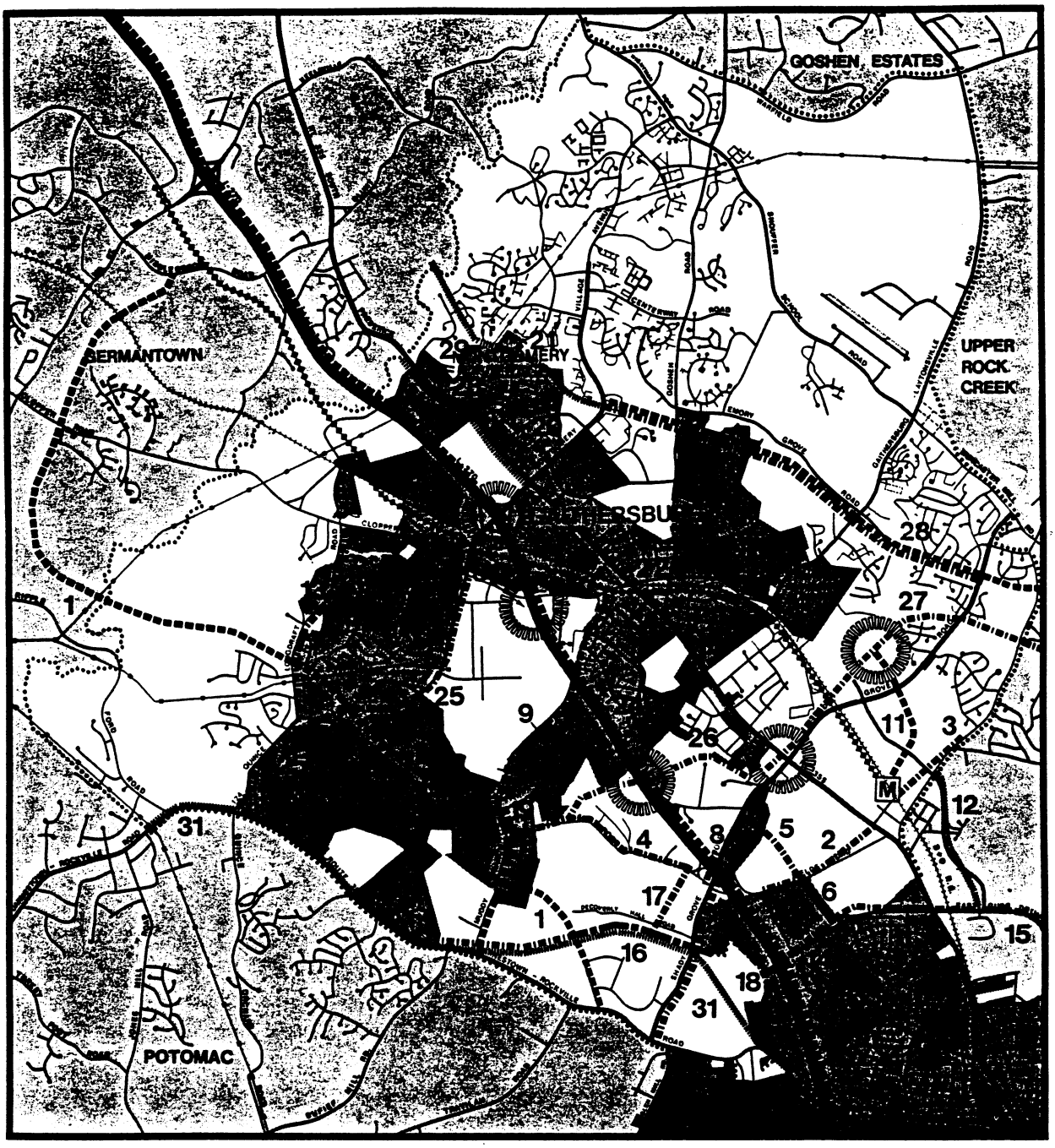
The improvements to the Shady Grove Road interchange are closely related to a series of other programmed roadway improvements designed to upgrade the road network surrounding the interchange. These improvements include:

(1) The widening of Shady Grove Road from four to six lanes between I-270 and Briardale Road;

(2) The construction of a three-lane bridge paralleling the existing Shady Grove Road Bridge over I-270;

(3) The upgrading of Fields Road between Piccard Drive and MD 355;

(4) The completion of Gaither Road between Shady Grove Road and Fields Road;



SELECTED ROADWAY IMPROVEMENTS

- PLANNING AREA BOUNDARY
- MUNICIPALITIES
- UNDER CONSTRUCTION
- PROGRAMMED
- PROJECT PLANNING
- MASTER PLANNED
- TRANSIT EASEMENT

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TABLE B

STATUS OF SELECTED ROADWAY IMPROVEMENTS

Map No.	County Projects	Under Construction	Programmed[1]	Project Planning	Master Plan	Number of Lanes Existing	Number of Lanes Ultimate
1	Great Seneca Highway: Middlebrook Road to MD 28[2]			X		0	4-6
2	Fields Road: Piccard Drive to MD 355		X			2	4
3	Fields Road-Redland Road: West of B&O Railroad to Needwood Road		X			2	4
4	Fields Road: Muddy Branch Road to Omega Drive		X			2	4
5	Gaither Road: End of existing paving, east of Shady Grove Road to Fields Road		X			0	4
6	Gaither Road: Fields Road to Gude Drive				X	0	4
7	Shady Grove Road: Corporate Court to MD 28		X			4	6
8	Shady Grove Road: Second bridge over I-270 and Interchange		X			0	3
9	Muddy Branch Road: MD 28 to MD 117		X			2	4-6
10	Midcounty Highway (Eastern Arterial): Shady Grove Road to Montgomery Village Avenue (2 lanes by Montgomery County)[3]		X			0	4-6
11	Crabbs Branch Way: End of existing paving south of Shady Grove Road to Redland Road	X				0	4
12	Crabbs Branch Way: End of Existing paving south of Redland Road to Gude Drive[4]				X	0	4
13	Longdraft Road: Quince Orchard Road to Clopper Road (portion of project through Great Seneca Park completed)		X			2	4
14	Gude Drive: Research Boulevard to MD 355 (County participation with city of Rockville)		X			0-2	4-6
15	Gude Drive: MD 355 to Southlawn Lane (adding the southerly 2 lanes)		X			2	4-6
16	Key West Avenue: Shady Grove Road to MD 28[5]	X	X			0	4-6
17	Omega Drive: Fields Road to Key West Avenue		X			0	4
18	Research Boulevard: Connection between existing northern and southern sections (city of Rockville)		X			0	4

Map No.	City of Gaithersburg Projects	Under Construction	Programmed[6]	Project Planning	Master Plan	Number of Lanes Existing	Number of Lanes Ultimate
19	Muddy Branch Road: Street reconstruction (participation with Montgomery County	X				2	6
20	Russell Avenue: Montgomery Village Avenue to Watkins Mill Road		X			0	4
21	Watkins Mill Road: Planning and engineering design and construction at existing bridge near MD 355		X			0	4

TABLE B (Cont'd.)

Map No.	State Projects	Under Construction	Programmed[7]	Project Planning	Master Plan	Number of Lanes Existing	Number of Lanes Ultimate
22	MD 355: South Summit Avenue to Chestnut Street		X			4	6
23	MD 355: Montgomery Village Avenue to Great Seneca Park				X	2	6
24	I-270 Improvements: Great Seneca Park to city of Rockville			X		6	8
25	Quince Orchard Road (MD 124): MD 28 to MD 117 (County and developer participation)[7]		X			2-4	4-6
26	I-370: Fields Road to Metro Access Road		X			0	6
27	Intercounty Connector: I-370 to Redland Road			X		0	6
28	Midcounty Highway (Eastern Arterial): Redland Road to Montgomery Village Avenue[8]			X		0	4-6
29	Midcounty Highway: Montgomery Village Avenue to Great Seneca State Park				X	0	4-6
30	I-270/MD 124 Interchange		X				
31	MD 28: I-270 to western edge of Planning Area				X	2	4

1 Programmed in the Adopted Montgomery County FY 84-89 Capital Improvements Program.

2 See attached project planning alternatives.

3 Two lanes by the County.

4 Partially constructed by developer.

5 Partially constructed.

6 Programmed in the city of Gaithersburgs FY 83-88 Capital Improvements Budget.

7 Programmed in the 1983-1988 State Consolidated Transportation Program, (SCTP).

8 Four lanes by the State.

(5) The reconstruction of Fields Road between Muddy Branch Road and Shady Grove Road; and

(6) The construction of Omega Drive between Fields Road and Key West Avenue.

MD 355

The widening of MD 355 (Frederick Avenue) between Shady Grove Road and South Summit Avenue and between Chestnut Street and Montgomery Village Avenue is now complete.

The MDDOT has programmed the next project, from South Summit Avenue north to Chestnut Street, to include the replacement of the narrow two-lane bridge over the B&O Railroad. This project will not be completed prior to the 1984 opening of Metro.

Midcounty Highway (Eastern Arterial)

The County, in its CIP, has programmed the construction of a two-lane roadway in the Eastern Arterial alignment between Montgomery Village Avenue and Shady Grove Road. This roadway, named the Midcounty Highway, although not expected to be completed by the time the Shady Grove Metro station is opened, will be a key element in providing access to the station from the northern and eastern sections of the Gaithersburg area. This roadway will be a realignment of MD 115.

Great Seneca Highway (Western Arterial)

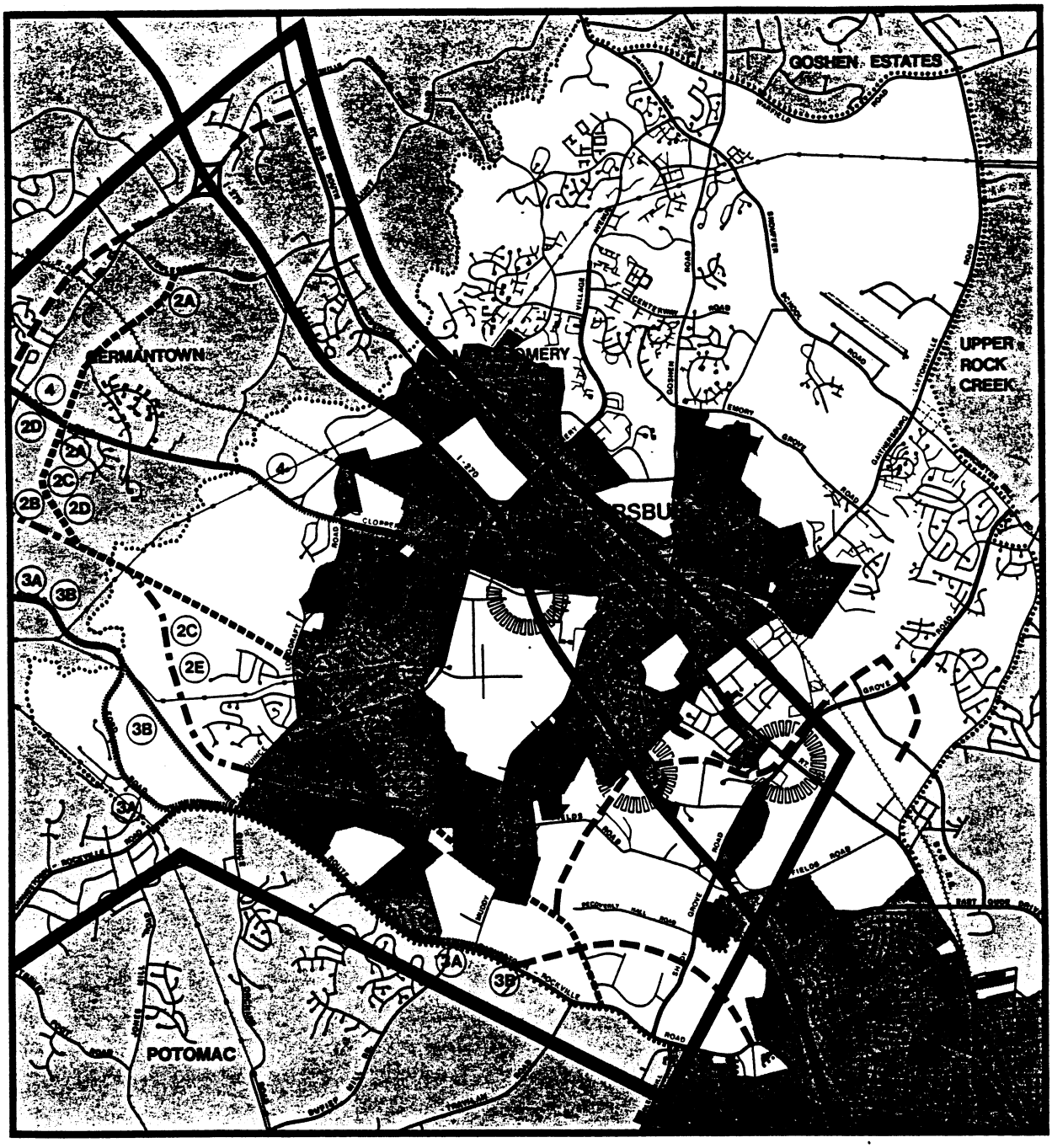
Funds for the construction of Great Seneca Highway are in the current CIP and are presently in the project planning stage. This roadway is needed to provide parallel access to I-270 and will accommodate traffic from the continued residential and employment growth on the west side of the I-270 Corridor. Thirteen residential subdivisions containing 7,214 dwelling units have been approved based on this roadway being in the CIP. The alignments currently contained in the project planning study are shown on page 11.

Quince Orchard Road (MD 124)

Quince Orchard Road is programmed for upgrading between Clopper Road (MD 117) and MD 28 to provide additional capacity and relieve safety problems. The adjacent portion of the city of Gaithersburg has experienced considerable residential and employment growth. Also, the proposed General Electric Information Services Company (GEISCO) office complex will be located adjacent to Quince Orchard Road. This roadway improvement will be a joint effort by the state, the County, the city, and GEISCO.

Muddy Branch Road

Muddy Branch Road is programmed for improvement and realignment between MD 28 and MD 117. The Federal Highway Administration recently gave location approval for the alternative which corresponds to the Master Plan location. Developers of subdivisions in the city of Gaithersburg will construct portions of the roadway adjacent to their properties.



GREAT SENECA HIGHWAY ALIGNMENTS

- PLANNING AREA BOUNDARY
- MUNICIPALITIES
- LIMIT OF GREAT SENECA HIGHWAY STUDY AREA
- MASTER PLAN ALIGNMENT (2A)
- MODIFICATIONS TO MASTER PLAN ALIGNMENT (2B, 2C, 2D)
- WIDENING OF EXISTING ROADS (ALTERNATES 3A, 3B, 4)
- OTHER MAJOR ROADS PROPOSED IN STUDY AREA

NOTE: ALIGNMENTS SHOWN ARE APPROXIMATE

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Future Transportation Directions

A critical issue that was raised by citizens of the Gaithersburg area is whether new highways are needed in light of the current energy situation. Local and national evidence, as well as the widespread professional judgement of transportation planners, indicates that the need for highway improvements will not be lessened to any significant degree by short-term energy shortages or the long-term national response to the energy problem.

After an analysis of the cost and availability of gasoline, it was concluded that there will be a continuing demand for vehicular trips. In particular, this analysis indicates that:

(1) Peak hour work trips will be least impacted by the energy situation and ultimately, it is these trips that determine the need for highway capacity;

(2) Increased cost of energy will be offset by the mandated and market trend to more energy-efficient cars;

(3) The ability of transit to increase its ridership due to energy shortages and price increases is limited by its capacity, routes, and frequency of service. Overall, there is no decrease in the need for road improvements such as I-370 (which will provide improved vehicular access to the Metro station and Midcounty Highway); and

(4) Existing population and potential growth create the need for both road improvements and transit opportunities.

We learned at least four lessons from analyzing the two energy crises and the recent non-crisis years. During the 1973/1974 energy crisis, one basic public response was to reduce discretionary travel (such as shopping and social trips) to a significantly greater degree than to reduce automobile travel for work-related purposes. This resulted in a larger percentage decrease in daily travel rather than peak period travel. The United States Department of Transportation's news releases on national traffic trends showed that there was a similar response to the most recent gasoline shortage in 1979. Given this observation, we concluded that while short-term responses to energy shortages would decrease in Average Daily Trips (ADT), the peak hour requirements would still require the full capacity forecasted for roadway improvements.

A second lesson learned was that the major factor causing people to change their transportation behavior was gasoline availability, not cost. It is the "hassle factor" and the uncertainty of getting any gasoline that causes people to reconsider where, when, and how they travel, or whether to travel at all. The major price changes for gasoline in 1973/1974 and 1979, by themselves, have had marginal impact on increasing conservation or in getting people to ride transit or to carpool. During the period 1974-1979, while the nominal price of gasoline increased somewhat, the cost in constant dollars declined relative to the Consumer Price Index (CPI). This had the effect of continuing the historic trend of having cheap energy available for personal transportation, while at the same time was counter-productive to fostering greater utilization of transit.

Another response to the energy situation was a marked switch to more energy-efficient cars. To some degree, this has been interdependent with national policy efforts and with specific legislation requiring new cars to average 27 miles per gallon by 1985.

The net effect in the short and long term will be that people will drive more energy-efficient cars, thereby keeping travel demand high while conserving gasoline at the same time.

A final lesson learned, in part from these energy shortages, was that people who wished to shift their travel to transit were limited by the capacity of the transit system, especially in the peak period. The general response in the Washington metropolitan area and in many other metropolitan areas in 1973-74 was that transit ridership increased by about 10 percent. The ridership statistics, both locally and nationally in 1979, showed short-term ridership gains on transit on the order of 20 percent. The number of bus trips and frequency of service on many of the major routes provided by the various transit authorities generally have a very direct relationship to the "normal" transit ridership. Most service standards are such that the amount of peak period service which is provided allows for a certain percentage of standees, often as high as 40 percent, before additional bus services are added. Consequently, most transit services have little slack capacity to handle short-term ridership increases, especially during the peak periods.

HIGHWAY ALIGNMENTS

The Plan recommends changing the alignment of several of the major highways from those on the 1971 Master Plan. The proposed realignment of Quince Orchard Road (MD 124) has been previously changed from that shown on the 1971 Master Plan. Some changes recommended in this Plan reflect changes within the city of Gaithersburg, some are based on recommended changes in land use, and some are made due to a more detailed study of the individual highway alignments through this planning process.

In the Airpark Area, proposed changes in the alignments of M-21 and A-267 reflect the changes made by the city of Gaithersburg in its subdivision approvals in that area. The alignment of Oden'hal Avenue was also changed to provide a safer intersection with Goshen Road. The development plan for Montgomery Village has been amended to reflect this change.

In the Shady Grove West area, there is a number of proposed changes in road alignments. These changes respond to changes in land use, the identification of potential historic sites, and to the policy of protecting stream valleys. These alignments are subject to change during the subdivision process or as a result of the project planning studies now underway on several of the roadways in the area.

The recommended alignment of I-370 between I-270 and MD 355 has changed as a result of the project planning study on that highway. The alignment recommended by this Plan avoids the apartment buildings built in the alignment shown on the 1971 Master Plan. The alignment passes closer to the Rosemont subdivision and north of the cul-de-sac of Industrial Drive. Thus, less residual land is left north of the I-370 alignment.

The recommended alignment of Key West Avenue Extended south of Shady Grove Road is also changed from that in the 1971 Master Plan. It passes to the east of a parcel of land in the Thomas Farm District located in the Shady Grove West area, rather than passing through its center.

The proposed interchange at Muddy Branch Road/I-270 and the link of I-370 between Great Seneca Highway and MD 28 shown in the 1971 Master Plan are deleted from this Plan. The Muddy Branch Road interchange has been deleted because it does not meet

current federal standards for distances between interchanges. The I-370 link between MD 28 and Great Seneca Highway has been determined to be unnecessary as other planned roadways are sufficient to carry the projected traffic.

