

Approved & Adopted Master Plan for the

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POIONAC SUBREGION

May 1980

The Maryland-National Capital Park & Planning Commission

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ABSTRACT

TITLE: Approved and Adopted Master Plan for the Potomac Subregion

AUTHOR: Montgomery County Planning Board of The Maryland-National Capital Park and Planning Commission

SUBJECT: Land Use, Transportation, and Community Facilities Plans for the Potomac Subregion.

DATE: May 1980

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- ABSTRACT: This document contains maps and supporting text of the <u>Master Plan for the Potomac</u> <u>Subregion</u> developed by the Montgomery County Planning Board. This Master Plan, which was approved by the County Council and adopted by the Planning Commission, supercedes the Master Plan for Potomac, Travilah and Vicinity adopted December 1967; and amends the "General Plan... On Wedges and Corridors" adopted January 22, 1964 and updated to 1969.

The Potomac Subregion encompasses all of the area bounded by I-270 on the east, the Potomac River on the south, Seneca Creek on the west and north, and Maryland Route 28 and the City of Rockville boundary on the north. This area totals approximately 56 square miles and is comprised of three planning areas: Potomac-Cabin John, Planning Area 29; Travilah and Vicinity, Planning Area 25; and Darnestown and Vicinity, Planning Area 24.

The Master Plan proposes to reconfirm the established low-density residential pattern of development. The highest density will occur in the vicinity of the I-270 transportation corridor; densities will be reduced as distances increase from that corridor. The major elements of the Master Plan include a Transportation Plan, Land Use Proposals, and a Community Facilities Plan. The Plan also presents a strategy for staging development in the subregion based on the provision of sewage treatment capacity and transportation capacity.

The Plan recommends an expansion of the Rural Zone areas (five acre minimum lot size) in the western part of the Darnestown Planning Area. The commercial element of the Master Plan is limited to small "Local Commercial (C-1)" shopping areas, strategically dispersed throughout the subregion in order to provide convenient access to the existing and future residents of the area.

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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.

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- (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.

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CITIZEN ACKNOWLEDGEMENTS

In the preparation of the Preliminary Draft Plan, a number of citizen groups and their officers and committee members were very generous in assisting and advising the staff about local background and conditions. The staff met innumerable times with such groups and individuals and benefited from their thinking and advance reactions to early staff proposals. Following is a list of groups who worked with the staff over the past two years during the formulation of the Preliminary Draft Plan. This acknowledgement does not imply either full or partial agreement of such groups with the recommendations of this report.

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Quince Orchard Knolls

Regency Estates Citizens Association Ridgeleigh Homeowners Association River Falls Community Center Association Save Our Streams Scotland Community Seneca Valley Citizens Association, Inc. South Tuckerman-Inverness Citizens Association Suburban Maryland Homebuilders Association

West Bradley Citizens Association West Montgomery County Citizens Association Wildwood Hills Citizens Association Willerburn Acres Citizens Association Winterset Civic Association Women's Club of Potomac Worland Civic Association

CERTIFICATE OF APPROVAL AND ADOPTION

This Master Plan for the Potomac Subregion, being an amendment to the General Plan for the Physical Development of the Maryland-Washington Regional District in Montgomery County, Maryland, and to the Master Plan of Highways within Montgomery County, Maryland has been approved by the Montgomery County Council, sitting as the District Council, by Resolution 9-723 on April 15, 1980 and has been adopted by The Maryland-National Capital Park and Planning Commission by Resolution 80-12 on May 14, 1980 after a duly advertised public hearing pursuant to Article 66D of the Annotated Code of Maryland, 1976 Supplement.

Royce Hanson, Vice Chairman

Navarre, Sécretary-Treasurer

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SUMMARY

LAND USE AND ZONING PLANS

The Potomac Subregion encompasses 56 square miles of land and it is roughly bounded by Maryland Route 28 and the City of Rockville boundary on the north, I-270 and the Capital Beltway on the east, the Potomac River on the south and west, and Seneca Creek on the west. Approximately 95 percent of the total area is zoned for residential use with 37 percent actually developed at present.

The Plan recommends that the general zoning pattern continue but makes use of zoning tools which were developed since the adoption of the last master plan. These tools include the five acre minimum lot size Rural Zone and the Planned Development Zones.

In the Darnestown Planning Area (24), the Plan recommends that approximately 1,260 acres of land currently in RE-2, R-200 and C-1 classifications be placed in the Rural or Rural Cluster Zones. The area to be placed in the Rural Zone is not a "prime agricultural area." There is, however, farmland in the area that should be preserved. The proposed rezoning will facilitate this preservation and provide for a transition between the suburban areas to the east and the prime agricultural areas to the west.

The Plan also recommends that approximately 578 acres located south of Maryland Route 28, between the PEPCO powerline and Muddy Branch, be designated suitable for a Planned Development Zone at a density of three dwelling units per acre (PD-3). This land is currently in the R-200 (20,000 square foot minimum lot size) residential classification. The Planned Development Zone is recommended as a means of increasing the supply of moderately-priced dwelling units and allow preservation of the unique and environmentally sensitive natural features in the Planning Area.

The commercial needs of the Planning Area are proposed to be met by development of a local commercial center to be located on the north side of Maryland Route 28 at its intersection with Seneca Road (Maryland Route 112). Many of the buildings on the commercially zoned land date from the mid-1800's. The Plan proposes that these structures be incorporated into the commercial center through restoration and adaptive reuse.

In the Travilah Planning Area (25), the Master Plan recommends that approximately 1,820 acres of land be designated as suitable for PD-3. This is the area currently in the R-200 zoning classification located between Dufief Mill Road and the City of Rockville boundary.

A single local commercial center is proposed for Planning Area 25 to be located at the intersection of Travilah Road and Maryland Route 28. The commercial site is bounded on the north by Maryland Route 28 and on the west by Travilah Road and is currently in the Local Commercial (C-1) classification.

Other rezonings proposed within the Planning Area are a twenty-five acre expansion of the industrially zoned stone quarry and reclassification of 212 acres south of River Road between Travilah Road and Stoney Creek Road from its current RE-2 (two acre minimum lot size) to the RE-2-C classification. This property is known as the "Pearson Farm."