B. OVERVIEW OF TRAFFIC FORECAST MODEL

Traffic forecasts are an integral part of the planning process. Traffic forecasts are projections of traffic volume on existing and future roadways based on future land uses. Forecasts for the major roadways in the Gaithersburg area reflect the land uses proposed in this Plan.

The overall approach for developing traffic projections for the Gaithersburg area follows the technique developed by the MDDOT for the I-370 project planning study. This approach starts with region-wide traffic volumes which are then "broken down" into smaller sub-areas.

Aggregate traffic volumes for the region were obtained from the Metropolitan Washington Council of Governments (COG) regional traffic simulation model, TRIMS (Transportation Integrated Model System). These overall traffic volumes assume various roadway improvements and reflect regional forecasts of household and employment growth. These overall traffic volumes were then broken-down by smaller sub-zones (see map on page15) according to the amount of employment and residential activity forecast for the sub-zones. There are 86 internal and 24 external sub-zones in the Gaithersburg Vicinity Master Plan Area. (For comparison, the I-370 project planning study area has 42 internal sub-zones and 18 external sub-zones).

The traffic capacity of major master planned roadways was then estimated. A list ofthe key roads incorporated in the model and the number of lanes assumed is shown in Table B . The traffic forecasts are based upon I-270 as an 8-lane freeway and the Intercounty Connector. A series of alternate paths was then established for traffic movements between the 110 traffic sub-zones. Approximately 8,000 individual trip paths were developed for the Gaithersburg Vicinity Area. The number of trips between each of the 110 traffic sub-zones was determined to develop a sub-zone trip table. (See the detailed discussion below.) Those trips were then assigned to the corresponding path between the zones, and the traffic volumes were accumulated by the computer.

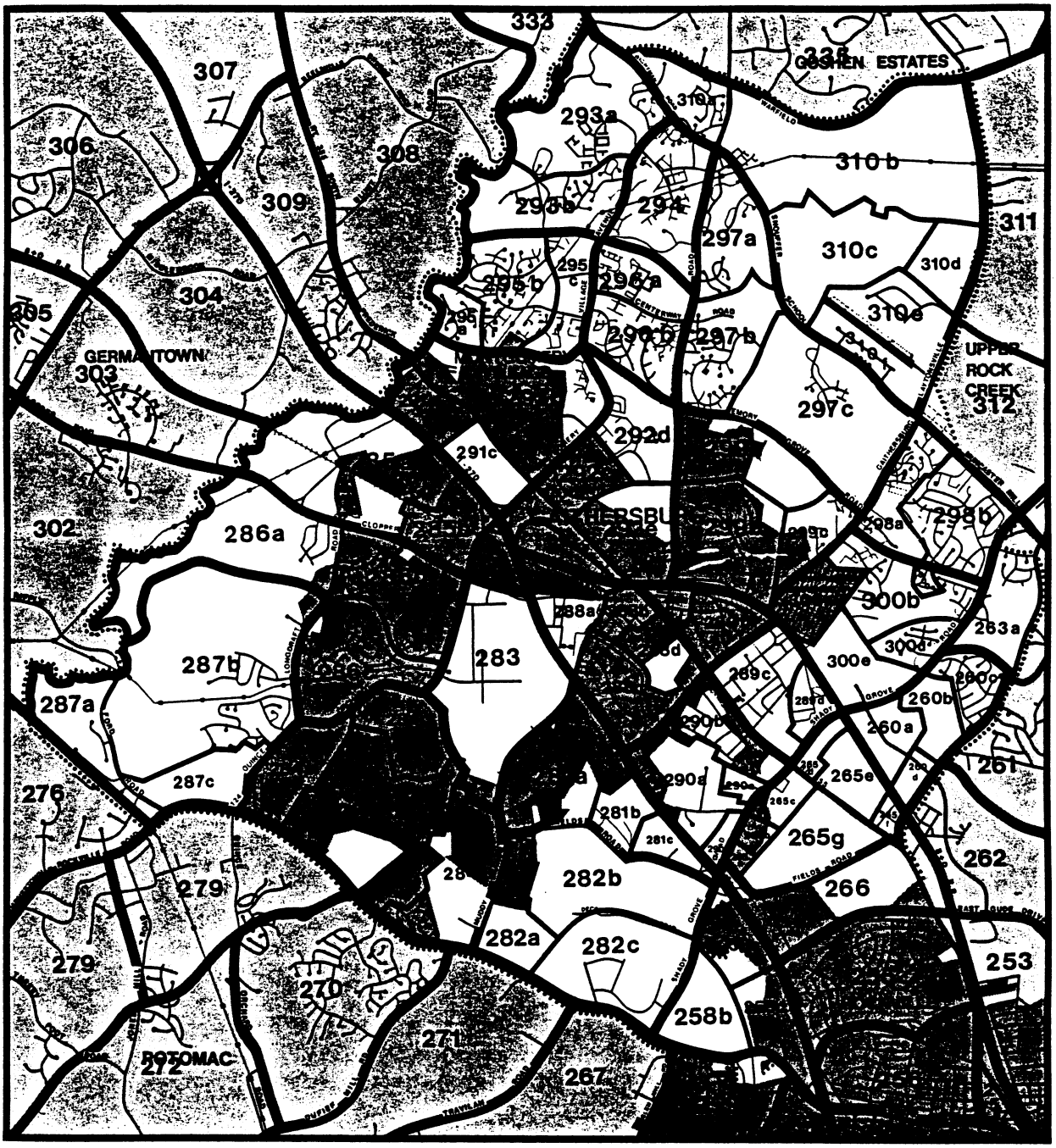
An analysis was carried out to see if the capacity of each of the various paths was exceeded. "Hand adjustments" were made to those paths which had volumes in excess of that particular route's capacity. This adjustment diverted trips to alternate paths with available capacity. If the available capacity on the alternate paths was still exceeded by the projected traffic volumes after adjustment, then additional roadway improvements or modifications of the area land use recommendations were made to the Plan. This process is detailed further below.

Specific Procedure for Trip Table Generation

The following procedures were taken for developing the sub-zone trip table:

Step 1 Obtain district level trip table for Designated Year (DY) from COG. Obtain district level land use forecasts for DY for households and employment.

Step 2 Set up equivalency list between COG district and sub-zones level.



TRAFFIC ANALYSIS ZONES

- PLANNING AREA BOUNDARY
- MUNICIPALITIES
- TRAFFIC ZONE BOUNDARY
- TRAFFIC ZONE SUB-AREA BOUNDARY

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Step 3 Determine land use projections for employment and households at the sub-zone level.

Step 4 Develop internal-to-internal sub-zone trip table.

4a) Divide district P-A trip table in half because

$$\tfrac{1}{2}(P\text{-}A) + \tfrac{1}{2}(P\text{-}A)^{T} = O\text{-}D$$

Where: P-A: Production - Attraction
O-D: Origin - Destination
T: Transpose

4b) Divide Land Use projections for zones by Land Use projections for districts to get "Percent Land Use for each zone within the district." Do this step separately for households and employment.

4c) Multiply the ½ (P-A) district trip table by the "Percent Land Use for each zone with the district." For each zone-to-zone pair, the corresponding district trips are multiplied by the percent of households, then the percent of employment land uses for those two zones within the corresponding district.

4d) Take the transpose of this new zone-to-zone trip table.

4e) Add new trip table to transpose to arrive at the final internal-to-internal zone trip table.

Step 5 Develop external-to-internal trip table

5a) Identify COG node number/links corresponding to externals at zone level.

5b) Using Select Link Data from COG TRIMS runs, determine the number of trips on each external link destined to/originating from zones internal to the study area.

5c) From Lane Use projections for zones develop the "Percent Land Use for each zone within the COG zones." Multiply households in each zone by 10, employees in each zone by 5 and sum together. Then divide these numbers for each zone by the total for the COG zone.

5d) Multiply these "Percentages of Land Use projections for zones" by the number of trips to each COG zone to determine the number of trips to each zone.

5e) Reverse table to get internal-to-external trip table.

Step 6 Develop external-to-external trip table.

6a) Follow steps (5a) and (5b), except find the number of trips to external COG zones instead of internal COG zones.

6b) For each external COG zone, estimate the percentage of trips traveling through the Study Area using each pair external links to access the external COG zone.

6c) Multiply percent trips using external link pairs times the number of trips destined/originating from the external COG zone.

6d) Sum up the total number of trips using each external link pair.

6e) Take half of the external to external trip table.

6f) Take the transpose of the table resulting from Step (6e).

6g) Sum the transpose trip table (Step 6f) to the non-transpose (Step 6e) to obtain final trip table for external-to-external trips.

Assumed Roadway Capacity and Screening Criteria

The following ADT volumes were used as the assumed roadway capacity for the different roadway classification in the Gaithersburg Vicinity Master Plan. These ADT volumes are the base service volumes at LOS "D", conditions of unstable flow, of the Highway Capacity Manual.

Daily Roadway Service Volumes Used in the Plan

Number of Lanes	With No Left Turn Lanes	With Left Turn Lanes	Divided Roadway	Freeways
2	10,000	13,000	-	-
4	21,000	27,000	30,000	54,000
6	33,750	42,000	47,000	82,500
8	46,000	54,000	60,000	105,000

Most of the daily traffic volumes projected for the Gaithersburg area assumed full land use development and master planned roadways were less than these base service volumes shown in the above table. However, certain roadways such as Muncaster Mill Road and Fields Road have projected traffic volumes which exceed these service volumes. In reviewing these conditions, the following two criteria were used:

1) If the projected traffic volume on a link exceeded 25 to 50 percent over the daily roadway service volume, then careful review was given to the land use recommendations to see if modifications on the land use could be made which would have resulted in less impact; and

2) If the projected volume exceeded 50 percent over the daily roadway service volume, then reduction of the impacted area's development intensity was made or additional roadway improvements were recommended by the Plan to lower the projected volume less than 50 percent.

The above criteria were developed in reviewing the service volume at LOS "E", conditions of unstable flow, of the Highway Capacity Manual and the midpoint LOS "E" concept used in the CPP. Since the service volumes at LOS "D" were used as the assumed roadway capacity in the Gaithersburg Plan, use of the above criteria was necessary to review the reasonably allowable traffic conditions consistent with the CPP. For a comparison of daily roadway service volumes used in the Gaithersburg Vicinity Master Plan and in the CPP Transportation Model, the following table was developed to show the ADT volumes 50 percent over service volume at LOS "D" used in the Gaithersburg Vicinity Plan and the ADT volumes at midpoint LOS "E" used in the CPP.

Comparison of ADT Volumes Used in the Gaithersburg Vicinity Plan and CPP

Number of Lanes	With No Left Turn Lanes		With Left Turn Lanes		Divided Roadways		Freeways	
	Plan	CPP	Plan	CPP	Plan	CPP	Plan	CPP
2	16,970	15,000	N/A	19,500	-	-	-	-
4	33,200	31,500	41,200	40,500	44,640	45,000	77,750	81,000
6	N/A	50,625	N/A	63,000	67,000	70,500	116,650	123,750
8	N/A	69,000	N/A	81,000	N/A	90,000	155,500	157,500

As shown in the above table, the criteria of 50 percent over service volume at LOS "D" used in the plan is generally equivalent to the criteria of the midpoint LOS "E" ADT volumes used in the CPP. Also a review of observed traffic in the Montgomery County roadways reveals daily traffic volumes higher than 50 percent over the service volume at LOS"D" used in the plans for comparable roadways. Therefore, the analytical approach and the criteria being used in the Plan for balancing roadway capacity and land uses for the Plan is fair and reasonable.

It has been a general practice to review the ADT volumes at roadway links in this size of master plan analysis than the peak hour volumes at intersection level. The traffic demand forecast on the roadway link is considered as more reasonable analytical approach in the master plan analysis since the finer intersection-level traffic analysis can be done at a later stage during the development review process.

C. HOUSING

A principal planning and development objective of the Gaithersburg Vicinity Plan is to provide the opportunity for people to live and work in the same community. This can be achieved by:

- Providing a wide range of housing of various types, sizes, and price ranges for a representative cross section of the community;

- Providing adequate, suitable land for housing development in close proximity or readily accessible to employment opportunities; and

- Providing housing and supporting retail and service facilities that are compatible with existing communities.

During the past two decades, the Gaithersburg area emerged as the fastest growing section of the County. Located within the I-270 Corridor, it serves as a major receiving area for the County's continuing suburban growth. Appropriate zoning regulations, large tracts of land suitable for development, and adequate urban infrastructure (existing and programmed) have stimulated production of reasonably priced housing, especially attractive to first-time homebuyers. The area has also benefited from substantial industrial development, much of it being high technology firms representing the vanguard of new American economic growth. These firms provide numerous job opportunities for the Gaithersburg area's resident and future population.

The rapid pace of the Gaithersburg area's growth has slowed during the last two years, essentially due to the current economic recession and to the widened inability of households to afford new housing. The latter, aside from inflation-fed prices for new housing, has been caused by sharp rises in mortgage interest rates, substantially raising monthly carrying costs for prospective homebuyers. Most recent mortgage rate reductions have spurred an upturn in area homebuilding activity, and the Gaithersburg area is once again expected to lead the County's new housing production gains.

To meet the existing needs for affordable housing in the County and also to provide housing for employment gains in the I-270 Corridor, the Plan encourages the development of more affordable housing, represented by townhouses and condominiums. The Plan further encourages that public facilities needed to serve new residential development be provided in a staged, orderly fashion.

Population and Housing Trends

Between 1950 and 1970, Montgomery County's population grew from 164,401 to 522,810. Population growth during the 1970's, however, fell substantially to an average annual rate of only 5,600, less than one-third the annual rate of the previous two decades.

Contrary to the general County experience, population in the Gaithersburg market area during 1970-80 increased from 22,100 to 61,667, reflecting a 179 percent growth, as compared to a 10.8 percent growth for the entire County. (See Tables C and D.) The I-270 Corridor, of which Gaithersburg is the largest component, emerged as the County's major growth area.

As indicated previously, the Gaithersburg area has provided an abundance of sites for new, moderate-cost housing. Not only has the area served to house employees of the new employment centers in the I-270 Corridor, but it has also provided a major avenue for the County's on-going suburban growth. During the 1970-80 period, the Gaithersburg area captured 70 percent of the total County population increase. This substantial capture resulted not only from the nearly 40,000 population gain within the Gaithersburg area but, equally important, from the large scale population losses which occurred within the County's inner-suburban ring, represented by such areas as Bethesda, Silver Spring, and Wheaton.

During 1970-80, the Gaithersburg housing inventory grew from 7,114 units to 22,824 (a gain of 15,710 units), representing an annual average increase of nearly 1,600 units.

TABLE C

POPULATION IN GAITHERSBURG AREA
AS COMPARED TO MONTGOMERY COUNTY: 1960-80

	1960 Population	1970 Population	1980 Population
Montgomery County	340,300	522,810	579,053
Gaithersburg Area	7,600	22,100	61,667
Percent Market Area to County	2.2%	4.2%	10.7%

Source: 1960, 1970, and 1980 U.S. Census of Population.

TABLE D

TRENDS IN POPULATION GROWTH FOR THE GAITHERSBURG AREA
AS COMPARED TO MONTGOMERY COUNTY: 1960-80

	Increase in Population		
	1960-70 Population	1970-80 Population	1960-80 Population
Montgomery County			
Number	181,510	56,243	238,044
Percent Increase	53.6%	10.8%	70.2%
Gaithersburg Market Area			
Number	14,500	39,566	54,066
Percent Increase	190.8%	179.0%	711.3%
Percent of County Increase	8%	70.4%	22.7%

Source: 1960, 1970, and 1980 U.S. Census of Population.

This gain represents nearly 35 percent of the total 1970-80 inventory gain for the entire County. During the previous decade of the 1960's, the Gaithersburg area housing increase amounted to only 6.1 percent of the total County housing inventory gain.

Housing gains for the Gaithersburg area and for the entire County during the 1970's were irregular in pace, primarily reflecting the adverse impacts of the 1973-75 recession. During 1974-75; building permit activity for the entire County dropped below 2,000 units a year. This low-point of permit activity is compared to 1971-72, when County building permit activity amounted to over 10,000 units annually. Residential building permit activity in the County rose steadily after 1975, and the Gaithersburg area homebuilding activity reasserted itself by claiming an increasing share of total County activity.

During 1970-74, the Gaithersburg share of total County housing construction amounted to 32 percent; during 1974-78, the Gaithersburg share increased to 41 percent. During 1980-81, however, the Gaithersburg area completions diminished to 33 percent of total County activity. This reduction did not reflect declines in Gaithersburg production levels; rather, the decrease was due to increased production in other parts of the County, notably within the Fairland/White Oak Area.

Changes in Population Characteristics

The most outstanding demographic change in Montgomery County has been the substantial decrease in average household size, which fell from 3.65 persons in 1960 to 3.30 person in 1970, and to only 2.77 persons in 1980. Although County population increased by only 10.8 percent during the 1970's, household growth increased nearly threefold over population, by 32.2 percent.

Reduced average household size has resulted from a number of demographic dynamics. These include an increasing incidence of "empty nest" households among those over 50 years of age (the near-elderly), an increasing incidence of smaller, non-family households, postponement of childbearing, and residual households comprising widows, widowers, and those divorced. Perhaps the largest single dynamic has been the very large increase in the number of single person households. In 1970, single person households constituted 13.5 percent of dwelling unit residents; by 1980, the percentage had increased to 21.0 percent. This is a proportional increase of 55.6 percent over the 10-year period.

In 1980, the Gaithersburg area contained 22,824 dwellings, of which 51 percent were multi-family rentals (principally garden and high-rise apartments), and condominium units. This percentage was substantially higher than the total County share of multi-family units, which was 33 percent.

The median age of residents in the Gaithersburg area is 26.4 years, considerably lower than the County-wide median of 32.1, indicating that the area has been serving as a major receiving area for new suburban growth which attracts large numbers of first-time homebuyers and new household seeking moderate-price rentals. (See Table E.) There is also a higher percentage of population under 10 years of age, indicating the presence of younger families with children. This age profile is consistent with the presence of larger than average household sizes among homeowners in the Gaithersburg area. Parallel with this is the substantially lower proportion of persons aged 55 and over. All of the foregoing, as suggested earlier, describe Gaithersburg fulfilling a typically suburban

TABLE E

PERCENTAGE DISTRIBUTION BY AGE, 1980 POPULATION, GAITHERSBURG AREA AND MONTGOMERY COUNTY

Age Group	Montgomery County (Percent)	Gaithersburg Area (Percent)
0 - 4	5.8	8.5
5 - 9	6.6	8.0
10 - 14	8.5	8.5
15 - 19	8.8	7.8
20 - 24	8.0	10.2
25 - 34	17.4	25.1
35 - 44	14.1	14.5
45 - 54	11.9	8.3
55 - 64	10.1	4.8
65 & over	8.8	4.3
Total	100.0	100.0
Median Age	32.1	26.4
Percent Population under 20	29.7	32.8
Percent Population 55 & over	18.9	9.1

Source: 1980 Census; unpublished tabulation of Research Division, MCPB.

Note: Montgomery percentages based on total population; Gaithersburg on household population. Only 287 persons in Gaithersburg in group quarters, as compared to nearly 62,000 household population.

growth function, i.e., attracting many first-time homebuyers and renters, particularly those with young children or who are ready to start childbearing.

Effects of Increases in Housing Prices and Interest Rates

National housing statistics have described a steady rise in the cost of new and existing housing. Between 1971 and 1981, the median price of a new house in the United States rose from $25,200 to $68,900, and from $24,800 to $66,400 for existing houses. For new houses, the percentage increase during the 10-year period amounted to 173 percent, and for existing homes, 168 percent. During that same period, the CPI for the nation increased by 124.5 percent. Median prices for new housing, therefore, rose 40 percent more rapidly than costs of all consumer items. This price rise differential, in itself, has contributed to widening the affordability gap, i.e., the decreasing proportion of householders who can afford a median-priced house.