Within the Potomac Planning Area (29) there are eight rezonings recommended. These encompass approximatley 1,370 acres. The rezonings effecting the largest land area include the 1,000 acre "Avenel Farm" in the Rock Run Drainage Basin, the 190 acre Gore tract between River Road and the Potomac River southeast of the WSSC water filtration plant, and the 90 acre tract owned by the Girl Scouts of America, known as Camp Rockwood. These properties are to be reclassified from their current RE-2, RE-1 and R-200 classifications to RE-2-C. Camp Rockwood is also to designated as suitable for a Planned Development Zone at a density of two dwelling units per acre. Other rezonings include:

- 1. The 1.5 acre Cooley property, currently in the Local Commercial (C-1) classification, to be rezoned to R-200.
- Approximately 13 acres in the Bedfordshire area, straddling Kilgour Branch, is recommended to be rezoned from its current RE-2 classification to R-200. A major portion of this 13 acres is to be dedicated as a part of the Kilgour Branch Stream Valley Park.
- Approximately 50 acres of the Falls Road golf course is to be rezoned from its current R-200 classification to RE-2.
- Approximatley 75 acres south of Bells Mill Road between Falls Road and Great Arbor Drive is to be reclassified from the RE-2 classification to RE-1.

5. The Plan further recommends that approximately 15 acres in the northwest quadrant of the Seven Locks Road/River Road be rezoned from its current R-200 and C-1 classifications to the Residential Townhouse classification at a density of 10 dwelling units per acre (RT-10).

One other zoning recommendation of significance effects approximately 40 acres of land in the northwest quadrant of the Falls Road/Tuckerman Lane-Falls Chaple Way intersection. This property is to remain in its current R-200 classification but is designated as suitable for the Planned Development Zone at a density of three dwelling units per acre. Other recommendations intended to increase the supply of moderate and low cost housing within the Planning Area are a possible "Public Facility Area" on the site acquired by the School Board for a proposed Bradley Junior High School and a possible increase in allowable density on a small parcel of land in the northwest quadrant of the Seven Locks Road/Tuckerman Lane intersection.

The Plan also recommends acquisition of a new stream valley park along Rock Run and acquisition and development of several local parks to meet the outdoor recreation needs identified by the "Park, Recreation and Open Space Master Plan."

POPULATION AND HOUSING FORECASTS

The 1978 population in the Potomac Subregion was 50,200; this amounts to an average density of approximately 1.40 persons per acre. The majority of these people, approximately 37,100, reside in the Potomac

Planning Area 29. There are approximately 9,100 people in the Travilah Planning Area 25 and 4,000 people in the Darnestown Planning Area 24. The population of the Subregion is forecast to increase by approximately 9 percent over the next five years, a total of 19 percent over the next 10 years, and a total of 42 percent over the next 20 years, based on current zoning and market trends.

Between 1978 and 1988, the population in the Travilah, Darnestown, and Potomac Planning Areas is forecast to increase by 19 percent or 9,500 persons. Dwelling units are expected to increase by 5,500 units, which is an increase of 43 percent over the present supply of housing units. Of these, 4,700, or 85 percent, are estimated to be single-family; 800, or 15 percent, are slated to be multi-family units. Information on recent trends in the size and age composition of the population of the Potomac Subregion is used as background data for projecting future population and housing needs.

ENVIRONMENTAL CONCERNS

The following are proposed as guidelines for new development within the Subregion:

- 1. Subdivision plans, new roads, and road widenings must conform to noise guidelines. Design modifications will be recommended as needed.
- Development is discouraged on severely limited soils, particularly where steep slopes or mature woodlands are involved. Use of low density residential zoning and clustering are encouraged to permit development on more suitable soils.

- 3. Prohibition of development on 100-year floodplains, stream valley park acquisition, implementation of policies recommended in the watershed plans for various basins, and reduction of potential development at the headwaters of streams are encouraged in order to minimize stormwater management concerns and protect watersheds.
- Future construction of new or widened roadways must be carefully reviewed to minimize negative environmental impacts.
- 5. The conservation area along Rock Run shall include all officially delineated 100-year floodplains and an additional 25 foot building restriction line.
- 6. Revisions to the Ten Year Water Supply and Sewerage Systems Plan should be guided by the staging proposals of this Plan.

TRANSPORTATION

The following are considered to be the major transportation proposals of the Master Plan. The limited number of roadway improvements will not provide a generally accepted level of traffic service. However, in the interest of preserving the semi-rural character of the Subregion, the Plan proposes to retain the two-lane cross-section for most roads, even though congestion will occur.

- 1. Seven Locks Road improvements
- 2. Montrose Road extension
- 3. Democracy Boulevard extension
- 4. Realignment of Falls Road

- 5. Maryland Route 28 widening
- 6. Public Transit Services
- 7. Bicycle and Pedestrian Facilities

IMPLEMENTATION

The primary mechanisms for implementing the Plan are though the "Ten Year Water and Sewer Plan," by adoption of the recommended Zoning Ordinance map changes and by including the recommended public facilities in the Capital Improvements Program (CIP).

Priorities for granting of sewage treatment capacities are as follows:

Stage I - All undeveloped areas zoned R-200 (halfacre) with the exception of the area bounded by Route 28, Turkey Foot Road, and Jones Lane and the area on the north side of Maryland Route 28 at Seneca Road which is recommended to retain the R-200 classification. Two other excepted areas are noted below for Stage II (Sewer Service Category 3.)

The property currently owned by the Girl Scouts of America (Camp Rockwood). (Sewer Service Category 3.)

Stage II - The Rock Run Drainage Basin. (Sewer Service Category 5.)

The two R-200 areas which drain by gravity to Piney and Sandy Branches. (Sewer Service Cateogry 5.)

- Stage III Those areas zoned RE-2-C between River Road and the Potomac River from Blockhouse Point Park to Persimmon Tree Road. (Sewer Service Category 5.)
- Stage IV Those areas which can logically and economically be served by the transmission network extensions from all of the above areas.





POLICY FRAMEWORK

PREVIOUS PLANS

1. The Cabin John Watershed Master Plan

The first comprehensive land use and zoning plan in this Potomac Subregion was the Cabin John Watershed Master Plan, adopted in June, 1957. The Watershed covers approximately 13,000 acres and includes much of the area now called the Potomac-Cabin John Planning Area (PA 29), as well as other areas now within the North Bethesda Planning Area (PA 30) and the Bethesda/Chevy Chase Planning Area (PA 35). At the time of the adoption of the plan, the wastershed was described as largely "undeveloped and sparsely populated." The general description of the area in the 1957 Plan is no longer descriptive of this watershed but is true today of the western portions of the Subregion.