The affordability gap takes on additional dimensions in the Washington metropolitan area market because of its higher housing prices, as compared to housing prices in other major metropolitan area markets. During the first quarter of 1982, according to the National Association of Homebuilders (NAHB), which cites data collected by the Federal Home Loan Bank Board (FHLBB), the average cost of new and existing houses financed in the Washington metropolitan area was $123,400, as compared to a corresponding average of $90,700 for all of the 32 metropolitan markets that the FHLBB surveyed.

Two reservations are required with regard to the Washington metropolitan area's housing market. Washington area household incomes are higher than in many other of the nation's housing markets, and this tends to offset the higher price levels. Also, the Gaithersburg area has been characterized by more modest housing prices which have been achieved through the high proportion of townhouse development.

During the last several years, however, the most critical factor for widening the affordability gap has been the high levels of mortgage interest rates. In November 1981, Washington area rates had peaked at approximately 18 percent. More recently, as the result of the current recession and a diminished demand for credit from business, industry, and consumers, the prevailing mortgage interest rates have dropped substantially. Prevailing conventional (non-FHA and VA) interest rates dropped to approximately 13.2-13.5 percent by February 1983.

The NAHB has estimated (based upon its analytical model, which presumes a new home purchase with a $60,000, 30-year term, 13.5 percent interest mortgage) that less than 15 percent of the nation's households can afford to buy a home on the basis of paying one-fourth of income for housing expenses, which includes principal and interest mortgage payments, real estate taxes, hazard insurance, and utilities. The affordability percentage rises to about 27 percent on the basis of payment of one-third of household income for these housing costs.

Studies by the Research and Special Projects Division, Montgomery County Planning Board suggest that prospective homebuyers are somewhat economically better off than those for the nation as a whole. On the basis of a $77,000, 14 percent, 30-year term mortgage for a $102,500 home, it is estimated that approximately 22 percent of County households could purchase a home on the basis of paying one-fourth of income for housing costs.

TABLE F

DWELLING UNITS AND POPULATION
GAITHERSBURG AREA AND MONTGOMERY COUNTY
1970, 1980, 1985, 1990

	1970	1980	1985	1990
Gaithersburg Area				
Dwelling Units	7,114	22,824	28,024	32,774
Population	22,101	61,667	73,700	82,500
Montgomery County				
Dwelling Units	161,303	206,793	226,893	249,393
Population	522,810	579,053	587,000	622,000

Source: U.S. Census and also Research and Special Projects Division, Montgomery County Planning Board; 1985 and 1990 estimates are "high scenario" computations, based upon higher rates of population and housing gains.

TABLE G

DWELLING UNITS AND POPULATION INCREASES
GAITHERSBURG AREA AND MONTGOMERY COUNTY
1970-80, 1980-85, 1985-90

	1970-80	1980-85	1985-90
Gaithersburg Area			
Dwelling Units	15,710	5,200	4,750
Population	39,566	12,033	8,800
Montgomery County			
Dwelling Units	45,490	20,100	22,500
Population	56,243	7,947	35,000
Gaithersburg as a Percent of County			
Dwelling Units	34.6%	25.9%	21.1%
Population	70.3%	151.4%	25.2%

Source: U.S. Census and also Research and Special Projects Division, Montgomery County Planning Board; 1985 and 1990 estimates are "high scenario" computations, based upon higher rates of population and housing gains.

Future Projections

The continued expansion of employment opportunities in the I-270 Corridor and availability of land for new residential construction will continue to support population and housing increases in the Gaithersburg area. Several major employers have recently established new facilities in the I-270 Corridor or have announced intentions to do so. Among these are GEISCO, Digital Communications Corporation, and the Bendix Corporation. Increases in retail and service jobs will run parallel to the Gaithersburg area's population growth.

In-migration of new residents, as contrasted to natural increases of current residents, is expected to be the major source of the Gaithersburg area's population growth. During the 1970's, almost 70 percent of its population increase was the result of in-migration of new residents. Population is expected to increase by nearly 21,000 persons between 1980-90. During the same period, the housing inventory is expected to grow by nearly 10,000 units; most will serve in-migrant households. (See Tables F and G.)

For the Gaithersburg area, the forecasted population growth between 1980-90 suggests an increase of 34 percent. Housing unit (household) growth should register a 43 percent increase during the same period. The latter projection is derived from continuing decreases in average household size, a characteristic of maturing suburbs. During this period, the Gaithersburg area is expected to provide about 23 percent of the County's growth in housing stock, but 49 percent of the County's population growth. The substantially larger population share is attributable to a continuing declining population in the older, mature suburbs of the County, with a fairly static housing inventory and a continuing reduction in average household size in these areas.

The Gaithersburg area, as of 1982, had issued sewer authorizations to accommodate a total of nearly 12,000 dwelling units. This should readily accommodate the forecasted growth of 10,000 additional units. Thus, the Gaithersburg area should be able to continue to serve substantial portions of total County growth needs.

D. ECONOMIC DEVELOPMENT

The employment characteristics of the Gaithersburg area were first studied in 1978. (See Ten Year Market Analysis, 1978-1988, of the I-270 Market Area, Planning Board, Research Division.) This section summarizes this report and updates the Market Study on the basis of post-1978 changes and developments. The Gaithersburg Market Area includes the Gaithersburg area and a portion of the city of Rockville.

As described in the Housing section, the Gaithersburg area has developed during the last two decades into the fastest growing section of the County. To reiterate, during the 1970-1980 decade, the Gaithersburg area registered a 179 percent population growth, as compared to a 10.8 percent growth for the County. This accounted for 70 percent of the total County population increase. During the same period, dwelling unit production in the area constituted over one-third (35 percent) of total County housing growth. The much larger proportional population gain reflects substantial declines in down-County areas during the same period.

Paralleling the above residential growth has been the Gaithersburg area's rapid expansion in industrial and services/retail employment. The new area jobs have been

filled both by area residents and by commuters from elsewhere in or outside the Washington metropolitan area, with the latter notably from the Frederick County area.

Recent Trends in the Office Market

During the 1960's, several federal agencies and high technology firms elected to locate in the Gaithersburg area. This established the area's identity as a preferred site for such development. The National Bureau of Standards and IBM were in the vanguard, and others rapidly followed. The I-270 Corridor has, within a relatively short period of time, become a center for advanced technology industries, professional firms serving national and international markets, and federal agencies concerned with highly technical and advanced scientific programs and services.

Paralleling this development has been the rapid, large-scale suburban development of the Gaithersburg area. This consumer base of new suburban households has, in turn, attracted the professional, service, and retail functions that serve such development. These firms and professionals have been accommodated in an expanded inventory of office and retail space. Parallel warehouse development also has responded to the storage, distributive, retailing, and infant-industry development needs of the area. Table H shows the office, manufacturing and warehouse inventories, and retail employment in the Gaithersburg area in 1978 for each of five market sub-areas, shown on page 29 .

During the 1970's, other parts of the County and the Washington metropolitan area also attracted high-technology firms and establishments. Despite this competition, the Gaithersburg area continues to exercise great appeal for firms and installations that seek a high quality locational image.

The employment needs of new firms and businesses in the Gaithersburg area have been served by a highly educated and skilled labor pool. Shortages of skills and occupations will be filled, as they have been in the past, by in-migrants from elsewhere in the metropolitan area or from outside.

Industrial and commercial development in the Gaithersburg area have contributed to Montgomery County's increased ability to provide jobs for its residents. During the 1970-1980 decade, the proportion of County residents who both lived and worked in the County increased from 52 to 58 percent. This figure was even higher for the Gaithersburg area. A 1981 survey found that 74 percent of Gaithersburg area residents worked within the County, with 35 percent of those residents working within the Gaithersburg area itself.

Montgomery County has enjoyed a favorable employment position within the entire Washington metropolitan area economy. Its share (by place of employment) of total metropolitan area jobs grew from 15.6 percent in 1970 to 17.8 percent by 1980. The greatest growth in County-based jobs occurred in services, with 41 percent of total jobs gained between 1978 and 1980 occurring in that sector. Jobs in wholesale and retail trade grew by 16 percent during that same period. Governmental employment between 1978-1980 grew by 16 percent; this sector of employment, however, has been declining in the combined area of Montgomery-Prince George's-Charles Counties since 1980, according to the Maryland Department of Human Resources.

The 1978 report of the Montgomery County Economic Development Advisory Board, Montgomery County's Economy: Current Problems and Economic Development Potential,

identified several constraints to the growth of existing firms and the attraction of major new companies. Three of the major constraints identified were: inadequate transportation services, a climbing tax rate, and rising housing costs.

A subsequent report by the same Board, Initiatives for Economic Progress, (1979) focused upon prospective economic development in the Shady Grove Study Area. The following sets forth salient findings of that report:

> There is a serious lack of coordinated implementation planning for public facilities by local, state and federal government agencies to serve the public and to accommodate both public and private major developments.
>
> While our County is investing enormous resources into comprehensive planning, the net result is that some private development seeking approval for construction is now in jeopardy of being denied based on the County's Adequate Public Facilities Ordinance. These denials are due to deficiencies in public facilities which are not being built by the government in support of its own master plans.
>
> The Study Area includes property under the jurisdiction of Montgomery County and the cities of Rockville and Gaithersburg. Each of these political entities has different development policies and regulations. For example, a project which could not be constructed within the County's jurisdiction due to inadequate public facilities can be constructed in either of the two cities. This results in serious inconsistencies in government service to the public.

Clearly, if the Gaithersburg area's previous pace of economic development is to continue, the County must assure the timely provision of corollary facilities, especially, improved highway capacity to serve the I-270 Corridor.

Future Projections

The development potential of industrially-and office-zoned vacant land in Gaithersburg is estimated in Table I.

The Gaithersburg area continues to enjoy availability of vacant, industrially-zoned land. There are 1,662 acres of vacant land within the Gaithersburg Market Area which are available for office or industrial uses. The vast majority of this acreage is located in the Shady Grove Road area, on both sides of I-270.

Table J indicates by traffic zone (see map on page 31) the number of square feet of office and research and development facilities in the Shady Grove Road area that are existing, approved for development, currently proposed for review, and could be developed in the future. Projections of the number of employees have been made on an average of 250 square feet of floor area per employee. These figures describe where projects are in the development approval process, but do not indicate a time for their actual construction and completions.

TABLE H

EXISTING OFFICE, MANUFACTURING AND WAREHOUSE DEVELOPMENT
GAITHERSBURG MARKET AREA, 1978

Market Subareas	Square Feet	Estimated Employees
A	256,400	10,470
B	595,300	7,040
C	296,800	3,230
D	2,609,700	7,690
E	1,388,200	3,130
TOTAL	5,146,400	31,560

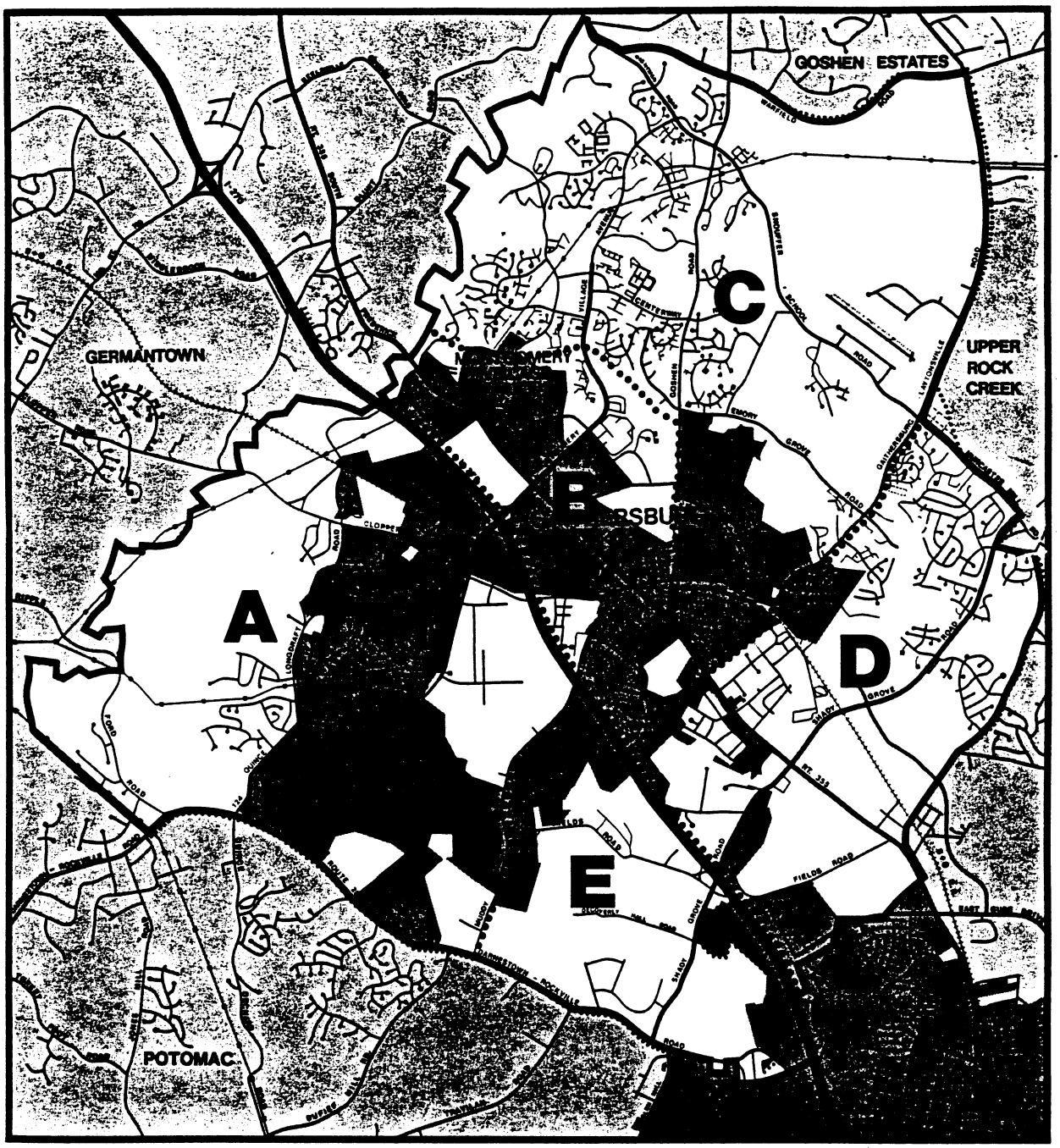
Source: Ten Year Market Analysis (1978-1988): I-270 Market Area, M-NCPPC, November 1980.

TABLE I

DEVELOPMENT POTENTIAL OF INDUSTRIALLY-AND OFFICE-ZONED
VACANT LAND (1978)
GAITHERSBURG MARKET AREA, 1978

Market Subareas	Acres	Square Feet	Estimated Employees
A	347.8	1,560,080	6,783
B	102.2	477,740	2,077
C	324.7	3,842,850	16,708
D	351.4	4,371,260	19,006
E	536.1	1,805,160	7,848
TOTAL	1,662.2	12,097,090	52,422

Source: Ten Year Market Analysis (1978-1988): I-270 Market Area, M-NCPPC, November 1980.



GAITHERSBURG MARKET AREA

····· PLANNING AREA BOUNDARY

▒▒▒ MUNICIPALITIES

• • • • • BOUNDARY OF MARKET SUBAREAS

GAITHERSBURG VICINITY MASTER PLAN —
Montgomery County, Maryland

Final Draft
SEPTEMBER, 1983

TABLE J

DEVELOPMENT POTENTIAL FOR OFFICE AND RESEARCH DEVELOPMENT FACILITIES
SHADY GROVE ROAD AREA (1981)

Traffic Zone	Existing Square Feet	Approved Square Feet	Proposed Square Feet	Future Square Feet
281	160,000	2,400	-	3,400,000
282	300,000	1,400,000	250,000	870,000
258	1,435,000	946,000	300,000	2,200,000
265	810,000	209,000	-	1,670,000
266	650,000	870,000	500,000	1,300,000
290	410,000	1,150,000	-	325,000
TOTAL	3,765,000	4,575,000	1,050,000	9,765,000
Employees	15,060	18,300	4,200	39,060

(Assumes 250 square feet per employee.)

Source: Montgomery County Planning Board staff estimates based on subdivision files, discussions with city of Rockville Planning Department staff and with area landowners and developers during 1981.

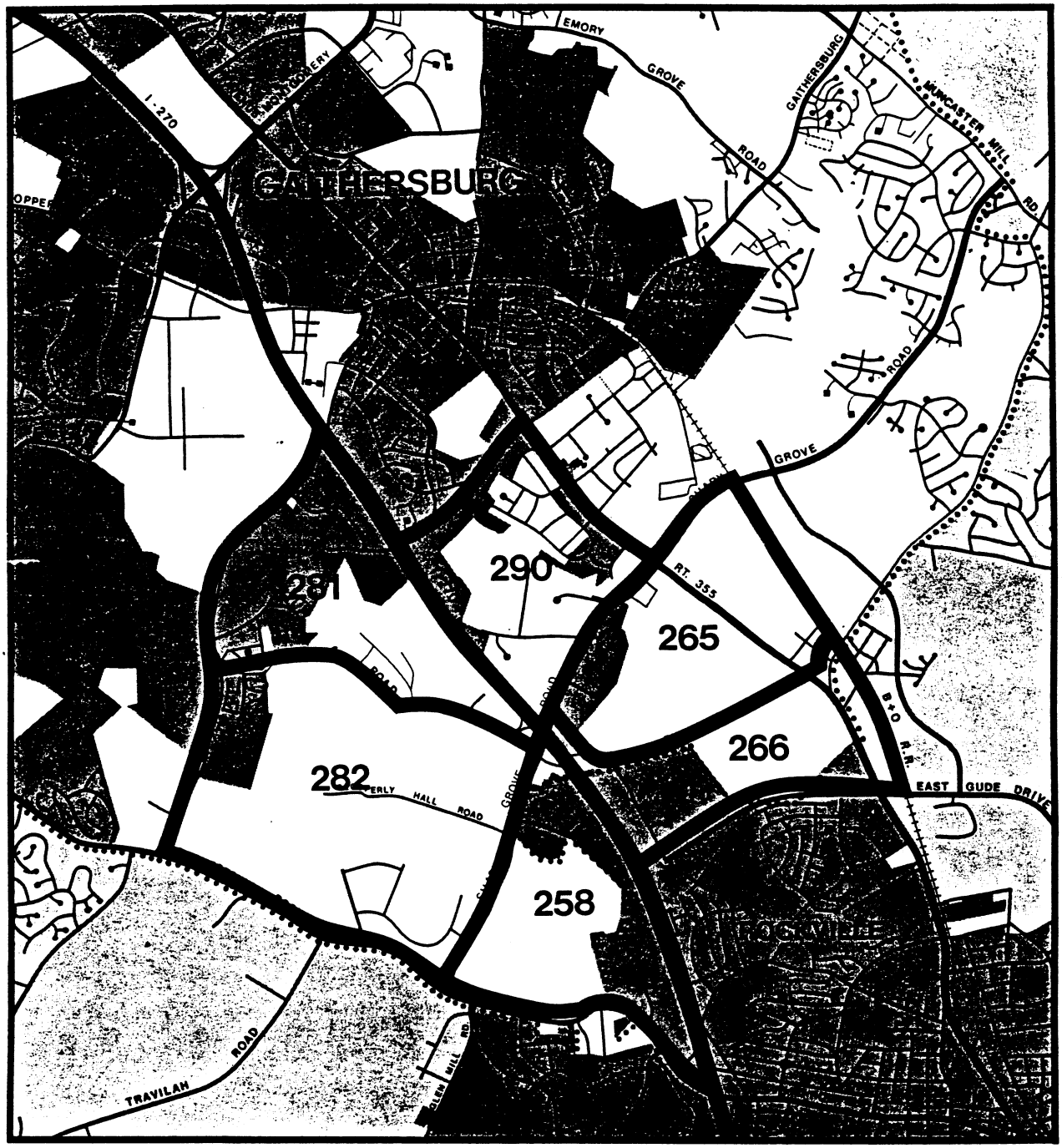
TABLE K

OFFICE EMPLOYMENT (1978-1988)
GAITHERSBURG MARKET AREA AND MONTGOMERY COUNTY

	Gaithersburg Market Area	Montgomery County	Market Area as Percent of County
1978 Non-goverment Employees	31,560	135,250	23.3%
1988 Non-government Employees	47,560	175,250	27.1%

Note: Reflects estimated growth of 4 million square feet in Gaithersburg Market Area and an average of 250 square feet per employee. Also assumes that 50 percent of total County employment consists of private office-type jobs.