A major initial impetus for the Cabin John Watershed Master Plan was the construction of a new sewer from the City of Rockville south to the junction of Cabin John Creek and Booze Creek. This sewer was expected to accelerate development of the area and generate pressure for more intense zoning. The Plan recommended that the area develop with predominantly low-density residential uses. The Plan recommended the highest densities near to what is now I-270, with a regional shopping center surrounded by multi-family residential zoning adjacent to I-270. This commercial area is now Montgomery Mall.

In addition to the regional shopping center, the 1957 plan recommended several local commercial centers so located as to serve the anticipated residential development and to minimize negative impact on such development. Several employment centers were also proposed for the watershed, all but one on the east side of I-270.

The Plan recognized the poor road system at the time: "Circulation in the entire watershed is hampered by a system of narrow, substandard roads which generally suffer from poor alignment, both vertically and horizontally. Stream crossings are relatively few and usually in poor condition, especially during the winter months." To correct these faults, the plan was most ambitious in its recommendations for new highway facilities. It anticipated the construction of the Capital Beltway, I-270, the Rockville Freeway or Outer Beltway, and Democracy Boulevard. It also recommended extending and realigning many of the then existing roads such as Bells Mill Road and Tuckerman Lane.

The Park, Recreation and School element of the plan included the Cabin John Regional and Stream Valley Parks, a community park along Buck Branch, and several locations for "Park Schools." In general, the objective of the Cabin John Watershed Master Plan was to ensure that a low density residential area could withstand anticipated pressures for more intense development and yet provide those facilities necessary to serve conveniently such development as would occur.

2. County General Plan:

The Montgomery County General Plan--"On Wedges and Corridors" was adopted in 1964 and updated in December 1969. Its purpose was to help establish overall policies for development of the Maryland-Washington Regional District and to relate these policies to the metropolitan planning framework. This Plan envisioned the Potomac Subregion as a low-density residential wedge area which would complement the developed I-270 corridor. This low density rural and semi-rural area is needed not only for asthetic reasons but also as a conservation area to protect the public water supply. It is an economic asset in that agriculture could continue to thrive and be somewhat insulated from the development pressures which affect those areas closer to the transportation corridor. The guidance of a publicly supported General Plan was intended to enhance the soundness and acceptability of subsequent detailed plans for the local area master plans, such as those for the three planning areas included in the Potomac Subregion. The 1969 General Plan is the guiding plan for the entire County except as it may be amended by the adoption of a local area master plan, a sector plan, a County-wide functional plan or, as in the present instance, by a subregional plan.

The General Plan proposes several general goals for the entire County as follows:

- Use land efficiently;
- Encourage an orderly conversion of undeveloped land to urban use;
- Protect natural resources and encourage their proper development;
- Maintain large open spaces;
- Expand opportunities for outdoor recreation;
- * Facilitate the orderly and efficient arrangement of public utilities and services;
- Provide an efficient transportation system including rapid transit;

- Encourage greater variety of living environments with "new towns" and residential clusters;
- ' Invite imaginative urban design.

The General Plan is consistent with the major regional policies of the Year 2000 Plan as developed by the predecessor agency to the present Washington Metropolitan Area Council of Governments. In summary, these are:

- Metropolitan growth should be based upon six corridors of urban development, four of them in the Maryland suburbs; (I-270 is one such Corridor)
- Downtown Washington should be encouraged to continue as the dominant employment center in the area;
- Each major corridor should be served by rapid transit and freeways making downtown accessible from all parts of the City;
- Major transit stations should provide the focus of relatively complete new communities in the corridors;
- The regional freeway network should be designed especially to handle trips for which there will be no convenient rapid transit service;
- Each new corridor community should have employment opportunities, complete community services, and a variety of housing types ranging from large estates to high-density apartments;

- Already urbanized areas should be encouraged to develop to their fullest capacity;
- Areas outside the corridors should be kept open in order to guide urban growth in the corridor pattern and conserve rural resources;
- Public policies should be coordinated to reinforce the above recommendations.

The General Plan's rural pattern recommendations (which are particularly applicable to the western part of the Potomac Subregion) have four broad purposes:

- To help make the urban pattern efficient and pleasant;
- To provide and protect large open spaces for recreational opportunities;
- To provide a rural environment in which farming, mineral extraction, fishing and other natural resource activities can be carried out; and
- To conserve natural resources and protect the public water supply.
- 3. <u>The Master Plan for Potomac-Travilah and</u> Vicinity

Background

The existing area master plan evolved from a sketch plan done in 1965 through a number of modifications, public hearings and re-drafts, culminating in the version which was finally adopted in December 1967. The boundaries of that plan were arbitrarily set between two meridians (north-south lines), the Potomac River, Route 28 and the City of Rockville boundary, for a total area of about 44 square miles. The Subregion extends this area to logical geographical boundaries: I-270 and I-495 on the east and Seneca Creek on the west; this area encompasses 56 square miles.

Potomac-Travilah was treated as a single-purpose planning unit with a predominantly low-density residential land use pattern. The commercial network was scaled to serve neighborhood and sub-neighborhood retail activities. The Potomac Village area was the focal point of this residential-commercial system. Local and regional stream valley parks were recommended throughout the area.

The plan was intended to serve regional and County needs for open space and low-density development. Adjacent planning areas are expected to provide many of the necessary community and regional amenities.

Living Areas: Only 9.5 percent of the area was developed as of 1967, with most of this in residential land use. The basic intention of the Master Plan was to preserve the characteristics of open space embodied in the low-density land use pattern in the General Plan. The plan proposed only 2.5 persons per acre as the ultimate future residential density. According to the plan, 20,000 persons were expected to live in the Potomac-Travilah area by 1980. However, by 1976, the Subregion already had a population of 45,620 as a result of the unforeseen high demand for the type of housing provided in the area.

In 1969, only 33.4 acres of the Potomac-Travilah

area's 44 square miles were zoned for commercial use; most of this was concentrated in Potomac Village. While some 275 acres were zoned for heavy industrial use this applied only to the stone quarry at Piney-Meetinghouse Road.

Because Potomac-Travilah was planned as a lowdensity residential area, the economic support for commercial facilities was not expected to be large or varied. Neighborhood and sub-neighborhood facilities were expected to be adequate to meet convenience shopping needs. In addition to then-existing Montgomery Mall, regional commercial centers accessible in the nearby I-270 Corridor were considered to be adequate for residents' comparison shopping needs.

The plan allocated approximately 70 commercial acres to serve the projected Potomac-Travilah population of 70,600; these are divided into sub-neighborhood and neighborhood commercial areas, including the smaller crossroads stores which were commercially zoned. No additional industrial acreage was proposed.

The two major employment centers in 1969 were the David Taylor Model Basin operated by the U.S. Navy, and the Travilah stone quarry. The Model Basin, a federal, regionally-oriented complex, employed about 2,000 workers, most of them involved in research. The quarry employed about 90 people, mostly laborers. No additional work centers were proposed. (An employment center at Seven Locks and River Roads, shown on the Cabin John Watershed Master Plan, was removed in 1971.)

The plan attempted to protect, preserve, and improve the natural features of the Potomac-Travilah area. The plan allowed 5,200 acres for open space to serve regional, as well as local demands. Upon acquisition of the C & O Canal National Park, the federal government was expected to own 2,575 acres, about half of the total open space.

The transportation system proposed by the 1967 Plan would consist for the most part, of existing rural County and State roads. Many of the rural roads did not (and still do not) meet the minimum safety requirements for grade and alignment as required by County and State. In general, the plan recommended that the existing highway network be upgraded and rehabilitated. The Potomac-Travilah Master Plan incorporates several of the General Plan highway proposals, viz, the former Outer Beltway and the extension of the George Washington Parkway.

Initially, many community facilities and services were adequately provided for in the adjacent, more intensely developed areas. However, the plan anticipated that, as the area has become more developed, the need for community services would increase. More schools, medical facilities, a library and a fire station were identified as necessary in the future.

Zoning is the major County tool available to carry out the land use proposals. In the years since the plan was adopted, actions on local zoning map amendments have generally adhered to the land use recommendations. However, the most logical action would have been for the County Council to have enacted a comprehensive zoning map amendment (called "sectional map amendment") to avoid the complications inherent in a series of individual and sometimes conflicting local (individual) map amendments.

4. 1977 Growth Policy Report

The 1977 Growth Policy report focuses on the



Master Plan FOR THE Potomac Subregion

LOCATION MAP

THE MARYLAND - NATIONAL CAPITAL PARK AND PLANNING COMMISSION existing Adequate Public Facilities Ordinance and suggests some of the technical underpinnings of the growth management system. The report recommends that growth be more effectively managed by a County-wide staging policy which relates the carrying capacity of the public facility infrastructure to the amount of growth in the various subareas of the County (called "policy areas") rather than on a project-by-project basis. The report further recommends that "pipeline" development, i.e., development which is committed but not yet built, be taken into account when determining the amount of new development which can be accommodated by incremental improvements to the public facilities infrastructure.

In response to these recommendations, a Countywide "Comprehensive Staging Plan" (CSP) is currently being developed. The recommendations contained in the proposed CSP agree with the recommendations of this Plan.

General Goals and Objectives of the Plan

The <u>Master Plan</u> for the Potomac Subregion is built upon the policy framework established by the plans which preceeded it. The character and stability of the Subregion has been firmly established by these plans. This updated Master Plan for the Subregion embraces the goals and objectives set forth in its predecessors and recommends achieving those goals in only slightly different ways--through the use of more sophisticated analytical techniques and a number of planning and zoning tools which have developed since the earlier plan. The new Subregional Plan is based on the following objectives:

- Maintenance of a low-density residential "wedge" through the use of zoning policies which confine the most intense development to those areas which can be adequately and best served by public facilities.
- Preservation and protection of existing singlefamily neighborhoods by providing appropriate transitions between areas of different land uses and/or densities.
- Encouragement of an ecologically sensitive and energy efficient pattern of development through the use of such diverse zoning and subdivision tools as 5-acre zoning and cluster development; and by selective sequential expansion of the water and sewer service areas and the location of public and community facilities in convenient proximity to the areas which they are to serve.
- Staged development to ensure the provision of adequate public and community facilities when they are needed.
- Development of a framework for identifying and preserving historic buildings and sites in the Subregion.





BACKGROUND

HISTORY

Geology

The Potomac Subregion takes its name from the river flowing along its southern and western boundaries. In the relatively recent geologic past, following the last withdrawal of the sea from the Atlantic Coastal Plain, the Potomac River was formed from streams draining southward from the higher elevations of the Piedmont province. Erosion of softer sedimentary materials deposited on the coastal plain caused a widening and deepening of the valley as further wearing away of the crystalline rocks at the boundary between the sedimentary and crystalline rocks became more pronounced along the Fall Line.

The bedrock of the Piedmont province in the Washington Metropolitan Area is comprised of rocks of Pre-Cambrian to early Paleozoic age, both metamorphic and igneous types. In part of western Montgomery County, these rocks are overlain by sedimentary rocks of Triassic age and, in scattered areas, upland gravels of more recent age overlie the Triassic formations. Most of the Potomac Subregion includes rocks of the Wissahickon formation, mainly metamorphic schist and gneiss with some igneous intrusive rocks which range in composition from granitic to basaltic types. Within the Subregion is a large intrusive mass of serpentinite which affects the central portion of the Travilah Planning Area.

The metamorphic rocks of the region, such as schist, gneiss, and phyllite were formed from the

alteration of sandstone, siltstone, and shale, which originally were derived from material weathered from ancient, igneous rocks of Pre-Cambrian age. The alteration of sedimentary rocks by heat and pressure occurred during mountain-building periods when compressive forces, which buckled the earth's crust, caused folding and faulting of the rock strata. (Such crustal movements began in early Paleozoic time and extended into the late Paleozoic Era, covering a period of about 200 million years). Then, following a relatively stable period of crustal activity and extensive erosion, there was renewed uplift and faulting during the Triassic period. During this time a sequence of non-marine redbeds was deposited in shallow basins formed by faulting in the central Piedmont parallel to the NE/SW trending mountain ranges. These rocks are found in part of western Montgomery County and are exposed along the Potomac River from Violet's Lock westward. The Seneca sandstone, guarried for building stone near Seneca Creek, is part of this Triassic sequence of rocks known as the New Oxford formation of the Newark group. Some of the shallow Triassic sandstones in western Montgomery County are important as local aquifers, but are not sufficiently developed east of Great Seneca Creek to be important in the Potomac Subregion.