Source: Ten Year Market Analysis (1978-1988): I-270 Market Area, M-NCPPC, November 1980.



SHADY GROVE ROAD AREA TRAFFIC ZONES

PLANNING AREA BOUNDARY

MUNICIPALITIES

GAITHERSBURG VICINITY MASTER PLAN — **Final Draft**

Montgomery County, Maryland

0 500 1000 METERS 2000

0 2000 FEET 4000 6000 8000

SEPTEMBER, 1983

TABLE L

GAITHERSBURG AREA AND COUNTY NON-RESIDENTIAL CONSTRUCTION
GROSS FLOOR AREA (SQUARE FEET)
January 1, 1979 through May 30, 1982

	1979		1980		1981		1982		Total	
	Gaithers-burg	% County	Gaithers-burg	% County	Gaithers-burg	% County	Gaithers-burg	% County	Gaithers-burg	% County
Office	111,668	14	134,361	8	837,489	28	311,950	40	1,395,468	23
Retail	175,253	46	114,548	21	34,340	9	112,628	58	436,769	29
Ind./Whse.	377,834	44	86,947	28	407,304	56	211,790	37	1,083,875	44
TOTAL	664,755	32	335,856	14	1,279,133	31	636,368	41	2,916,112	29

Source: U.S. Census and Research and Special Projects Division, Montgomery County Planning Board; 1985 and 1990 estimates are "high scenario" computations, based upon higher rates of population and housing gains.

TABLE M

GROSS FLOOR AREA NON-RESIDENTIAL CONSTRUCTION
MONTGOMERY COUNTY AND GAITHERSBURG AREA;
GAITHERSBURG SPACE AS A PERCENT OF COUNTY SPACE
1979 through May 30,1982

Year	Office Space		Retail		Industrial		Other	
	County	Gaithers-burg	County	Gaithers-burg	County	Gaithers-burg	County	Gaithers-burg
1979								
Square Feet	812,204	111,668	378,526	175,153	856,311	377,834	21,543	0
Percent		13.8		46.3		44.1		
1980								
Square Feet	1,598,158	134,361	554,174	114,548	315,574	86,947	89,350	59,452
Percent		8.4		20.7		27.6		66.5
1981								
Square Feet	2,965,365	837,489	379,961	34,340	722,431	407,304	0	0
Percent		28.3		9.0		56.4		
1-1-82 to 5-30-82								
Square Feet	781,699	311,950	195,304	112,628	575,125	211,790	0	0
Percent		39.9		57.7		36.8		

Source: Montgomery County Planning Board, Research and Special Projects Division, December 1982.

The abovementioned economic report examined the I-270 Corridor in terms of housing, retail, hotel, and employment markets. Table K shows that Gaithersburg Market Area employment was expected to grow from 31,560 in 1978 to 47,560 in 1988, an increase from 23.3 percent to 27.1 percent of the County's non-government office employment.

The Planning Board's public facility threshold analysis (1982 Comprehensive Planning Policies report) showed a Gaithersburg area transportation capacity starting in 1977 that would support 37,000 additional commercial, retail, and industrial jobs. By 1981, space for 9,200 of these potential jobs had already been provided, and there was capacity for 13,800 more, as reflected in approved sewer authorizations. Remaining potential sewer authorizations could provide space development to accommodate 14,000 additional jobs.

Between January 1979 and May 1982, 1.31 million square feet of industrial, 1.40 million feet of office, and 437,000 square feet of retail space were added to the Gaithersburg area's respective inventories. (See Tables L and M.) This translates into a potential average annual employment increase of 2,600 a year: 800 industrial space employees, 1,500 office workers, and some 300 retail jobs.

If all the above space were to be absorbed as produced, and that pace were to continue, it would take about 5.4 years to build out to the threshold-defined limit of growth, i.e., 14,000 additional jobs. Actually, it is expected that such absorption will take as much as eight to ten years. Office space development in 1981 and the first five months of 1982 proceeded at a pace six times greater than in the previous two years. Office space in the Gaithersburg area, as in all other parts of the metropolitan area, has been substantially overbuilt, clearly in excess of previously demonstrated absorption experience. Even with the expectation of a mid-1983 recession recovery start, it is likely that it will take a few years to adsorb the completed and on-line new office space construction.

Retail Market

Most recent retail space development in the Gaithersburg area has been dominated by the massive Lakeforest Mall regional shopping center, providing nearly 1.1 million square feet. There is general recognition that the size and diversity of Lakeforest Mall substantially over anticipated regional demands and capture rate capacities. The Planning Board's previous I-270 market study, at the time of Lakeforest Mall construction, predicted that it would take approximately ten years for this regional shopping center to attain its desired levels of shoppers and sales volume.

Shopping centers such as Lakeforest Mall are characterized by their provision of "shoppers goods," products that are bought infrequently, are more costly, and which are often selected on the basis of comparison shopping. In contrast to these goods are those provided by "convenience" retail outlets such as supermarkets, drug stores, dry cleaners, beauty parlors, and hardware stores. These goods and services are sought regularly, and customers tend to patronize such stores on the basis of such factors as accessibility and ease of parking. Such convenience outlets are typically found in neighborhood shopping centers in which supermarkets provide one of the principal anchors.

The foregoing differentiation is set forth to support the conclusion that the Gaithersburg area is currently oversupplied with shoppers goods outlets. Nevertheless, it can accommodate additional convenience retail outlets to support continuing residential

TABLE N

EXISTING RETAIL DEVELOPMENT (1978)
GAITHERSBURG MARKET AREA

Market Subareas	Square Feet	Estimated Employees
A	372,500	940
B	1,544,500	4,580
C	186,750	640
D	284,100	740
E	20,500	260
TOTAL	2,408,350	7,160

Source: Ten Year Market Analysis (1978-1988): I-270 Market Area, M-NCPPC, November 1980.

TABLE O

DEVELOPMENT POTENTIAL OF COMMERCIALLY ZONED
VACANT LAND (1978)
GAITHERSBURG MARKET AREA

Market Subareas	Acres	Square Feet	Employees
A	58.9	206,930	560
B	86.5	263,760	712
C	21.7	78,850	218
D	11.2	43,950	119
E	25.8	78,640	213
TOTAL	204.1	672,130	1,822

Source: Ten Year Market Analysis (1978-1988): I-270 Market Area, M-NCPPC, November 1980.

suburban growth of the area and provide an improved geographical balance of such convenience centers within the area.

Table N shows that in 1978, prior to the completion of Lakeforest Mall, the Gaithersburg area contained 2.4 million square feet of retail space, providing employment for an estimated 7,000 persons. Land zoned for retail development in 1978 provided a potential for an additional 670,000 square feet. (See Table O.) The combined 1978 inventory and the Lakeforest Mall development totaled approximately 3.5 million square feet, with an employment potential for some 10,000 persons.

On the basis of existing shopping space, and taking into account post-1978 and anticipated population and household increases in the Gaithersburg area, it is calculated that there is a need for an additional 152,500 square feet of retail space, exclusively of the convenience nature. This would represent approximately two full-size neighborhood shopping complexes, plus a moderate amount of free-standing, smaller stores. At the present time, two such convenience centers are in the planning and leasing stages, and both are located in the Goshen Road/Oden'hal area. Additional sites considered suitable for convenience shopping center development are located along Muddy Branch Road south of I-270, on Goshen Road near Snouffer School Road, and on East Diamond Avenue near MD 124.

In order to achieve a greater geographical balance of convenience shopping, this Plan recommends an additional site in the Airpark area for a full-size convenience shopping center to serve the Flower Hill Planned-Neighborhood. An additional center is also recommended in the Shady Grove West area to serve the residents and employees in the immediate area. Such modest overbuilding of convenience goods outlets is considered very temporary, within acceptable risk parameters, and is consistent with the rapid residential development of the area. These locations are shown on the recommended Land Use maps for the Study Areas.

Planning Implications

This section has described the Gaithersburg area's emergence and rapid growth as a major employment center. Continued employment and population growth in the area is consistent with its designation as a "corridor city," i.e., having sufficient total population and density to support corollary retail, services, and employment facilities.

It has been pointed out that the area's on-going and proposed growth will soon overtax its existing and programmed road capacity. The addition of I-370 capacity will extend the saturation threshold. Existing and prospective employers will increasingly seek assurance that their places of work and commerce will be accessible to employees, customers, and suppliers.

E. COMMUNITY FACILITIES

Schools

The Land Use Plan's recommendations concerning future school sites reflect the School Board's 15 Year Comprehensive Plan for Educational Facilities. Enrollment projections from that plan for the twelve elementary schools, three junior high schools, one special education and one high school located in the Planning Area are shown in Table P.

TABLE P

PUBLIC SCHOOLS SERVING GAITHERSBURG
CURRENT AND PROJECTED ENROLLMENT
(1982-1989)

School Name	Revised State-Rated Capacity	Grades Served	Actual Total Enrollment 9/82	Projected Total Enrollment 1983-84	1984-85	1986-87	1987-88	1988-89	
Brown Station	756[2]	K-6*	680	688	687	710	747	763	775
Diamond	789[1]/766[2]	K-6	626	606	590	591	620	641	656
Fields Road	543	HS-6**	377	400	428	483	518	555	582
Gaithersburg	760	K-6	586	601	658	740	850	959	1054
Mill Creek Towne	769	HS-5	597	592	602	598	615	621	626
Rosemont	389	HS-6	352	357	383	380	390	404	413
South Lake	550	K-6	491	501	511	520	535	557	563
Stedwick	670	K-6	608	584	580	581	557	561	561
Summit Hall	526	HS-6	371	342	318	313	319	339	353
Washington Grove	546	K-6	530	527	529	549	554	584	611
Watkins Mill	616[3]	HS-6	431	415	434	469	502	545	581
Whetstone	670[3]	K-6	567	554	552	579	584	601	602
Montgomery Village	1025/975[4]	7-9	893	838	728	615	595	575	575
Ridgeview	1180[4]	7-9	956	993	997	955	937	912	950
Gaithersburg	1245[3]/1195[4]	7-9	1098	1074	1000	925	880	860	895
Gaithersburg	1680[1]/1670[2]	10-12	1412	1321	1292	1282	1245	1147	1047
Longview Special Education	190		145						

1 Capacity of 1982-83.

2 One special education class added.

3 Relocatable classrooms.

4 No relocatable classrooms.

* K = Kindergarten. **HS = Head Start.

SOURCE: 15-Year Comprehensive Master Plan for Educational Facilities, Montgomery County Public Schools, January 1983.

Gaithersburg Library

The Gaithersburg Vicinity Planning Area is served by the Gaithersburg Library, largest of the County's four regional libraries (Wheaton, Rockville and Bethesda are the others). It is a new 30,000 square foot facility that provides service to up-County residents. Located at 18330 Montgomery Village Avenue, the building contains a general reading room with seating for 200 people, space for 150,000 books, a reference room, a children's room, an art collection room, two meeting rooms which can accommodate 40 and 150 people respectively, and a small conference room for groups up to 12. Other amenities include listening stations for phonograph records and tapes, rotating display cases, and a book return depository. Situated on a three-acre site, the building is designed to maintain maximum energy efficiency and to be easily accessible to handicapped individuals.

Current library policy is directed towards housing in-depth collections at the regional libraries, while stocking the local libraries with popular and best seller items, basic reference materials, consumer magazines, and information. Bethesda is the main library for business materials, Rockville is the municipal and state government reference branch, and Gaithersburg is the fine arts and performing arts branch.

Public Utilities

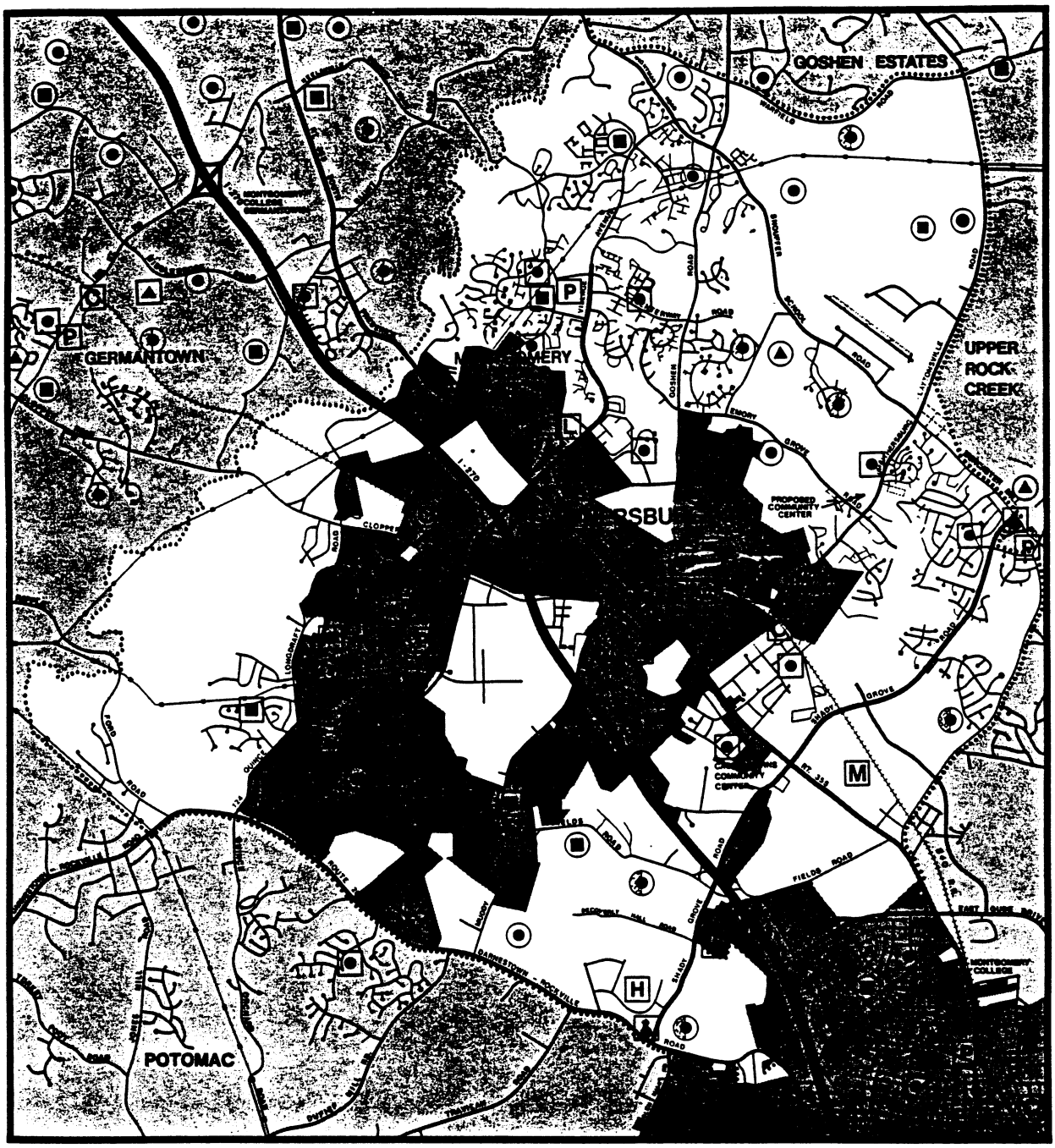
Community water and sewerage service is provided by the Washington Suburban Sanitary Commission (WSSC). The WSSC is a bi-county agency serving both Prince George's and Montgomery Counties. Most of the Gaithersburg area is currently served or programmed for service within the next two years. The Montgomery County Council establishes the sewer and water service priorities through the Comprehensive 10-Year Water Supply and Sewerage System Plan, reviewed twice yearly.

The Potomac Electric Power Company (PEPCO) provides electric power to the Gaithersburg area. The current policy is to put utilities underground as part of new construction, adding to the attractiveness of new communities.

Protective Services

The County and the city of Gaithersburg provide police protective services to the residents of the Planning Area under the terms of a 1978 Memorandum of Understanding between the police departments of the two jurisdictions. This agreement calls for the Montgomery County Police Department to provide police service within the city to the same extent as it does elsewhere in the County, and to assist the city by sharing data with them. The primary responsibility of the city police is to augment the County police, who provide the basic level of police protection service in the area.

Fire protection to the Planning Area is provided by Stations 8 and 28 of the County's Gaithersburg/Washington Grove Fire Department and Station 31 of the Rockville Fire Department.



COMMUNITY FACILITIES

..... PLANNING AREA BOUNDARY

MUNICIPALITIES

SCHOOLS	EXISTING	PROPOSED
SPECIAL SCHOOL	●	◉
ELEMENTARY	●	◉
PARK/SCHOOL	■	◉
JUNIOR HIGH	■	◉
SENIOR HIGH	▲	◉
COMMUTER RAIL STATION	C	Ⓒ

HOSPITAL	H
POLICE	★
FIRE STATION	🔥
POST OFFICE	P
LIBRARY	L
METRO STATION	M

GAITHERSBURG VICINITY MASTER PLAN

Montgomery County, Maryland

0 500 1000 METERS 2000 3000

0 2000 FEET 4000 6000 8000 10,000

Final Draft

SEPTEMBER, 1983

F. ENVIRONMENTAL CONCERNS

This chapter describes water-related concerns (erosion, flooding, stormwater management) in the Gaithersburg area and proposes general development guidelines to help protect water quality as development occurs.

Background data relating to noise and air quality is also presented.

LAND IMPACTS

Soils, Slope, Geology

The most severely limiting and sensitive soils in the Gaithersburg Vicinity are wet floodplain soils, highly erodible soils on steep slopes, and those soils found in association with the shallow, dense (ultramafic) bedrock conditions existing in isolated patches within the Planning Area. Floodplain soils occur along Great Seneca Creek and its tributaries. The Glenelg and Manor soils found on these steep slopes cut by streams are very susceptible to erosion which cause downslope or downstream sediment problems. The floodplain soils have obvious construction limitations because of wetness and the potential for flooding. These severely limited soils are shown on page 41.

In the Airpark Study Area, such soil conditions are found along the upper reaches of the Cabin Branch and Whetstone Run streams. However, these limitations are somewhat less severe in this area because it is less steep.