Human Settlement

Indians who lived opposite Maryland Point on the Potomac River's south side called the river by a verbal noun meaning "something brought" or "where something is brought." According to the dating of stone tools found at Seneca's Pierpoint Site, Paleo-Indians were probably living in the Potomac River Valley at least 12,000 years ago. Following a life pattern based on the rhythm of the seasons, they practiced no agriculture, had no ceramics, and hunted with crude spears.

The Indians living in the Potomac area at the time of the arrival of early European settlers belonged to the Piscataway tribe, part of the Algonquian Indian language group. Traditional division of labor resulted in women doing all "housekeeping" work, while the chief pursuit of men was subsistence hunting. The bones found in refuse pits of one Piscataway village excavation in southern Maryland reveal these people to have been indiscriminate carnivores: bison, elk, deer, wolf, beaver, duck, turkey, heron, eagle, hawk, trumpeter swan, and buzzard bones were unearthed.

At the beginning of the 18th century, Piscataway territory extended from the Wicomico River and Port Tobacco valley in southern Maryland to the Falls of the Potomac River (and possibly considerably north of that). When the European colonists first arrived, the Indians were organized into loose confederacies or empires. Constant hostility existed between the Powhatan confederacy, on the Virginia shore, and the Piscataways on the Maryland side. Even worse were the raids and wars of the Susquehannocks, a fierce Iroquiois tribe living to the north. Between 1675 and 1676, the Piscataways and other tribes joined with the Maryland provincial government in a campaign that defeated the Susquehannocks. But from then on, resentful northern Indians repeatedly attacked the Piscataways, who were finally removed to a fort in southern Maryland.

By the end of the 17th century, the Indians had killed each other off or been driven away. Soon afterward the great hardwood forests were cleared for farming by European settlers. Captain John Smith, the English settler of Jamestown, Virginia, set off to explore the Potomac River in 1608. He was in search of gold and an outlet to the Pacific Ocean. He found neither but he did map the river in the area of Little Falls. In 1629, he described the region as follows: "The country is not mountainous, nor yet low, but such pleasant plaine hils, and fertile valleys, one prettily crossing another, and watered so conveniently with fresh brooks and springs, no lesse commodious, than delightsome."

An Englishman named Henry Fleet was apparently the first European to explore the Great Falls area. He led a trading expedition up the Potomac River in 1631.

Beginning in 1714, William Offutt received land patents from Lord Baltimore for more than 3,000 acres in this area. The settlement was centered on "Offutt's Crossroads (Potomac Village)," and his descendents continued to prosper in the area throughout the 18th century. By 1879, according to Maryland Historical Society records, the village's population was 125. In 1881, the town was officially named "Potomac" by its first congressman, Major McDonald.

The location of the earliest Potomac homes is now difficult to determine. Early land records are vague, and the picture of land ownership was then, as now, in a constant state of growth and change. Most of the very early houses around Potomac Village were small log structures containing one or two rooms. Almost all of these have disappeared.

In the Potomac area, as well as elsewhere in the County, the pre-Revolutionary 18th century was a peaceful and prosperous time. The land was divided into huge estates, and slave labor was used to clear and plant the fields.

Initially, the soil and climate of the Potomac area were suitable for growing tobacco, which became the most profitable crop and the medium of exchange in the colonies. But the decreasing fertility of the soil was evidence of the debilitating effects of constant tobacco cultivation. Local planters turned to wheat, but the soil conditions worsened. The introduction of the "Loudoun system" of farming, however, and the invention of the lime spreader resulted in the revitalization of the fields. For 50 years after the Revolution, wheat was the most popular and prolific crop.

Nevertheless, agriculture continued to decline in Montgomery County where tobacco had been extensively grown. By 1840 the County was so unproductive that it was called "the Sahara of Maryland." Large families, often with as many as a dozen children, were no longer able to subsist, and many young people headed west when it was time for them to strike out on their own.

When the Europeans began to settle in the "back country," away from the waterways, they used trails followed for hundreds of years by Indians, and started the long process of widening and clearing them. There were no public roads in Montgomery County before 1774. A few crude, privately owned roads existed; these were maintained by those whose property they crossed. Road signs consisted of slashes on trees: three for a road to a ferry; two to a courthouse. MacArthur Boulevard, Persimmon Tree Road, River Road and Glen Road follow old Indian Trails. River Road was called "Tehogee Indian Trail" in 1725, and "Wagon Road" in 1748.

The County's first public roads connected Georgetown with the farmlands of the Potomac and Rockville areas. They were paid for by a 1774 Act of Assembly loan. A road leading from Georgetown to Frederick was opened, and another road from Georgetown to the mouth of Watts Branch (part of the present River Road) was begun the same year. It is said that River Road was surveyed by George Washington. Originally planned to follow the Potomac from Georgetown to Cumberland, it crossed the river at the mouth of the Monocacy and continued up the Virginia side. In 1778, a road was built from Seneca to the "new" road from Georgetown to Watts Branch. Many more public roads focused on Rockville after the Revolution, when it became the center of County government.

Seven Locks Road was one of many "wagon roads" serving the early farmers of the area. It grew in size and usage until area land owners petitioned the County to have it and other "wagon roads" designated as public thoroughfares. Almost all have now been paved; some of the more recently improved wagon roads are: South Glen Road (1953), Kentsdale Drive (1964), Tuckerman Lane (1968), Bells Mill Road (1969), and Brickyard Road (1974).

By about 1910, a Potomacite could catch a trolley at Cabin John and travel to downtown Washington. About 1913, he or she could board an electric street car at Great Falls and ride as far as Bradley Boulevard and Wisconsin Avenue in Bethesda. The track was constructed as part of an attempt to develop a suburban community along the trolley line.

President John Quincy Adams broke ground for the Chesapeake and Ohio (C&O) Canal near Little Falls on July 4, 1828. Shouting, "We must perservere" as his first stroke hit a tree root, he did so, and the crowd cheered. Three years later, the section between Georgetown and Seneca was filled with water. A total of \$11 million was spent to complete the 184½ miles that reached Cumberland by 1850.

The same day the ground was broken for the Canal, a ceremony was taking place in Baltimore that would contribute to the demise of the Canal as a successful commercial enterprise. On that day, a cornerstone was laid to mark the beginning of the Baltimore and Ohio Railroad. When the Canal reached Cumberland 22 years later, the railroad had already arrived. Plans to continue the Canal to the Ohio basin were abandoned.

Despite competition from the railroad, by 1859, the Canal was doing a thriving business transporting grain, flour, coal and farm products on 83 barges per week. A great deal of shipping originated at Seneca where abundant crops were still produced. Georgetown and Washington contained thousands of draft horses and provided a handy market for feed and forage crops. The canal operated continuously until 1923 and was permanently closed in 1924. Although much of the Canal is now mostly dry, derelict, and in ruins, it is a fine relic of America's canal-building era, and the route and most of the structures are intact.

A very productive stone quarry was located a few hundred yards upstream from the Canal's Seneca aqueduct. The stone was cut here for the old Smithsonian Institution building, the D.C. jail, and portions of the Court of Claims building at 17th Street and Pennsylvania Avenue. Many of the lockhouses and most of the aquaducts along the Canal were built of Seneca sandstone. As architectural tastes and designs changed, the market for Seneca sandstone declined, and the quarry closed around the turn of the century.

The little village of Offutt's Crossroads was inundated with soldiers four times during the Civil War. The Potomac area of those days bore little resemblance to the well-populated area of today. Great Falls and "Offutt's Crossroads" were the only points that might be recognizable. Great Falls at that time had a population of about 40. The rest of the area, except for a few mills and a string of lockhouses along the Canal, was farmland or woods.

There were few free schools in Maryland before the Civil War. Many families could not afford tutors or private boarding schools, so children received whatever education they got from their parents. A year after the end of the Civil War, the Montgomery County Board of School Commissioners designated public school districts; three of them were in the Potomac area. The teachers were paid \$85 per quarter.

Before 1900, gold was obtained in Montgomery County from placer deposits in streambeds and shafts sunk into rock. Montgomery Mine, in the vicinity of Great Falls on upper Rock Run, was reactivated in 1890. It was reported that \$8,000 in gold had been taken from the streambed over the years.

The Allerton-Ream property on the east bank of the Potomac, about three quarters of a mile above Great Falls, was worked by open cut in the contorted mica schist. At the Harrison group gold mines on Rock Run, one mile north of Conduit Road, eight or more veins were exposed where the stream cuts across the strike of the rock. Southwest of the intersection of Falls Road and MacArthur Boulevard, a deep shaft and remains of mine buildings can still be seen.

Many changes took place in the area in the post-Civil War years. Montgomery County's population was on the upswing again, the Canal and the Metropolitan Branch of the B & O Railroad boosted the local economy, and the river's Great Falls was being developed as a water resource. During the thirties, the farms in and around Potomac Village were generally productive. The area between the village and Rockville was prosperous farmland and apple orchards, but the land was less fertile between Potomac and Travilah Road.

World War II brought growth in Potomac to a temporary halt. After the war, the rush to the suburbs began. In the late 1940's and early 1950's, land developers bought up farms between Potomac Village and Rockville. A period of tremendous growth in Montgomery County began around 1950. In 1950, the County population was 164,000; it reached 580,000 by January 1973. During the 1960's the highest rate of County growth occurred; in that decade Potomac experienced a 287 percent population increase.

THE SUBREGION TODAY

Location

The Potomac Subregion is bounded by I-270 and I-495 on the east, the Potomac River on the south, Seneca Creek to the west and north, and Maryland Route 28 and the City of Rockville to the north. The entire Subregion encompasses approximately 56 square miles and is made up of three Planning Areas:

- Potomac (Planning Area 29) consisting of 20.85 square miles and extending from I-270 to Watts Branch.
- Travilah (Planning Area 25) consisting of 19.93 square miles and extending from Watts Branch to Muddy Branch.
- Darnestown (Planning Area 24) consisting of 15.24 square miles and extending from Muddy Branch to Seneca Creek.

Physical Characteristics

The Potomac Subregion is situated entirely within the Piedmont Province, a region of rolling upland topography underlain by metamorphic crystalline rocks. The surface elevation ranges from 500 feet to less than 100 feet above mean sea level. Large areas of bedrock in the Subregion are covered by a blanket of unconsolidated materials consisting of alluvial stream deposits, and saprolite, which is a product of chemical weathering of the bedrock. The Potomac Subregion also has a significant area of serpentinite bedrock which is an important mineral resource for road material. The Subregion has fairly extensive areas of shallow bedrock, alluvial soils, excessively or poorly drained surface materials and steep slopes.

Flora and fauna inventories were published for the Watts Branch, Muddy Branch and Seneca Creek watersheds in September 1974 and for the Cabin John Creek and Rock Creek watersheds in February 1978. The reports list a multitude of species, many of which are rare to the County. The most recent report lists and delineates the following seven habitat types:

- 1. Grassland;
- 2. Cultivated Land;
- Old Field Community which is land that had been recently cultivated but is now abandoned;
- Hardwoods which are characterized by trees of ten to fifty years old;
- 5. Coniferous Woods;
- 6. Marsh Land;
- 7. Wooded Floodplain.

All of these habitats are essential to the continued existence of most of the species inventoried.

Land Use

Of the total land area in the Subregion, approximately 37 percent is currently developed in residential uses, 24 percent is in resource production such as farming, and 28 percent is undeveloped. This information is shown in Table I for each of the Planning Areas.

As also shown in Table I, most of the land area within the Subregion (97.9 percent) is currently zoned for residential development. The predominant zoning classifications are Rural (5-acre minimum lot size), Residential Estate (2-acre), Residential Estate (1-acre), and One Family Detached Large Lot (20,000 square feet minimum lot size). If this zoned land were to develop to its maximum potential, an average density of approximately 3 persons per acre throughout the Subregion would result.