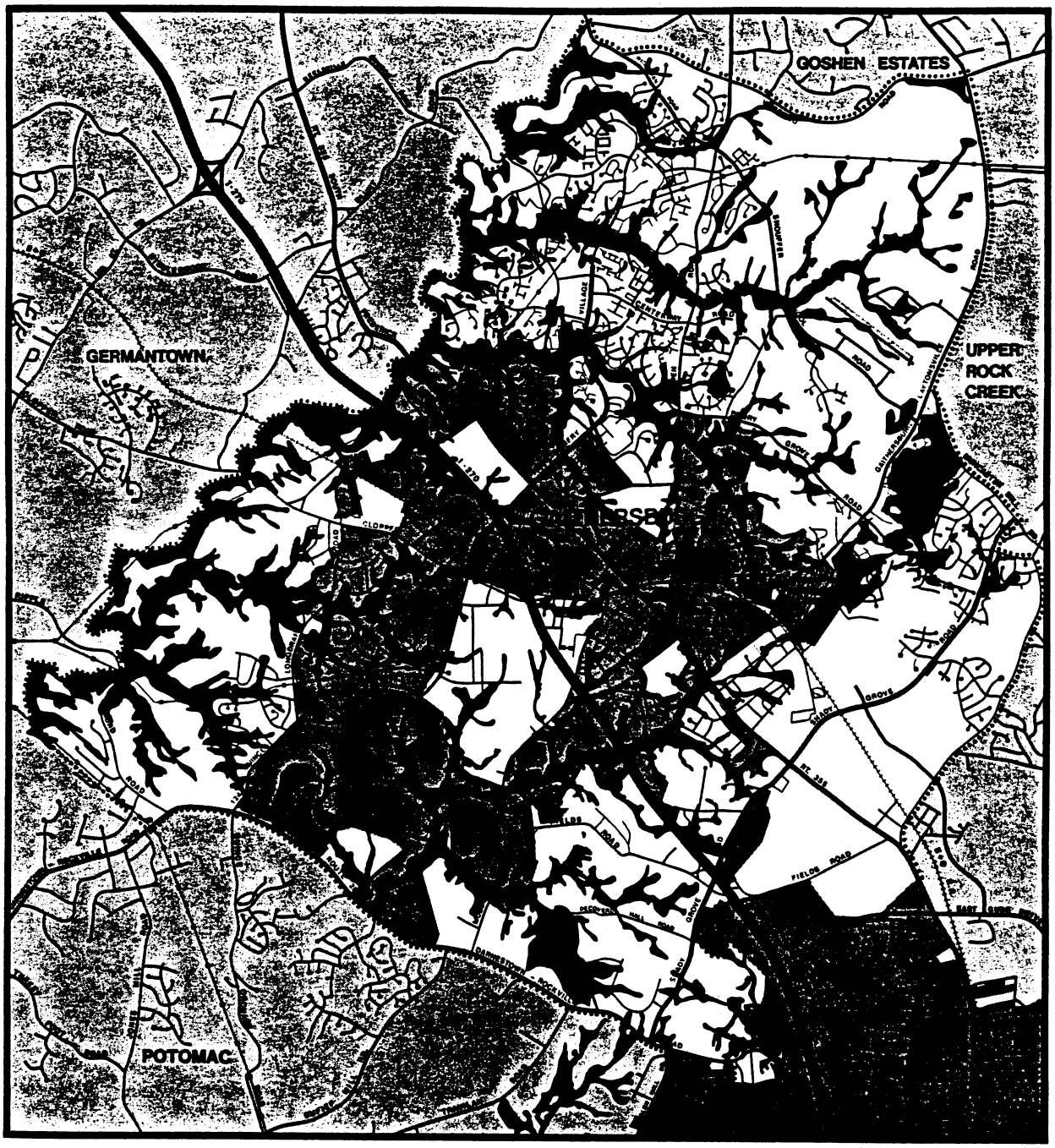
The Shady Grove West Study Area includes Muddy Branch and its tributaries, with areas in the eastern section draining to Watts Branch, and areas south of MD 28 draining to the upper reaches of Piney Branch, a sub-watershed of Watts Branch. These limited areas should be protected either through park acquisition or be reserved for open space in cluster-type development. North of MD 28, near the Shady Grove Life Sciences Center, the soils are underlain by ultramafic rock. Chrome and Conowingo silt loam soils are found in conjunction with this geologic feature. The Chrome soils are rocky and have shallow depth to bedrock, thus limiting construction of buildings with basements. In some instances, the soil is so severely eroded that bedrock is exposed. The Conowingo soils contain some clays which swell when wet and shrink as they dry, causing foundations and paved surfaces to crack, buckle, or warp. Site-specific soil and geologic testing can help determine specific construction requirements in these areas.

Floodplain, soils, and slope problems are particularly acute in the area near Smokey Glen Farm. Large areas along the tributaries of Great Seneca Creek are covered by floodplain (alluvial) soils. Manor soils are present along the steep banks. The extent of these soils leaves a reduced area of suitable soils along the ridge lines.

Water Quality

The Gaithersburg Vicinity Planning Area is located within portions of the Seneca Creek, Muddy Branch, Rock Creek, and Watts Branch basins. (See map on page 43.)

One of the best and simplest overall indicators of watershed stream quality is the total percentage of watershed imperviousness. Significantly higher-density/imperviousness results in higher quantities of stormwater runoff and often higher water pollution levels.



SEVERELY LIMITED SOILS

..... PLANNING AREA BOUNDARY

MUNICIPALITIES

SOILS HAVING SEVERE LIMITATIONS FOR HEAVY CONSTRUCTION AND/ OR RESIDENTIAL BUILDINGS WITH BASEMENTS

GAITHERSBURG VICINITY MASTER PLAN — Final Draft

Montgomery County, Maryland

SEPTEMBER, 1983

Water pollution can be categorized as either non-point source (pollution which emanates from a diffuse source or sources) or point source (pollution which emanates from a relatively concentrated source or sources). The only point sources in the area are the Seneca Waste Water Treatment Plant (with a 5.0 million gallon per day capacity, and an excellent effluent rating) and the Montgomery Village Sewage Treatment Plant, which is not in operation.

Stormwater runoff is the major source of non-point water pollution. The quality of stormwater runoff is related principally to the type of land over which the runoff flows. For water quality purposes, land uses can be characterized as either "urban/suburban" or "rural/agricultural."

In the "urban/suburban" areas, stormwater flows over sidewalks, streets, parking lots, and other highly impervious areas. Substances that are washed off include petroleum derivatives (gas, oil, grease), road salt, de-icers, litter, pet animal wastes, lawn and garden products, and disintegrated asphalt. In rural areas, stormwater flows over cultivated fields, feedlots, and pastureland and washes off pesticides, fertilizers, and livestock wastes.

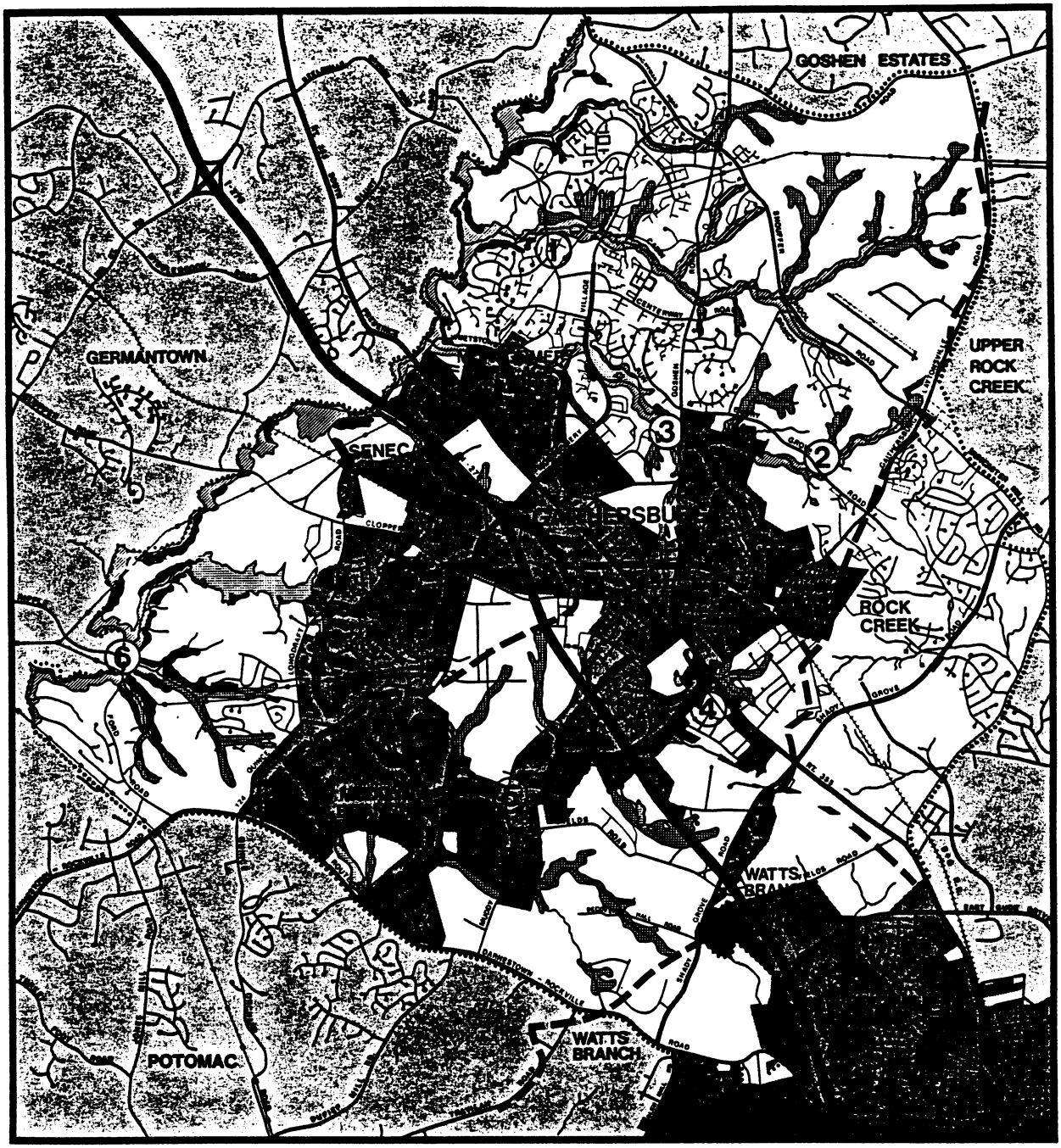
While the rate at which these substances wash off is much more rapid in urban/suburban areas, the overall effect from both types of land uses is essentially the same. Once carried into natural watercourses, all of these substances become in-stream pollutants. It is widely documented that they are responsible for the subsequent deterioration of water quality in terms of increased biochemical oxygen demand, excessive nutrient levels, active toxins, and potential carcinogens.

The Water Resources Administration of the State of Maryland's Department of Natural Resources has designated all of the streams in the Gaithersburg Vicinity as "Class I Waters," suitable for water contact recreation and aquatic life. These waters should be acceptable for activities in which the human body comes in direct contact with the surface water. They should also allow for the growth and propagation of fish, other aquatic life, and wildlife.

The Montgomery Department of Environmental Protection, County Water Quality Control Section has conducted a program of stream quality monitoring for streams within the major basins in the Gaithersburg Planning Area. Data on these streams from Water Quality of Streams in Montgomery County, Maryland, 1979 includes the following descriptive water quality ratings:

Basin	Stream	1978 - 1979 Water Quality Index 1978	1979
Great Seneca Creek	Cabin Banch	Permissible	Permissible
	Long Draught Branch	Good	Good
	Whetstone Branch	Good	Permissible
Muddy Branch		Good	Permissible

Class Types: excellent, good, permissible, poor or bad.



ENVIRONMENTAL CONSTRAINTS

- PLANNING AREA BOUNDARY
- MUNICIPALITIES
- FLOODPLAINS
- ALLUVIAL SOILS
- SLOPES OF 25% OR GREATER
- MAJOR RIDGE LINES
- EXISTING FLOODING PROBLEMS (see text for descriptions)

GAITHERSBURG VICINITY MASTER PLAN — Final Draft

Montgomery County, Maryland

SEPTEMBER, 1983

Upland and Stream Channel Erosion

Natural flooding and accelerated runoff from urbanizing areas are conditions that contribute to stream channel erosion. If stormwater runoff is left unmanaged, it may create problems stemming from accelerated erosion and sedimentation rates. There not only exists the potential loss of valuable topsoil, but many other adverse impacts also result from the transport and deposition of sediment in natural waterways. These include: accelerated erosion of streambanks, increased turbidity, increased treatment costs at water filtration facilities, and the blanketing of fish food supplies and nesting areas. Sedimentation also diminishes water storage capacity in reservoirs, creating the need for more frequent dredging at higher costs.

Stream channel erosion is a problem in the Great Seneca Creek, Long Draught Branch, and Whetstone Run sub-basins, and the Muddy Branch basin. New development in the upper watersheds of these streams may increase stream channel erosion. Recommendations contained in both the Functional Master Plan for the Seneca Creek and Muddy Branch Basins and Seneca Phase II Watershed Study regarding erosion should be incorporated into development proposals.

Flooding

Flooding is a threat to human life and property. Development of land will, if uncontrolled, increase the occurrence and intensity of flooding. As the percentage of impervious land increases (due to development of housing, highways, and shopping centers), on-site infiltration of stormwater decreases, resulting in higher volumes and higher peak runoff in stream channels over a relatively short period of time. In many cases, flooding is increased as the channel capacity is more frequently exceeded, creating in-stream erosion and greater flood damages. Present flooding problems in the Gaithersburg area are caused by existing development, as well as by constrictions at roads and bridges. Both the Functional Plan for the Seneca Creek and Muddy Branch Basins and Seneca Phase II Watershed Study list a number of recommendations which should be incorporated into all public or private development activities in the problem areas.

Flooding Problem Areas

The map on page 43 shows flooding problem areas identified in both studies. The following is a description of the nature of the problem at each identified location:

- On Cabin Branch, Watkins Mill Bridge is a low-level bridge that appears to be designed to permit periodic overtopping of the road by high stream flows. Its hydraulic capacity is limited and exhibits a 10 percent or greater chance of being flooded in any given year;

- On Whetstone Run, on the north side of Emory Grove Road, there is a residence located in the floodplain. The problem is made worse by a culvert for Emory Grove Road which has a limited hydraulic capacity where it crosses a tributary of Whetstone Run. This stream crossing exhibits a 10 percent or greater chance of being flooded in any given year;

- On Whetstone Run, west of Goshen Road, a horse barn is in the 100-year floodplain;

- On Muddy Branch, a single-family residence located on Rosemont Drive near MD 355 is very close to the floodplain;

- Muddy Branch Road, at the stream crossing, presents the most severe problem. It has an existing potential of being overtopped at a 3-year frequency and, under ultimate development, it could be expected to flood yearly. The proposed reconstruction of Muddy Branch Road will eliminate this problem; and

- On the Great Seneca Creek, the bridge at Riffle Ford Road is subject to flooding at a 15-year frequency for existing development. For ultimate development, the frequency is once in 10 years.

Watershed Development Guidelines

Site-specific analysis of each property is beyond the scope of this Plan. However, the following general recommendations should be used as a guide to such analysis before development plans are formulated and submitted for development review.

The following recommendations are applicable to all types and scales of development that may occur in the area:

- Encourage clustering of development to optimize location and efficiency of stormwater and land management measures;

- Avoid development on steep slopes (above 25 percent), severely erodible soils, poorly-drained soils, floodplains, groundwater recharge areas, or other environmentally sensitive locations;

- Retain natural vegetation with emphasis on the preservation of mature wooded areas. Vegetation should be retained as an undisturbed natural buffer strip along all streams;

- Preserve environmentally-sensitive areas such as wetlands, steep slopes, or those with poor soils;

- Prohibit development in the ultimate 100-year floodplain;

- Utilize the floodplain buffer required by the subdivision regulations and building code to help protect natural waterways from potential degradation as development proceeds. This buffer should be expanded on a case-by-case basis where necessary to accomplish the intent of the requirements;

- Avoid unnecessary (and potentially massive) upland erosion by phasing land clearing and grading with the actual start of construction. Natural vegetation should be retained to the extent possible to protect against erosion and to trap sediment generated on site. Spoil piles should be covered or other protection provided, such as straw bales, to reduce sediment transport;

- Carefully evaluate, and avoid where possible, the conversion of any stream or spring into a piped storm sewer system;

- Avoid the installation of any in-stream structures which will prevent or inhibit the natural movement of aquatic life;

- Divert stormwater flows from areas vulnerable to erosion through the use of diversion techniques such as interceptor berms or diversion dikes;

- Employ techniques to reduce the velocity of water at all locations where stormwater is concentrated, such as the outfalls of stormwater detention ponds, to reduce upland and channel erosion; and

- Wherever feasible, employ drainage systems such as grass-lined or stone-filled ditches and swales instead of concrete pipes or channels.

The following recommendations are designed to reduce the negative impacts on natural drainage systems that may be associated with large scale, medium to high density development:

- Reduce stormwater runoff volumes and velocities by incorporating drainage systems into large impervious expanses. These systems might include "dutch drains" (gravel-filled ditches with an optional pipe in the base, used as dividing strips between parking lots or as a drain for small parking lots or driveways), drainage swales, or grass-lined or stone-filled ditches;

- Install litter trips in and along drainage ditches, culverts, roadways, and parking lots to reduce biochemical oxygen demand loading of waterways;

- Consider, in areas with large areas of impervious (i.e., impenetrable) surface, such as shopping centers, providing runoff storage above that normally required by Montgomery County Soil Conservation District;

- Utilize oil and grease controls in large parking lots to reduce the washing of oil and grease into ground water or streams;

- Require stormwater management techniques, structural and non-structural, to control the quality and quantity of runoff from new development;

- Cluster proposed development to protect natural waterways and accommodate the siting of sediment basins and stormwater management facilities; and

- Provide adequate maintenance of stormwater catchment basins and drainage pipes.

NOISE CONCERNS

The Roadway Noise Map in the Land Use Plan text provides a general indication of area of maximum possible roadway noise impacts, based on traffic conditions with ultimate development as recommended in this Plan. These contours do not take into

TABLE Q

PROJECTED NOISE CONTOURS FOR SELECTED ROADWAYS,
ULTIMATE CONDITIONS

Road Name	Route No.	Range of Distances (feet) From Road Centerline to 60 dBA, Contour Line*
Darnestown - Rockville Road	MD 28	305 - 560
Midcounty Highway	MD 115	109 - 576
Eisenhower Highway	I-270	1385 - 2143
Emory Grove Road	-	42 - 95
Fields Road, southwest of I-270	-	217 - 398
Frederick Road	MD 355	258 - 533
Gaithersburg Bypass	-	236 - 383
Gaithersburg-Laytonsville Road	MD 124	83 - 408
Great Seneca Highway	-	398 - 910
Gude Drive	-	373 - 651
Key West Avenue	-	275 - 406
Longdraft Road	-	131 - 235
Metro Access Highway/ Intercounty Connector	I-370	460 - 1298
Montgomery Village Avenue	-	187 - 524
Muddy Branch Road	-	171 - 347
Muncaster Mill Road	MD 115	308 - 325
Quince Orchard Road	-	190 - 275
Research Boulevard	-	198 - 208
Shady Grove Road	-	260 - 825
Snouffer School Road	-	175 - 400
Warfield Road	-	48 - 81

* The location of a noise contour may change along the length of a road due to variation in projected traffic volume, traffic speed, and/or truck mixes in different segments of the road.

This analysis assumes each road and adjacent areas is level, and traffic is free flowing. Noise attenuation due to berms/barriers, topographic changes or road cuts, shielding by buildings, etc. is not taken into account.

Source: Montgomery County Planning Board, Environmental Planning Division, 1983.

account potential attenuation through natural or man-made features. Table Q illustrates the projected noise contours at ultimate development for selected roadways.

AIR QUALITY

Air quality problems in the Washington metropolitan area result primarily from vehicular exhaust, particularly from automobiles. The State Implementation Plan (SIP) has been adopted to control pollution emissions. Ozone, which reaches the highest levels in the summer, is a regional pollutant, identified in the most current SIP as the most pervasive air pollution problem in the Washington metropolitan area.