TABLE I

POTOMAC SUBREGION EXISTING LAND USE

Disseites	Tatal	Zanad	Used In	Dessures	
Area	Area	Residential	Residential	Production	Undeveloped
P.A. 24 - Darnestown Acres %	9,751.31 100	9,689.05 99.4	2,262.75 23.2	4,180.21 42.9	2,461.56 25.2
P.A. 25 - Travilah Acres %	12,758.77 100	12,277.56 96.2	4,409.28 34.6	3,309.02 25.9	3,880.05 30.4
P.A. 29 - Potomac Acres %	13,348.39 100	13,143.57 	6,488.78 <u>48.6</u>	1,235.53	3,713.55 27.8
Subregion Total Acres %	35,858.47 100	35,110.18 97.9	13,160.81 36.7	8,724.76 24.3	10,055.16 28.0
POPULATION AND HOUSING FORECASTS

Summary

The 1978 population in the Potomac Subregion was 50,200; this amounts to an average density of approximately 1.40 persons per acre. The majority of these people, approximately 37,100, reside in the Potomac Planning Area 29. There are approximately 9,100 people in the Travilah Planning Area 25 and 4,000 people in the Darnestown Planning Area 24. The population of the Subregion is forecast to increase by approximately 9 percent over the next five years, a total of 19 percent over the next 10 years, and a total of 42 percent over the next 20 years, based upon current zoning and market trends.

One of the most important aspects of the forecast population growth in the Subregion is the expected aging of the population. Family size throughout the country has been decreasing due to a reduced birth rate. The Potomac Subregion has also experienced an outmigration of children who had grown up in the older more established areas of the Subregion. The high cost of housing within the Subregion has exacerbated this decline since it is conducive to in-migration of families generally in later life stages, i.e., families with grown or nearly grown children, or families with more than one working member. The forecasted aging of the population of the Subregion indicates that in the future there will be a need for housing types other than the large lot, large floor area units that are most prevelant now. This expected need can be met by using the RT Zones. These zones allow construction of single-family attached dwelling units at densities of 6, 8, 10, or 12.5 units per acre. Since the RT Zones are floating zones,

i.e., zones which require a finding of compatability with existing and planned uses, they do not have to be applied by a comprehensive rezoning (sectional map amendment) but could be granted upon application by the property owners.

Between 1978 and 1988, the population in the Travilah, Darnestown, and Potomac Planning Areas is forecast to increase by 19 percent to 9,300 persons. Dwelling units are expected to increase by 5,500 units, which is an increase of 43 percent over the present supply of housing units. Of these, 4,700, or 85 percent, are estimated to be single-family; 800, or 15 percent, are slated to be multi-family units. Information on recent trends in the size and age composition of the population of the Potomac Subregion is used as background data for projecting future population and housing needs.

Recent Trends in Population Size

The population analysis of the Potomac Subregion is broken down by the three Planning Areas: Darnestown, Travilah, and Potomac. In 1970, the population of the entire Subregion was 30,395 persons, or 5.8 percent of the County's total population. Seventy-six percent of the Subregion's population lived in the Potomac Planning Area. By 1978, however, the population of the Subregion was estimated at 50,200 persons, a net increase of 19,805 individuals, or 66 percent. The major increase occurred in the Potomac Planning Area, which captured 74.0 percent of the Subregional growth. Travilah's population accounted for 18.0 percent of the increase, with Darnestown capturing only 8.0 percent.

TABLE II

POTOMAC SUBREGION POPULATION FORECASTS

Planning Area	1978	1983	1988	1995 ¹
P.A. 24 - Darnestown	4,000	4,800	6,000	7,300
% Increase		20	50	83
P.A. 25 - Travilah	9,100	10,900	13,300	15,200
% Increase		20	47	68
P.A. 29 - Potomac % Increase	37,100	39,000	40,200	44,000 <u>19</u>
Subregion Total	50,200	54,700	59,500	66,500
% Increase		9	19	33

¹ Prepared by Montgomery County Planning Board staff.

Recent Trends in Age Distribution

Comparison of the age distribution in the Potomac Subregion in 1970 with Montgomery County as a whole indicates a higher percentage of persons under 25 years of age in the Potomac Subregion than in the County (50.4 percent versus 45.9 percent). There was a higher percentage in the 25-64 year category in the County than in the Potomac Subregion (47.9 percent versus 46.6 percent). The Potomac Subregion also had a lower percentage of persons 65 years of age and over than the County.

Forecasting Methodology

Population forecasts for the County and for each individual planning area are updated annually by the Planning Board, using technical improvements such as the Demographic Model (discussed below), the 1977 Census Update Survey, and better information on supply and demand conditions. The Urban Development Monitoring System provides periodic data on a wide range of population indicators such as current building completions, current building permits, information on record plats, and preliminary subdivision plans.

The elements of the population forecasting process can be summarized as three major processes. The first estimates the current population. The next forecasts future residential construction using the information obtained from the Urban Development Monitoring System. The last process forecasts the demographic changes likely to occur in the current population and the population changes which will result from new construction.

The Demographic Model

The operation of the final process has been greatly improved by the use of the Demographic Model. The Model attempts to provide a rational methodology for estimating current population and projecting future population using demographic and housing stock data. Also, the model projects changes in the age and sex structure of the population in addition to projecting changes in housing demand.

The Demographic Model goes through the following steps:

- It begins with a base year population and adds the number of births occurring over a five-year period to women between the ages 15-44 in five-year cohorts;
- (2) It "survives" the population;
- It subtracts out-migrants by age and sex;
- (4) It calculates the number of heads of household by age, derived from information on new construction.
- (5) It adds in-migration or subtracts out-migration.

High and Low Population Projections

High and low population projection series are useful in evaluating the reasonableness of estimates that make up the accepted forecast. The high projection assumes that the level of construction in the future will closely approximate the boom years prior to the last slump in the housing market. The low projection simulates into the future the sluggish rate of activity observed in the 1973-1976 period and represents the minimum rate of growth that is likely to occur in the Potomac Subregion.

The Potomac Subregion's <u>high</u> population projection indicates an increase of 49 percent, from 50,200 in 1978 to 74,700 in 1995. Both the Travilah and Darnestown Planning Areas would attract significant increases in population, while the Potomac Planning Area is projected to increase by only 26 percent in the same time period.

The low projections for the Potomac Subregion 1978-1995, indicate that the area would only grow by 15 percent. Using the lowered growth rate assumptions, it is anticipated that Travilah's population would increase by only 3,100 persons, or 35 percent. Darnestown would also experience a lowered rate of growth; its population would increase by only 38 percent. The Potomac Planning Area, on the other hand, would be expected to experience an 8 percent increase, or 2,700 persons.