Localized air quality problems occur on or near high volume, congested roadways and intersections where high levels of carbon monoxide (CO) are produced. Some indications of high CO levels are available. There are several ways to minimize CO problems. Sensitive residential areas should be set back from congested areas to allow for natural dispersion of CO. At high density, congested locations, ventilation systems should be designed to avoid drawing high CO levels into structures.

G. MONTGOMERY COUNTY AIRPARK

The presence of the Montgomery County Airpark has strongly influenced land use recommendations for surrounding properties. This section includes a brief history of the Airpark, describes business use at the Airpark and summarizes existing County policies regarding Airpark expansion. Studies regarding safety and noise are also highlighted.

	No. of Runways	Length of Runways	Width of Runways	Instrument Landing System	Other Comments
Montgomery County Airpark	1	4200'	75'	no	-
Frederick Municipal	3	4000'	100'	yes	-
Carroll County (Westminster)	1	3230'	60'	no	no easements on surrounding property
Manassas Municipal	2	3700'/5700'	100'	yes	easements bought fee simple
Davis Airpark (Montgomery County)	1	2200'	30'	no	limited hangar space
Leesburg Godfrey Field	1	3500'	75'	no	no easements, no land use conflicts

- Development Background

Recognizing an imminent void in service to the aviation community in the late 1950's when Congressional Airport on Rockville Pike was committed to shopping center development, the County Council approved a proposal from a private developer to build the Montgomery County Airpark. The 122-acre general aviation facility, built entirely at the developer's expense as part of an industrial park, was deeded to the Montgomery County Revenue Authority in 1958. The developer retained a 99-year lease for operation. Its amenities include a 4,200-foot paved runway, paved taxiways, a terminal building, hangars, paved and grass tie-down areas, parking areas, runway lighting, radio and visual landing aids, and fuel service.

Other general aviation airports in the Washington region compare to the Montgomery County Airpark is as follows:

- Economic Overview

The airport developer pays the Revenue Authority an annual rent equal to the tax that would be paid on the improvements if the facility were privately owned. The July 1, 1982, rent billing was $14,569.80, one-half of which must be escrowed for airport improvements. According to the Revenue Authority, land purchase, engineering, and lighting improvement expenditures have exceeded the escrow account.

Original development and subsequent improvement costs are nearly amortized. The airport developer leases the facility to an operator who pays a monthly rental.

- Financial Assessment - Condemnation Costs

One consideration in regard to reducing the noise and safety impacts of the Airpark on the surrounding existing and proposed development is to relocate the facility. In addition to finding an acceptable alternate location there would be significant problems associated with terminating operations at the current location.

Seventy-seven years remain on the lease. Approximately $18½ million would be attributable to lease value alone. Improvements and derivative business income (fuel sales, repair service, aircraft sales, flight training, and charter service) indicate a condemnation cost of $30-$50 million. The lease provides for reversion of the land to the developer, should the facility cease to function as an airport. Additionally, termination of operations would require reimbursement of development funds to the Federal Aviation Administration.

It does not, therefore, appear reasonable to relocate the facility or to terminate its operation. What needs to be done is identify compatible land uses for the surrounding area and take reasonable measures to mitigate the impacts of the operation of the Airpark. Issues of noise and safety are discussed below as is the proposal for a noise abatement program and the establishment of a noise zone.

- Business Use of the Airpark

A survey of business use of the Airpark, conducted by the Gaithersburg Chamber of Commerce in November 1981, produced ambiguous findings. This survey resulted in 72

successful interviews out of 282 firms contacted. Six of these firms reported that they do use the Airpark for business purposes, but that they use it "infrequently," and feel that major regional airports are suitable alternatives. However, these firms expect to make greater use of the Airpark in the future.

Sixty-six responding firms do not use the Airpark and feel strongly that the major regional airports are suitable alternatives. But this latter group also indicated that they view the Airpark as essential to area business and feel strongly that the Airpark will be of long term benefit. Neither group of respondents (users and non-users) view the nearby Frederick Municipal Airport as a viable long-term alternative.

Although there is no strong evidence that the Airpark is presently a major element in the County's economic development, it may be in the future. The convenience of its present location and the difficulty in finding another suitable airport location enhance its value to the business community and the County. Therefore, in spite of the lack of evidence of strong direct support for the Airpark by the local business community, this Plan seeks to maintain the integrity of the Montgomery County Airpark as a factor in the economic investment climate of the I-270 area.

- Safety

Montgomery County Airpark operates without a control tower to guide landing airplanes. Aircraft landings are governed by the pilot's visual perception of the airport runway, his radio communications with airport personnel on the ground, and observation of federal aviation laws.

Residents living near the Airpark are concerned about the potential for accidents in the area. Three events in 1982-1983 brought attention to this situation: a near miss of a home by a plane taking off from the Airpark, an unscheduled landing in a field where homes will be built in the future, and a fatal crash off the end of the runway. Nonetheless, the State Aviation Administration (SAA) does not feel that safety is a critical problem because the airport has a good long-term safety record and because it operates according to accepted rules and regulations.

A report prepared in August 1981 for Kettler Brothers, entitled, Analysis of Safety and Noise Factors for the Montgomery County Airpark, by Howard Needles Tammen & Bergendoff, presents the following conclusion concerning safety:

> "In summary, statistics on a national basis indicate that with the present number of aircraft operations, the Airpark can expect some form of aircraft accident in the airport traffic pattern or within a mile of the airport (but off the airport) once in each 1 or 2 years." (p. 6)

The location of these accidents, should they occur, has been statistically evaluated by the National Transportation Safety Board. Based on 1978 nationwide data, 45 percent of all general aviation accidents occur on the runway or on airport property. It should be noted that the area of high accident potential off the airport generally corresponds to the area of high noise impact.

Although the airport is designed to assure safety and its regulations are directed towards reducing the possibility of accidents, they cannot be entirely prevented. Therefore, developments occurring within the airport's normal flight pattern should take the existence of those patterns into account. While the likelihood of planes crashing into homes is extremely remote, these developments should, if possible, provide contiguous open space for possible emergency landings.

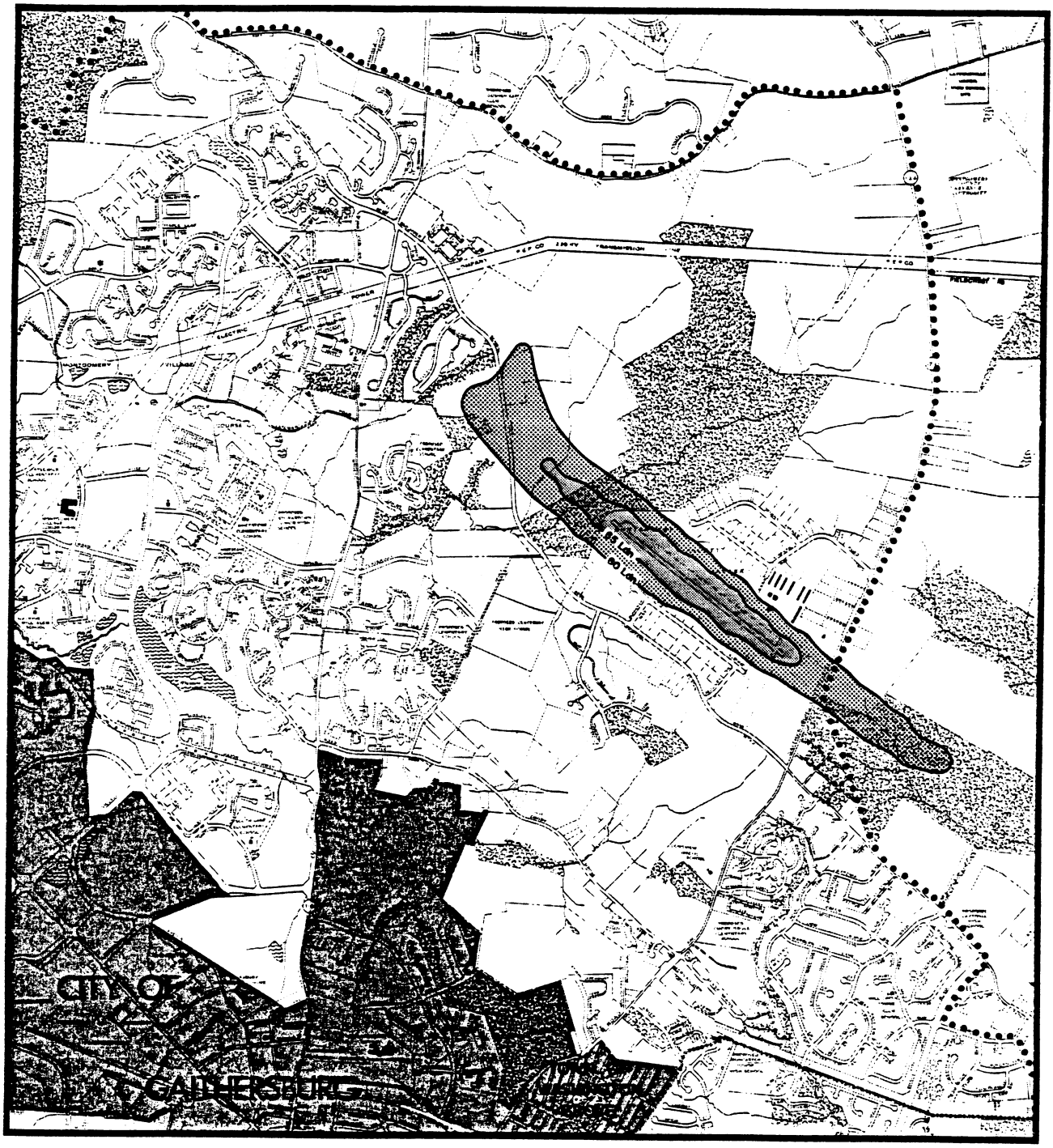
Noise

The degree of noise tolerance is a largely subjective issue that reflects individual and community values. While the likelihood is that most noise complaints would originate from residential areas where the highest noise levels occur, complaints can and do occur beyond the usual standards for noise impact (the Ldn 60 day-night average sound level contour) and in other areas far removed from the Airpark. It is reasonable to expect, therefore, that some people living in the remote environs of the Airpark will feel affected, even though their homes are located well outside the projected noise contours.

The day-night average sound level (Ldn) is a measure of the average noise environment at a prescribed location, over a 24-hour period, with a 10 dBA penalty for noise occurring in the nighttime hours (10 P.M. - 7 A.M.). For calculating Ldn values resulting from aircraft operations, the following factors are considered: the number of landings and takeoffs by different aircraft types, the noise characteristics of each of these aircraft types, the way in which each aircraft is flown, the track that it follows, the runway it uses, and the time of day the flight occurs.

Land use compatibility criteria provide a basis for determining the extent of existing land use conflicts with aircraft noise and the suitability of land for various types of uses in the vicinity of the Airpark. The U.S. Department of Housing and Urban Development classifies the area between the Ldn 55 and 65 contours as "normally acceptable" for residential construction. The SAA has adopted noise standards to assess the compatibility of various land use types in the vicinity of airports. The SAA standard for residential uses is also Ldn 65 dBA, but the SAA has recommended a more stringent criteria of Ldn 60 dBA for general aviation airports such as the Montgomery County Airpark. This Land Use Plan has recommended compatible land uses (non-residential) in areas with aviation noise greater than Ldn 60 dBA. Further discussion of the SAA's involvement in airpark/land use compatibility issues follows later in this chapter, in the discussion on the proposed Airpark Noise Zone, and in the Implementation Chapter.

It should be noted that a cumulative noise descriptor, such as Ldn, is not the only indicator of an individual's potential for disturbance by aircraft noise. The day/night average does not address the issue of the "single event noise," the noise likely to occur each time an aircraft flies past a certain point. The number of these single event noises during any one day will be equal to the number of aircraft operations on that day; the loudness and duration of the noise will be determined by the type of aircraft and its flight altitude. For example, aircraft landing at the Airpark follow a standard glide slope of three degrees. This means that an airplane will be descending approximately 350 feet per mile on its approach. If it is coming straight in, it will be flying at roughly 350 feet above ground level at a distance of one mile from the end of the runway, and 175 feet at one-half mile. As can be seen on page 52, there is a large area that is potentially subject to a relatively high noise level due to the proximity of aircraft on arrival and departure from the airfield.



NOISE CONTOURS - YEAR 2000

- ••••• PLANNING AREA BOUNDARY
- MUNICIPALITIES
- EQUAL TO OR GREATER THAN 65dBA Ldn
- 60-64 Ldn
- BELOW 60 Ldn

SOURCE: PRELIMINARY DATA BY STATE AVIATION ADMINISTRATION

GAITHERSBURG VICINITY MASTER PLAN —
Montgomery County, Maryland

0 250 500 METERS 1000 1500
0 1000 FEET 2000 3000 4000 5000

Final Draft
SEPTEMBER, 1983

Existing Public Policy

After three years of study to determine the aviation needs of the County and the role that the Airpark should play, the Ralph M. Parsons Company completed their report for the Revenue Authority in 1969. In 1970, based on this report, the County Council found that an expanded airpark facility at its current location would not appear to be essential to the continued economic growth of the County, and that environmental pollution could be severe should the Airpark be enlarged at its present location. Based on these findings, the County Council adopted Resolution 6-2796 on April 7, 1970, which provided that:

1. The existing Montgomery County Airpark should not be expanded either by lengthening the existing runway or by constructing an additional runway, and

2. The Revenue Authority and County officials should continue to study the feasibility and availability of alternative locations for an airpark facility so that, should the need exist, a new facility might be programmed for a less congested, more remote area of the County.

Accordingly, this policy was incorporated into the 1971 Master Plan for the Gaithersburg Vicinity:

> "A recent study, sponsored by the Montgomery County Council, concluded that there is a demonstrated need for longer runways to accommodate different types of aircraft. The County Council, however, has determined that the increased activity and the noise of the larger planes and jets would be detrimental to the residential communities which have been established within the area influenced by the Airpark. Therefore, the established public policy is to improve the safety and convenience of the present Airpark, but no expansion of the Airpark facilities is authorized." (p. 21)

Since that time, the County's land use decisions and developments in the Airpark Study Area have been predicated on this policy. In May of 1971, however, the Airpark's operator made an unauthorized extension of the runway, which brought the runway from 3,150 feet to its present length of 4,200 feet. This extension has encouraged a limited but increasing number of operations by small jets, in contradiction to established public policy. It should be pointed out that noise contours projected to the year 2000, shown on page 52, assume that this policy will continue.

Some aviation interests feel that the current public policy regarding the expansion of the Airpark should be re-examined. In 1982, the Airpark operator proposed to extend the runway by 800 feet and install an instrument landing system (ILS). This suggestion has significant implications for the Land Use Plan, the most important of which is to change the flight path from the circular pattern to a straight line glide and takeoff path which extends over a much larger area, much of which is already residentially developed. Whether such a change in the facility constitutes a safety improvement cannot be simply stated. The need for an expanded facility must also be questioned in view of the

relatively close proximity to the Frederick Airport which has a similar 4000-foot runway length and an operational ILS.

The Davis Airpark is a small general aviation airpark in the Goshen Woodfield area. The specific use of the Montgomery County Airpark, relative to Davis, is under review by various government agencies at this time.

APPENDIX 3

DEFINITIONS

Adequate Public Facilities Ordinance (APF): A provision in the subdivision regulations which requires that existing and programmed public facilities be sufficient to accommodate proposed private development. The APF is administered by the Montgomery County Planning Board.

Advanced Wastewater Treatment (AWT): A sewage treatment method or process beyond normal (secondary) sewage treatment to increase the removal of pollutants, to remove potentially harmful substances, and/or to produce high quality effluent suitable for reuse or discharge. Sludge is a major by-product of the advanced wastewater treatment process.

Agricultural Reserve: Primary agricultural areas of Montgomery County which include the majority of the county's remaining working farms, and certain other non-farm land uses.

Alluvial Soils: Soils made up of sand, silt and other lossely consolidated sediments deposited on land by streams.

Aquifer: A water-bearing layer of permeable rock, sand, or gravel.

Areas of Critical State Concern: Areas in the State of Maryland which have such unusual or significant importance that future use is of concern to the state. Legislation enacted in 1974 requires counties, municipalities, and the City of Baltimore to recommend areas within their jurisdiction for consideration by the Department of State Planning for designation as Areas of Critical State Concern. Major examples in Montgomery and Prince George's Counties include significant sand and gravel deposits, land along the Potomac River, and natural trout waters such as Paint Branch.

Assisted Housing: Housing which is built and/or operated with government financial assistance, including subsidies, low interest loans, or mortgage guarantees. There are two types of assisted housing: moderate-income housing, for which the eligibility standard for residents is an income less than 80 percent of the metropolitan area median income; and low-income housing, for which the eligibility standard is less than 50 percent of the metropolitan area median income.

Base Density: The maximum number of dwelling units or square footage of nonresidential space per unit of land that can be built in an area in the absence of bonuses which accrue from the application of transferable development rights (TDR's), floating zones, planned development zones, or public amenities and benefits recommended in a master plan; that density which is reasonable and acceptable from a planning perspective without consideration of such bonuses.

Base Zone: A euclidean zone recommended in a master plan to achieve the base density.

Best Management Practices (BMP): A practice, or combination of practices, that is the most effective and practical means of preventing or reducing flooding, erosion, and pollution generated by stormwater runoff.

Biochemical Oxygen Demand (BOD): A measure of the demand on a water body's dissolved oxygen supply generated over a period of time by the biological decomposition of organic matter in the water.

Biota: The flora and fauna of a region or area.

Buffering: Isolation or separation of different land uses by a third land use, by open space, or by a physical separator such as a wall. Low density offices and townhouses are frequently used to separate commercial and detached residential areas.

Building Elevation: A vertical view of one side of a structure, usually the front or side facing a street.

Capital Improvements Program (CIP): A County government six-year program prepared by the County Executive and adopted by the County Council which identifies the County's construction program and funding requirements for public facilities. It is subject to annual review and revision.

Carrying Capacity: (1) The capacity of public roads to carry traffic at a reasonable level without congestion. (2) The capacity of the water and sewerage system to supply water and carry off liquid waste generated by development.

Chemical Oxygen Demand (COD): A measure of the amount of a water body's dissolved oxygen supply that would be used in completely oxidizing added chemical compounds.

Cluster Development: An option in the subdivision regulations which permits lots of varying shapes and sizes, some smaller than the minimum otherwise permitted in a conventional subdivision, and some with different types of dwelling units, in return for improved design and provision of common open space. The average density achieved in cluster subdivisions is often slightly higher than in conventional subdivisions.

Comprehensive Planning Policies (CPP): An amendment to the County General Plan which establishes development thresholds for all parts of the County based on the carrying capacity of existing and programmed public facilities. The most important of these facilities are roads, sewerage systems and water lines. As new facilities are programmed in the CIP, the thresholds are revised. The objective of the CPP is to stage growth so that growth is in balance with the facilities needed to serve it.

Concept Plan: A generalized idea or set of ideas that forms the basis for a master plan.

Day/Night Noise Levels (L_{dn}): An average sound pressure level, reflecting the variations in noise over time, including a weighting for nighttime (10 p.m. - 7 a.m.) levels to account for the greater degree of distraction experienced at night while trying to sleep. This descriptor is currently being used by the U.S. Environmental Protection Agency and the State of Maryland for their noise standards.

Decibel (dBA): The standard expression for units of sound, with a weighting to account for the sensitivity of the human ear.

Development Right: One dwelling unit of transferable density in the transferable development rights program. Also see Transfer of Development Rights.

Dissolved Oxygen (DO): The concentration of oxygen dissolved in water, usually expressed in milligrams per liter.

Drainage Area: The area of a drainage basin or watershed. Also called catchment area, watershed, and river basin.

Easement: A contractual agreement to gain temporary or permanent use of and/or access through a property.

Effluent: Liquid outflow from a wastewater treatment process, such as primary, secondary, or advanced wastewater treatment.

Equivalent Noise Level (L_{eq}): Steady sound pressure level which, for a given period of time, contains the same sound energy as the actual time varying sound during the same time period.

Euclidean Zone: A zone in which certain uses are permitted, as a matter of right, but they are subject to rigid requirements such as lot size; front, side and rear setbacks; and height limits. A euclidean zone may be applied for either by the property owner or by the government, and thus may be applied by sectional map amendment. Maryland law states that a local map amendment rezoning to a euclidean zone is permissible only if there has been a change in the character of the neighborhood or a mistake in the original zoning. error). Also see Sectional Map Amendment and Local Map Amendment.

Floating Zone: A zone which is in the nature of a special exception. Normally a floating zone is applied by local map amendment on application of the property owner or other person having a proprietary interest. Before a floating zone can be granted, it must meet specific tests stated in its "purpose clause" and must be found to be compatible with surrounding land uses.

Flood Frequency: The frequency with which a flood may be expected to occur at a site in any average interval of years. For example, frequency analysis defines the "100 Year Flood" as being the flood that will, over a hundred years, be equaled or exceeded on the average only once or, statistically, has only a one percent chance of occurring in any year.

Floodplain: That area of land adjoining a stream which is inundated temporarily by water whenever the stream overflows its banks. The ultimate 100-year floodplain represents the area which would be inundated by flooding due to a 100-year frequency storm after the ultimate planned development occurs.

Floor Area Ratio (FAR): The ratio of the gross floor area of a building to the area of the lot on which it is located. Parking and unoccupiable space in the building are generally excluded from the computation. For example, a building with gross floor area of one acre on a two acre lot would have a Floor Area Ratio of 0.5.

General Plan: The county-wide comprehensive plan entitled On Wedges and Corridors, adopted in 1964 and updated in 1969. It provides the overall framework for the county's future. Each master plan adopted since 1969 amends the General Plan.

Groundwater: Subsurface water from which wells and springs are fed and which provides the base flow of streams.

Headwater: (1) The source of a stream. (2) The water upstream from a structure or point on a stream.

Hydraulic Capacity: The volume of flow which can effectively be handled by man-made structures or natural streams.

Impervious Surface: That portion of the land surface through which water cannot penetrate.

Impoundment: A pond, lake, basin, or other space, either natural or man-made, used for the storage, regulation, and control of water.

Infrastructure: The built facilities such as streets, bridges, schools, water and sewer lines, other utilities, parks, etc., that service a community's developmental and operational needs.

Interceptor Berm: A temporary ridge of compacted soil constructed across disturbed areas to shorten the length of exposed slope, thereby reducing the potential for erosion by intercepting storm runoff and diverting it to a stabilized outlet or sediment trap.

Level of Service (LOS): A traffic engineering term which describes conditions on a segment of roadway. There are six levels, ranging from free flowing conditions (level of service "A") to very heavy traffic, extremely unstable flows, and long delays (level of service "F").

Local Map Amendment: A change of zoning, normally sought by the owner or other person having a proprietary interest. Applications for local map amendments may be filed only during the months of February, May, August, or November, and are considered according to procedures specified in the zoning ordinance. A local map amendment can include more than one tract of land. Land can be combined for purpose of rezoning. Approval of a local map amendment normally requires the affirmative vote of a majority (four members) of the County Council. If the proposed rezoning is contrary to the zone recommended in a master plan, however, approval requires affirmative vote of five Council members, unless the Planning Board has recommended in favor of that approval, in which case, a four-vote majority of the Council is sufficient for approval.

Master Plan: A document which guides the government and private individuals in the way an area should be developed. In Montgomery County, master plans amend and/or detail, for portions of the county, the recommendations of the County's General Plan.

Mixed-Use Development: The integration of different, usually compatible or mutually supportive land uses on a site or into a single building or complex.

Moderately Priced Dwelling Unit (MPDU): A dwelling unit which meets price levels specified under Chapter 25A of the Montgomery County Code. The levels are adjusted annually by the County Executive. Developments of 50 or more units must include at least 12.5 percent which are MPDU's.

Noise Abatement Plan: A detailed program of changes in airport operations which has as its goal the reduction or elimination of impacted land use areas.

Nonpoint Source Pollution: Pollution that enters a water body from diffuse origins in the watershed and does not result from discernible, confined, or discrete sources.

Non-Structural Controls: Measures designed to mitigate negative watershed impacts associated with storm flows, usually accomplished through site design, the application of conservation practices such as density control, or buffering.

On-Site Stormwater Management: Stormwater management techniques applied within a given site boundary, usually near the source of stormwater runoff.

One-Hundred Year Ultimate Floodplain: The floodplain that would result from a 100-year frequency flood, calculated on total development in a watershed.

Operational Controls: Methods for improving traffic flow that do not involve major physical change to a roadway. Examples include progressive signal timing, reversible lanes, left or right turn lanes, carpool and bus lanes, or turn restrictions at intersections.

Optional Density: Density in dwelling units, or square footage of nonresidential space per unit of land, that would be compatible with surrounding land uses (existing and proposed) and would be within the carrying capacity of the public facilities. Optional density can be achieved through the use of various bonuses, including transferred development rights (TDR's) or planned development (PD). Also see Planned Development Zoning and Transfer of Development Rights.

Park Take-Lines (also called park acquisition lines): Proposed boundaries for park acquisition and inclusion in the county park system. Areas considered for stream valley parks generally include floodplains, steep slopes, and sites of environmental sensitivity.

Planned Development Zoning (PD): A group of "floating" zones which allow a broad range of housing types, flexibility of design, a mix of land uses and which encourage better land planning with greater efficiency, convenience, and more amenities than conventional, or euclidean, zoning categories. A development plan must be approved at the time of zoning.

Planning: The orderly, reasoned process of evaluating the existing and future needs of an area and its residents, and the preparation of alternatives and recommendations to meet those needs.

Point Source Pollution: Pollutants emanating from specific and identifiable sources and discharged to specific locations. These pollutants are often liquids discharged from a pipe.

Preferential Runway System: A diversion of traffic away from noise-sensitive areas by use of a preferred runway which is directed toward less populated areas. For a one runway system, this may also refer to a preferred direction of landing or takeoff under neutral wind conditions.

Progressive Signal System: A series of traffic lights, timed to permit groups of vehicles to pass through several successive intersections without stopping.

Receiving Area: An area designated on a master plan to receive transferred development rights. The addition of development rights permits a higher density of development than that permitted by the base density, but the density may not exceed that recommended in the master plan. The base density may be increased by one dwelling unit for each development right received. Development rights are transferred by easement and the transfer is recorded in the county land records. Also see Base Density and Transfer of Development Rights.

Retention Pond: A natural or artificial impoundment that maintains a permanent water supply.

Ride-On: Local, county-operated minibus system.

Runoff: That portion of precipitation in a drainage area that is discharged from the area in to streams. Runoff can pick up pollutants from the air or the land and carry them into the stream.

Schematic Development Plan: A development plan for Planning Board review and County Council approval submitted as part of an application for the rezoning of land into floating zones at the option of the applicant. Such schematic development plans limit development to that specified in the application.

Sectional Map Amendment: A comprehensive rezoning, initiated by the Planning Board or County Council, covering a section of the County, and usually including several tracts of land. It normally follows a master plan study. It may propose various zones to be applied to various individual tracts. The County Council must hold a public hearing on a proposed sectional map amendment. Since enactment of a sectional map amendment is considered a legislative action of the government, and is intended as a comprehensive implementation of public policy, it does not require a finding of a change in the character of the neighborhood or a mistake in the original zoning. Approval is by majority vote of the council.

Sending Areas: Areas located within the Agricultural Reserve , which have a basic right of development under the rural density transfer zone of one unit per 25 acres, but which are assigned transferable development rights at one unit per five acres.

Setback: The required distance that a proposed structure or parking area must be located from the property lines or from other buildings. Setbacks are specified in each zone.

Severely Limited Soils: Soils which have properties so unfavorable and difficult to correct or overcome as to require major soil reclamation and special construction measures.

Site Plan: A detailed plan, required in certain zones, that usually shows proposed development on a site in relation to immediately adjacent areas. It indicates roads, walks, parking areas, buildings, landscaping, open space, recreation facilities, lighting, etc. The Planning Board must approve the site plan before building permits can be issued.

Special Exception (Use): Uses not permitted by right in a zone but which may be permitted subject to a specific request for permission and a grant of approval by the Montgomery County Board of Appeals.

Staging: An element of a master plan and the county's growth management system which coordinates the schedule of public facility construction with the pace of private development.

Stormwater Management: The application of various techniques for mitigating the adverse effects of stormwater runoff.

Subdivision: (1) The division of a lot, tract, or parcel of land into two or more lots, plots, sites, tracts, parcels or other divisions for the purpose, whether immediate or future, of sale or building development. (2) The recombination of lots previously created into a new configuration.

Ten Year Comprehensive Water Supply and Sewerage System Plan: The program of the Washington Suburban Sanitary Commission, subject to approval by the County Council, for the provision of water and sewerage service in Montgomery County.

Transfer of Development Rights (TDR): The conveyance of development rights, as authorized by local law, to another parcel of land and the recordation of that conveyance among the land records of Montgomery County. Also see Receiving Area and Sending Area.

Transit Serviceable: Locations of sufficient population, employment, and/or commercial density to enable them to be served efficiently by public transit.

Turbidity: A measure of light penetration into a water body, and therefore the depth to which green plants will grow.

Two Year Storm: A storm with a 50 percent statistical probability of being equalled or exceeded in a given year.

Ultimate Land Use: Future land use as prescribed by the most recent master plan assuming total implementation of that plan. In actual practice, development densities rarely exceeds 80 percent of ultimate land use.

Unique Vegetation: Individual plant species or vegetative communities which are highly uncommon within a given area.

Vehicular Capacity: A measure of the maximum number of vehicles that can pass through a given road segment, or intersection, during a given time period. Capacity is measured for each level of service (LOS). Also see Level of Service.

Vesting: Rights which accrue to a land owner during the development process as various approvals are obtained.

Watershed: The area contained within a topographic divide above a specified point on a stream; the area which drains into that stream.

Wildlife Habitat: An area which supplies the factors (i.e., food, cover, water, etc.) necessary for the existence and propagation of wildlife.

Zoning: The division of a municipality or county into districts for the purpose of regulating the use of private land. These zones are shown on an official atlas which is part of the zoning ordinance. Within each of these districts the text of the zoning ordinance specifies the permitted uses, the bulk of buildings, the required yards, the necessary off-street parking, and other prerequisites to obtaining permission to develop.

Zoning Map Amendment: A change to the zone on a given parcel or group of parcels, as shown on the zoning atlas. Also see Local Map Amendment and Sectional Map Amendment.

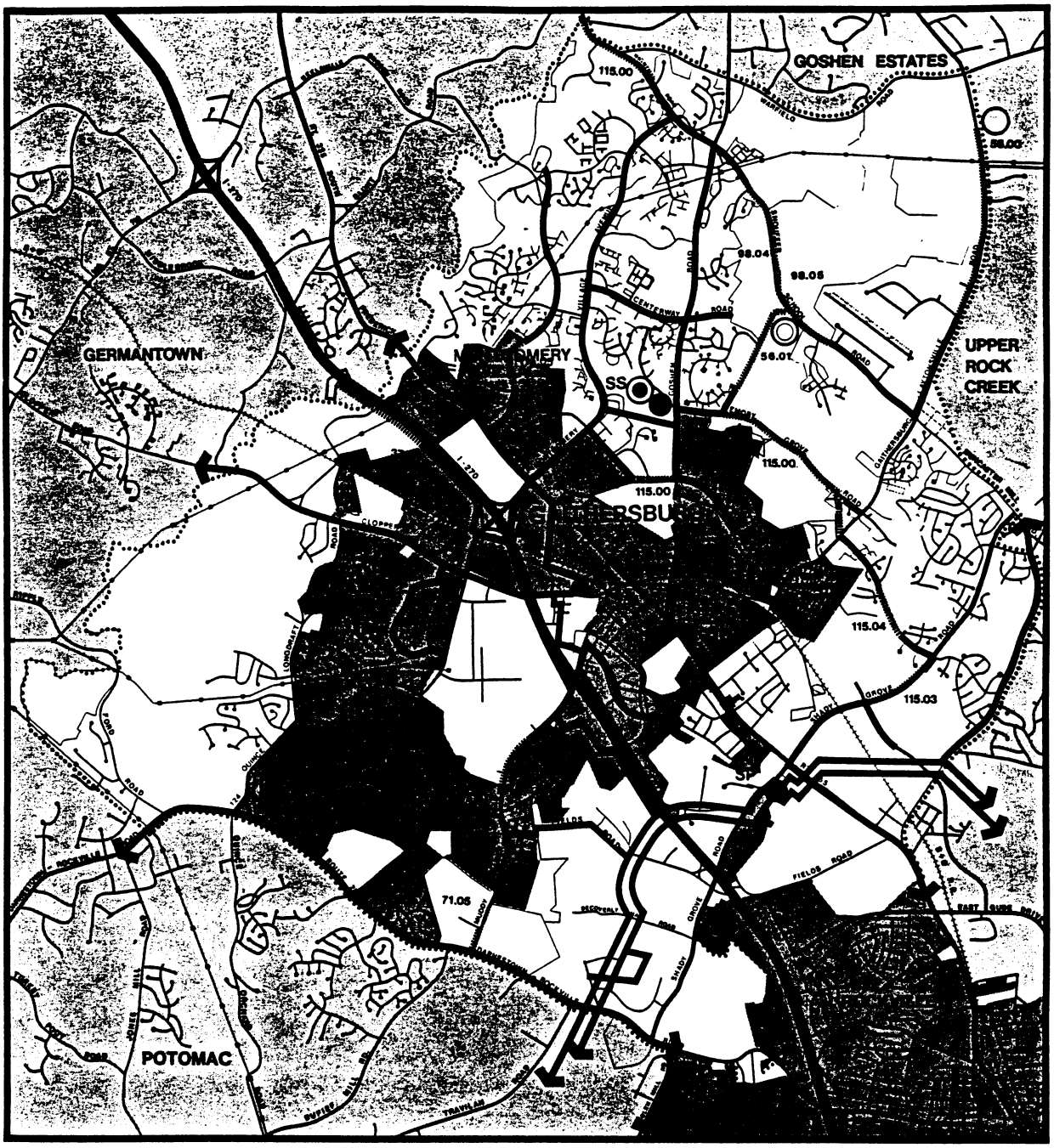
Zoning Text Amendment: A change to the regulations of a given zone or zones, as stated in the text of the zoning ordinance.

APPENDIX 4

PROPOSED WATER PROJECTS

Storage and transmission line projects proposed for the study area are listed below. In addition to the active CIP projects, Project W-115.00 is included in the CIP as a dependent project, meaning that it will be built in the future when the need develops.

Project Number	Project Name	Estimated Cost ($000)	Project Description
W37.04	270 Water Line	4,303	13,985 feet of 48 inch water main along 270 from Montgomery Village Avenue to Middlebrook Road.
W-56.02	Snouffer School Road	248	3,320 feet of 16 and 24 inch water main along Strawberry Knoll and Snouffer School Roads.
W-56.03	Strawberry Knoll Road Water Line	102	1,150 feet of 24 inch water main along Strawberry Knoll Road south of W-56.02.
W-71.05	Muddy Branch Road Water Line	445	4,290 feet of 24 inch water line along Muddy Branch Road between MD 28 and Fields Road.
W-98.03	Hunters Woods	75	1,410 feet of 16 inch water line along Snouffer School Road north of W-98.04.
W-98.04	Fulks Property	213	3,400 feet of 16 inch water line along Snouffer School Road north of W-56.02.
W-115.03	Shady Grove Road	520	3,300 feet of 30 inch water line along Shady Grove Road west of Briardale Road.
W-115.04	Amity Drive Water Line	176	1,705 feet of 24 inch water line from intersection of Amity Drive and Taunton Drive to Briardale Road.
W-115.05	Watkins Mill Road Water Line	180	2,600 feet of 16 inch water line along Watkins Mill Road from Travis Avenue to Watkins Mill Drive.



PLANNED WATER FACILITIES

····· PLANNING AREA BOUNDARY

MUNICIPALITIES

	EXISTING	PLANNED
WATER STORAGE TANKS	●	○
ES Elevated Storage		
SP Stand Pipe		
SS Surface Storage		
WATER PUMPING STATIONS	◉	◎
TREATED WATER TRANSMISSION	—	—

SOURCE: MONTGOMERY COUNTY 1984-89 CAPITAL IMPROVEMENTS PROGRAM

GAITHERSBURG VICINITY MASTER PLAN

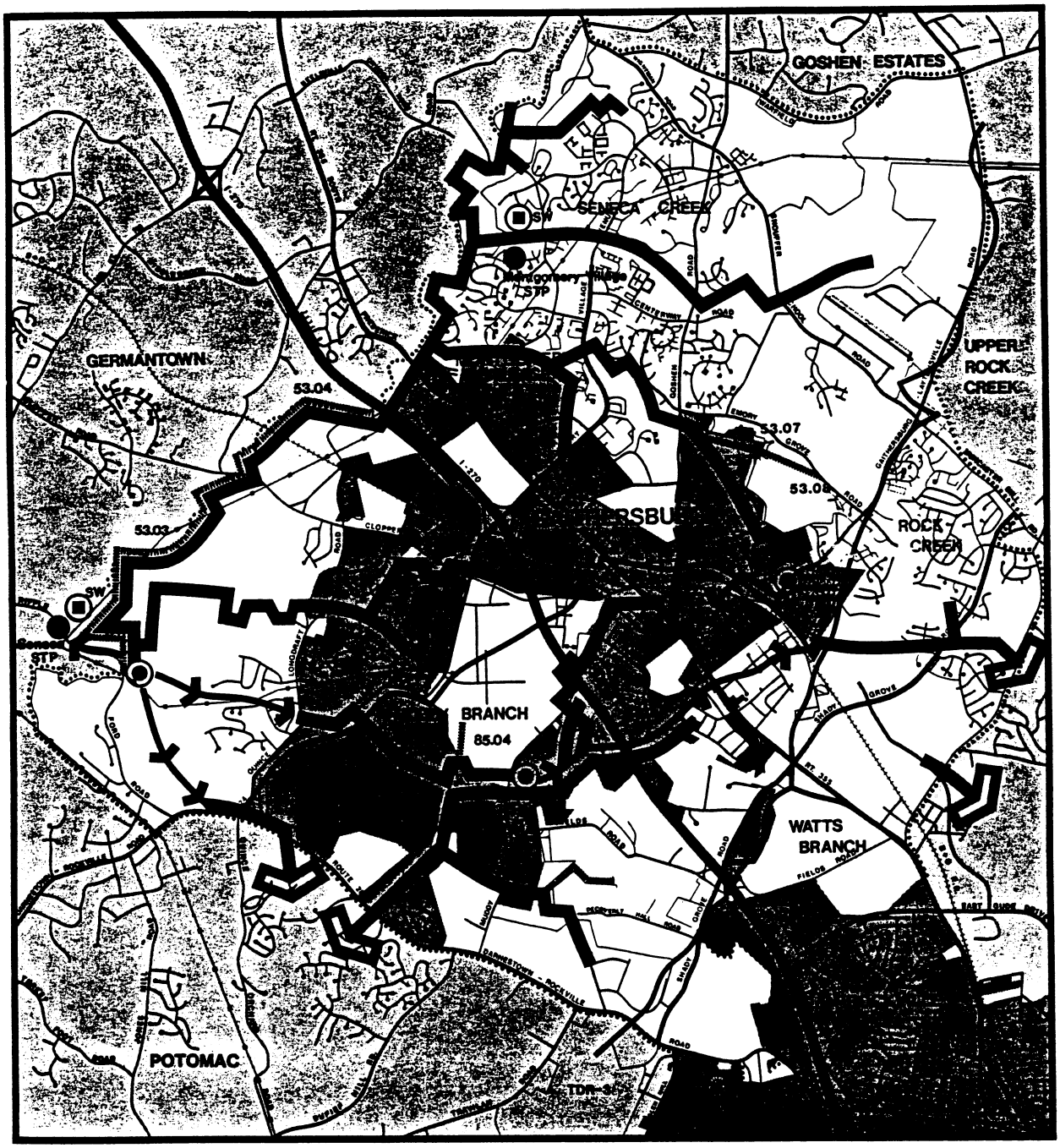
Montgomery County, Maryland

0 2000 FEET 4000 6000 8000 10,000

0 500 1000 METERS 2000 3000

Final Draft

SEPTEMBER, 1983



PLANNED SEWER FACILITIES

- PLANNING AREA BOUNDARY
- MUNICIPALITIES
- FORCE MAINS
- BASIN LINES

	EXISTING	PLANNED
SEWAGE PUMPING STATIONS	◉	◎
DISCHARGE POINTS	▣	▢
SW Surface Water		
SEWAGE TREATMENT PLANTS (STP)	●	○
INTERCEPTORS, OUTFALLS	▬	▭

SOURCE: MONTGOMERY COUNTY 1984-89 CAPITAL IMPROVEMENTS PROGRAM

GAITHERSBURG VICINITY MASTER PLAN

Montgomery County, Maryland

Final Draft
SEPTEMBER, 1983

Project Number	Project Name	Estimated Cost ($000)	Project Description
W-56.00	Airpark Pressure Zone Storage	3,994	2 mg elevated storage facility and 8,000 feet of 16 inch water line along MD 124 from Airpark Road to site.
W-56.01	Airpark Pressure Zone Pumping Station	859	5.5 mgd pumping station south of Strawberry Knoll Road at intersection with Snouffer School Road.

Source: Adopted Fiscal Years 1983-1988, CIP.

PROPOSED SEWERAGE PROJECTS

The proposed 1984-89 Capital Improvements Program (CIP) include Project S-49.09, the Rock Creek Facility Plan, which will examine measures to increase the capacity of the Rock Creek interceptor. Projects S-53.03 and S-53-04, the Great Seneca Relief Sewers, are included in the CIP as dependent projects, meaning that they will be constructed when needed. Other active CIP projects in the study area are listed in the following table.

Project Number	Project Name	Estimated Cost ($000)	Project Description
S-85.07	Muddy Branch, Branch C	412	1,630 feet of 15 inch sewer along Branch C of Muddy Branch.
S-53.01	Seneca Whetstone Run Branch J	504	4,550 feet of 15 inch sewer along Branch J of Whetstone Run.

Source: Adopted Fiscal Years 1983-1988, CIP.

APPENDIX 5

COST FOR PROJECTS RECOMMENDED IN THE GAITHERSBURG VICINITY MASTER PLAN
ROADS

Facility Type, Name and Location	Project Description	CIP Status[1]	Estimated Project Cost (1984 Dollars)
FREEWAYS			
F-1 I-270 - Washington National Pike	From Great Seneca Creek to Planning Area Boundary; Paving Width 8 lanes divided, 4.3 miles; R/W 250'	--	$ 24,668,000
I-370 Metro Access Highway	From I-270 to Plan Boundary (Redland Road); Paving Width 6 lanes divided	FY 88-90	10,254,000
F-9 I-370 Connector	From I-270 to Great Seneca Highway, Paving Width 6 lanes divided; R/W 120'	FY 88-90	9,725,000
Intercounty Connector	From I-370 to Redland Road, Paving Width 6 lanes divided, R/W 300'	--	18,264,000
Controlled Major Highways			
M-83 MD 115 Midcounty Highway	Montgomery Village Avenue to Shady Grove Road; R/W 120' to 150', Paving Width 4 lanes divided, 3 miles	FY 84-88	8,843,000
M-90 Great Seneca Highway Phases II & III	From Great Seneca Creek to MD 28 at West Ritchie Parkway; Paving Width 6 lanes divided, R/W 150';	FY 86 and Beyond 6-Year Program	33,197,000
Major Highways			
M-15 Muddy Branch Road	From MD 28 to MD 117; Paving Width 4 lanes divided; R/W 120';	FY 86-90	11,091,000
M-22 MD 28 Darnestown-Rockville Road/Key West Avenue	From Riffleford Road to Muddy Branch Road; Paving Width 4 lanes divided	--	3,655,000
M-2 Shady Grove Road Extension-Muncaster Road	From Muncaster Mill Road to Olney-Laytonsville Road, R/W 120', Paving Width 4 lanes divided	--	5,542,000
M-23 Gude Drive Extension (I-270 Bridge)	From MD 355 to Research Boulevard; Paving Width 4 lanes divided; R/W 120'	FY 84-85	4,565,000

COST FOR PROJECTS RECOMMENDED IN THE GAITHERSBURG VICINITY MASTER PLAN
ROADS (Cont'd.)

Facility Type, Name and Location	Project Description	CIP Status[1]	Estimated Project Cost (1984 Dollars)
Major Highways (Cont'd.)			
M-24 MD 124 (Part) Quince Orchard Road	From Clopper Road to the GEISCO site and from GEICSO site to MD 28; R/W 120'; Paving Width 4 lanes divided	FY 84-85	3,699,000
M-21 MD 124 Relocated (Part) Oden'hal Avenue/ Gaithersburg/Laytonsville Road	From Snouffer School Road to Goshen Road, Paving Width 4 lanes divided	--	4,593,000
M-22 MD 28 Key West Avenue	From Shady Grove Road to Gude Drive Extended, R/W 120'; Paving Width 4 lanes divided	FY 87-88	3,434,000
M-22 MD 28 Key West Avenue	From MD 28 to Shady Grove Road, Paving Width 4 lanes divided, R/W 120'	FY 85-90	4,553,000
M-22 MD 28 Key West Avenue Extension	From Gude Drive to MD 28, Paving Width 4 lanes divided R/W 120'	--	1,752,000
M-26 MD 117-124 Clopper Road/ West Diamond Avenue	From Great Seneca Creek to Muddy Branch Road, Paving Width 4 lanes divided, R/W 120'	--	3,178,000
M-25 Goshen Road	From Emory Grove Road to Snouffer School Road; Paving Width 4 lanes divided, R/W 120'	--	3,504,000
Arterial Highways/Business District Streets			
A-16 Snouffer School Road	From Goshen to MD 124, Paving Width 4 lanes divided, R/W 80'	--	3,240,000
A-36 Shady Grove Road Bridge/ Interchange	Design and construction of new ramps from Shady Grove Road to I-270 (northbound and eastbound) and second bridge over I-270	FY 86	8,180,000
Shady Grove Widening East	From MD 28 to Briandale Road, Paving Width 6 lanes divided	FY 84	2,068,000
Shady Grove Widening West	From Corporate Boulevard to MD 28, Paving Width 6 lanes divided, 1.2 miles	FY 85-87	1,580,000

COST FOR PROJECTS RECOMMENDED IN THE GAITHERSBURG VICINITY MASTER PLAN
ROADS (Cont'd.)

Facility Type, Name and Location	Project Description	CIP Status[1]	Estimated Project Cost (1984 Dollars)
Arterial Highways/Business District Streets (Cont'd.)			
A-17 Watkins Mill Road Bridge	From Watkins Mill Elementary School to Travis Road, Paving Width 4 lanes divided	FY 86-87	1,032,000
A-261 Fields Road	From Muddy Branch Road to Omega Drive, R/W 80'; Paving Width 50 feet	FY 88-90	4,717,000
	From Piccard Drive to MD 355, R/W 80'; Paving Width 4 lanes divided	FY 85-86	3,865,000
	From Muddy Branch to I-370 Extended, Paving Width 4 lanes	--	6,903,000
A-261a Omega Drive	From intersection of Fields Road and I-270 ramp to Key West Avenue, R/W 80'; Paving Width 50 feet	FY 85-86	1,886,000
A-268 Airpark Road Extended	From MD 124 to Shady Grove Road, R/W 80'; Paving Width 50 feet, 1.8 miles	Pre Study FY 85	4,448,000
A-95 Fieldcrest Road Extended	From MD 124 to East Montgomery Village Avenue, R/W 80', Paving Width 4 lanes divided	--	2,386,000
A-275 Centerway Road Extension	From Snouffers School Road to Centerway Road, Paving Width 4 lanes, R/W 80'	FY 84	621,000
A-280 Existing MD 28	From Key West Avenue to Great Seneca Highway and from Glen Mill Road to Research Boulevard; Paving Width 4 lanes divided	--	3,558,000
A-284 Diamond Back Drive	From Muddy Branch Road to Fields Road; Paving Width 4 lanes divided	--	3,935,000
A-17 Longdraft Road	From Quince Orchard to Clopper Road, R/W 80'; Paving Width 4 lanes divided	FY 86-87	2,524,000

COST FOR PROJECTS RECOMMENDED IN THE GAITHERSBURG VICINITY MASTER PLAN
ROADS (Cont'd.)

Facility Type, Name and Location	Project Description	CIP Status[1]	Estimated Project Cost (1984 Dollars)
Industrial Roads			
I-7 - Gaither Road	From Shady Grove Road to Fields Road, R/W 80'; Paving Width 50 feet	FY 85-86	2,368,000
I-9 Fields Road/Redland Road	From B&O Railroad to proposed Crabbs Branch Way; R/W 80';	FY 85	3,274,000
I-6 Crabbs Branch Way	From existing end of paving on Crabbs Branch Way to south of Redland-Fields Road, R/W 80', Paving Width 4 lanes	FY 84	1,813,000
Other Transportation Projects			
Gaithersburg Commuter Rail Station	Improvement of the rail passenger station at Gaithersburg	FY 85-87	330,000
MD 115/MD 124 intersection	Improvement of the MD 115/MD 124 Snouffer School Road intersection	FY 85	460,000
TOTAL			$213,705,000

NOTE: 1. Projected construction schedule from the Adopted FY 85-90 Capital Improvements Program.

COST FOR PROJECTS RECOMMENDED IN THE GAITHERSBURG VICINITY MASTER PLAN
SCHOOLS

Facility Type, Name and Location	Project Description	CIP Status	Estimated Project Cost (1984 Dollars)
SCHOOLS			
Flower Hill Elementary School	A new 700 student elementary school built on the Flower Hill site.	Scheduled to open in September 1985	$ 4,892,000
Washington Grove Elementary School	Modernization	FY 85	2,006,000
Elementary School-Fields Road area	Construct new 700 student park school on site at Fields Road between Muddy Branch and Shady Grove Road.[1]	None: site to be acquired and facility to be constructed when needed	4,500,000[2]
Elementary School-Thomas Farm area	Construct new 700 student park school on site at Shady Grove Road and MD 28 east of Life Sciences Center.[1]	None: site to be acquired and facility to be constructed when needed	4,500,000[2]
Elementary School-Warther Tract area	Construct new 700 student school on site on Muddy Branch Road north of Great Seneca Highway.	None: site to be acquired and facility to be constructed when needed	4,500,000[2]
Elementary School-Quince Orchard Road area	Construct new 700 student school on site at Quince Orchard Road near National Geographic Society.[1]	None: site to be acquired and facility to be constructed when needed	4,500,000[2]
Elementary School-Woodward Road area	Construct new 700 student school on site south of Emory Grove Road near Flower Hill Planned Neighborhood.	None: facility to be constructed when needed	4,500,000[2]
Elementary School-Strawberry Knoll Road area	Construct new 700 student park school (Strawberry Knoll or Independence) on site on Strawberry Knoll Road.	None: facility to be constructed when needed	4,500,000[2]
Elementary School-Warfield Road area	Construct new 700 student park school on site at Warfield Road in Montgomery Village East Development.[1]	None: site to be acquired and facility to be constructed when needed	4,500,000[2]
Blueberry Hill Elementary School-Redland Road area	Construct new park school on site west of Redland Road and east of Shady Grove Road Extended adjacent to Blueberry Hill Local Park.	None: facility to be constructed when needed	4,500,500[2]
High School-Quince Orchard Road	Construct new 1600 student school on site near MD 28 and Quince Orchard Road in the vicinity of National Geographic Society.[1]	None: site to be acquired and facility to be constructed when needed	20,000,000[2]
High School-Strawberry Knoll Road Area	Construct new 1500 student school on site on Strawberry Knoll Road near Centerway Road.	None: facility to be constructed when needed	20,000,000[2]
Gaithersburg High School	A 16 classroom addition and improvements to core facilities.	FY 85-86	3,912,200
High School-Watkins Mill (formerly called Seneca High)	Construct new 1600 school on site at the western edge of Montgomery Village, adjoining Seneca Creek.	None: facility to be constructed when needed	20,000,000[2]
TOTAL			$106,810,000

NOTE: 1. The exact location has not yet been determined.
2. Acquisition and equipment costs not included.

COST FOR PROJECTS RECOMMENDED IN THE GAITHERSBURG VICINITY MASTER PLAN
WATER AND SEWER DISTRIBUTION SYSTEM

Facility Type, Name and Location	Project Description	CIP Status	Estimated Project Cost (1984 Dollars)
WSSC SEWERAGE PROJECT			
Gudelsky Tract Station	A temporary package pumping station	FY 86	$ 563,000
Muddy Branch Basin (Shady Grove West Area)	Possible major relief sewers in the Muddy Branch Basin and new service (estimated at $5 million) to the Gudelsky/Percon Tract	--	10,000,000[1,3]
Cabin Branch and Whetstone Run Basin (Airpark Area)	Possible major relief sewers in Cabin branch and Whetstone Run	--	2,000,000[2,3]
WSSC Water Project			
Airpark Pressure Zone Storage	A 2 mgd elevated storage facility to be designed in an desirable manner	FY 85	4,804,000
Airpark Pumping Station	A 5.0 mgd water pumping station (ultimate capacity 5.5 mgd)	FY 85	1,123,000
Muddy Branch Road Main, Part 3	2,000 feet of 24 inch diameter water main	FY 86	212,000
Muddy Branch Road Main	4,290 feet of 24 inch diameter water main	FY 88	474,000
"Fulks Property" Parts IV and V	1,000 feet of 16 inch diameter water main	FY 85	69,000
Muddy Branch Road Water Main, Part 2	1,735 feet of 24 inch diameter water main	FY 86	185,000
WSSC Dependent Water Project[4]			
Warfield Road and MD 124	7,100 feet of 16 inch diameter		
Goshen Road and Warfield Road Water Main	4,500 feet of 16 inch diameter, 3,000 feet of 24 inch diameter		
Muddy Branch Road Water Line	4,530 feet of 24 feet diameter		
Emory Grove Road Water Line	5,630 feet of 24 feet diameter, 1,500 feet of 20 feet diameter		
Stormwater Management Project			
Crabbs Branch Subwatershed SWM RC	Two-phrase stormwater management system for Crabbs Branch	FY 85	3,020,000
Shady Branch Site 5 SWM MB	Design and installation of a stormwater detention structure	FY 86	545,000
TOTAL			$22,995,000

COST FOR PROJECTS RECOMMENDED IN THE GAITHERSBURG VICINITY MASTER PLAN
WATER AND SEWER DISTRIBUTION SYSTEM (Cont'd.)

NOTES:

1. The cost does not take into consideration the cost of likely improvements to the Muddy Branch SPS or the possibility of future storage facilities that might be necessary to attenuate peak flow rates entering the Dulles Interceptor.

2. The cost does not take into consideration of the costs for possible improvements to the Seneca Creek trunkline system, the Seneca SPS and Seneca Treatment Plant.

3. In general, these are planning level costs derived by approximating the sizes and lengths of necessary sewer facilities needed to augment the existing sewer facilities. However, the actual sizes and lengths of these facilities could change after more detailed flow/capacity and economic analyses. In addition, possible expansion to existing pumping stations and the Seneca Treatment Plant, the likely rerouting of flows between Seneca, Muddy Branch and Rock Creek, and the possible additions of in-basin storage facilities are factors that could significantly add to these costs. The Western Montgomery Sewerage Facilities Plan, in addition to identifying specific impacted areas, will present a more detailed cost impact of alternative sewage facilities based on alternative sewer routes between Muddy Branch and Seneca Creek basins.

4. There are some projects in the developmental stage for which a realistic schedule of expenditures could not be developed at the time Adopted FY 85-90 CIP was formulated. The implementation of these projects is dependent upon additional actions such as service request, further evaluation of need, etc.

COST FOR PROJECTS RECOMMENDED IN THE GAITHERSBURG VICINITY MASTER PLAN
PARKS

Facility Type, Name and Location	Project Description	CIP Status[1]	Estimated Total Project Cost (1984 Dollars)
PARKS			
Local Use Parks			
Blueberry Hill Local Park	Acquisition of an additional 10 acres and additional development of an existing 10-acre local park	FY 85	$ 485,000
Centerway Community Park	Acquisition and development of a proposed 20-acre community park	FY 87	245,000
Charlene Local Park	Additional acquisition and development of a 20-acre local park	FY 90	217,000
Flower Hill Local Park	Acquisition of 10 additional acres and development of a 14.5 acre local park	FY 90	260,000
Orchard Neighborhood Park	Acquisition and development of a proposed 10-acre park	FY 90	64,000
Redland Local Park	Development of an existing 10-acre local park	FY 85	382,000
Stewartown Local Park	Additional development of an existing 13-acre local park	FY 84	319,000
Strawberry Knoll Local Park	Development of an existing 10-acre local park portion and 10-acre school portion of a 20-acre park school	FY 85	265,000
Fields Road Local Park	Acquisition and development of a 10-acre local park located west of Shady Grove Road and south of Fields Road	--	270,000[2]
Stream Valley Parks			
Cabin Branch Stream Valley Park	Acquisition of 42 additional acres	Acquisition through FY 87; no development planned	544,000[3]
Great Seneca Extension Stream Valley Park	Acquisition of 1009 additional acres and additional development	FY 84 to Beyond 6-Year period	6,189,000
Mill Creek Stream Valley Park	Acquisition of 3 additional acres	Acquisition through FY 87; no development planned	--
Conservation Parks			
Green Farm Conservation Park	Restoration of an historic house on an existing conservation park	Development not currently proposed	25,000
Recreational Parks			
Gude Drive Recreational Park[4]	Acquisition and development of a proposed 161-acre park	FY 88-90	1,235,000
Muncaster Recreational Park[4]	Development of an existing special recreational park	FY 90 and beyond 6-year period	994,000
TOTAL			$11,494,000

NOTE: 1. Adopted FY 85-90 Capital Improvements Program.
2. Represents estimated future development cost only; acquisition may be through dedication at the time of subdivision.
3. Represents estimated land acquisition cost.
4. Site is located outside Gaithersburg Vicinity Planning Area, but proposed facilities are intended to serve Planning Area residents.

COST FOR PROJECTS RECOMMENDED IN THE GAITHERSBURG VICINITY MASTER PLAN
OTHER PROJECTS

Facility Type, Name and Location	Project Description	CIP Status	Estimated Project Cost (1984 Dollars)
OTHER PROJECTS			
Fire Training Facility Improvement	Provide the capability to simulate high hazard fire and rescue situations under field conditions	FY 84	$ 120,000
Gaithersburg Station 28 Heating Repairs	Provide for the replacement of the roof mounted gas fired heating and air conditioning unit	FY 85	53,000
Gaithersburg Station 8 Improvements	Replacement of the existing front driveway and the upgrading of the heating system	FY 84	140,000
Up-County Community	30,000 gross square foot of County-owned office and clinic space	FY 89	4,363,000
Upper County Community Center	Recreation center having approximately 18,000 net sq. ft. of usable floor space	FY 85	2,439,000
TOTAL			$7,115,000
GRAND TOTAL, not inclusive of all projects			$362,119,000