Growth Comparisons

The Planning Area forecast to have the largest population increase is Travilah, although Darnestown and Potomac are also expected to experience significant increases. Population in the Potomac Subregion is forecast to grow by 19 percent, from 50,200 in 1978 to 59,500 in 1988. This is somewhat higher than the 14 percent growth rate projected for the total County in the period from 1978 to 1988. Darnestown is slated to experience the largest percentage increase (50 percent); Travilah's population should grow by 47 percent.

Age distribution forecasts for the Subregion for 1986 indicate a higher proportion of persons under 25 years old than in the County as a whole (37.1 percent versus 35.0 percent), and a lower percentage in the 45 and over category than in the County (33.2 percent versus 35.5 percent). The 1986 percentage of the age distribution 25 years through 44 years would be almost the same for the Potomac Subregion and the County (29.7 percent versus 29.5 percent).

HOUSING FORECASTS

Housing Completions

Housing unit completion information is considered as the final item of data produced by the development process. Housing completion information is a crucial variable utilized in the forecasting of both future population and households. Vital statistics (births and deaths) and other changing demographic indicators are also necessary ingredients of the Demographic Model.

Housing completion data for the Potomac Subregion for the 1970-1977 period shows that the number of units has increased 55 percent, from 7,965 units to 12,304 units. This rate of growth is much higher than that of the total County, which increased by 22.5 percent. The Potomac Planning Area accounted for 74 percent of the residential construction which occurred in the Subregion. Most of the development in this period was single-family house construction. There was an increase of only 8.4 percent in multi-family construction.

Dwelling Unit Forecast 1978-1988

The population forecast shows that, by 1988, the Potomac Subregion would have 59,500 people. The ten-year period, 1978-1988, forecasts an increase of

TABLE III

POTOMAC SUBREGION LOW POPULATION PROJECTIONS: 1978-1990

Planning Area		1995	Net Increase	1978-1995
	1978		Number	Percent
Darnestown	4,000	5,500	1,500	38
Travilah	9,100	12,200	3,100	35
Potomac	37,100	39,800	2,700	_8
Total	50,200	57,500	7,300	15

Source: Montgomery County Planning Board staff, Special Projects Division.

TABLE IV

POTOMAC SUBREGION HIGH POPULATION PROJECTIONS: 1978-1990

			Net Increase 1978-1995		
Planning Area	1978	1995	Number	Percent	
Darnestown	4,000	8,300	4,300	108	
Travilah	9,100	19,700	10,600	117	
Potomac	37,100	46,700	9,600	_26	
Total	50,200	74,700	24,500	49	

Source: Montgomery County Planning Board staff, Special Projects Division.

TABLE V

POTOMAC SUBREGION HOUSING UNITS 1970 & 1976

		1970			1976	Change 1970-1976			
Area	S.F.	M.F.	Total	S.F.	M.F.	Total	S.F.	M.F.	Total
Darnestown	610	0	610	901	114	1,015	291	114	405
Travilah	1,498	3	1,501	2,085	3	2,088	587	0	587
Potomac	5,227	627	5,854	8,401	884	9,285	3,174	257	3,431
Total	7,335	630	7,965	11,387	1,001	12,388	4,052	371	4,423

S.F. = Single-family units and townhouses.

M.F. = Multi-family units.

Source: 1970 housing units obtained from final counts - U.S. Census of Housing and Population; 1976 housing units estimated by MCPB Staff from records of the Supervisor of Assessments for Montgomery County.

TABLE VIPOTOMAC SUBREGIONDWELLING UNIT FORECAST BY AREA: 1978-1995

Area	1978	1983	1995	Net Increase 1978-1995
Darnestown Travilah Potomac	1,112 2,323 9,649	1,512 2,923 11,449	2,170 4,440 <u>14,620</u>	1,058 2,117 4,971
Total	13,084	15,884	21,230	8,146

Source: Montgomery County Planning Board staff, Special Projects Division.

5,500 housing units or an increase of 43 percent. Estimates of the required mix of units indicate that single-family units, including townhouses, will increase by 87 percent during the ten-year period and multifamily units are forecast to grow by approximately 13 percent by 1988.

In addition to developing a forecast for dwelling unit completions for the 1978-1988 period, it is recognized that both a high and low projection series, reflecting different locational decisions and housing preferences of the projected population for the Subregion, could be useful in this study. The high projection rate assumes the same trends which occurred prior to 1974. The low rate of activity assumes that trends, observed during the slump in the housing cycle after 1974, would continue in the 1978-1988 period.

Analysis of the high dwelling unit projections for the Subregion shows that by 1995, 77 percent of the new residential activity is assumed to occur. The Potomac Planning Area would capture about 53 percent of the total dwellings to be constructed from 1978-1995. However, dwelling units in the Travilah and Darnestown Planning Areas are projected to increase by 149 and 130 percent, respectively, during this time period.

Examination of the low population projection for the Subregion, 1978-1995, suggests that 5,646 units, or an increase of 44 percent, would be constructed. Most of the new development would be located in the Potomac and Travilah Planning Areas. Darnestown would receive the fewest number of additional units.

Building Permits

The issuance of a residential building permit is the third of the normal development processes following the

POTOMAC SUBREGION HIGH DWELLING UNIT PROJECTION: 1978-1995

Planning Area	1978	1995*	Net Increase 1978-1995
Darnestown	1,112	2,550	1,438
Travilah	2,323	5,780	3.457
Potomac	9,649	14,700	5,051
Total	13,084	23,030	9,946

* Dwelling units are represented as occupied households.

Source: Montgomery County Planning Board staff, Special Projects Division.

POTOMAC SUBREGION LOW DWELLING UNIT PROJECTION: 1978-1995

Planning Area	1978	1995*	Net Increase 1978-1995
Darnestown	1,112	1,750	638
Travilah	2,323	3,690	1,367
Potomac	9,649	13,290	3,641
Total	13,084	18,730	5,646

* Dwelling units are represented as occupied households.

Source: Montgomery County Planning Board staff, Special Projects Division. obtaining of a sewer authorization and then the recording of a subdivision plat. This information indicates residential completions which could be expected within one year to eighteen months, depending on the availability of sewer in the area and also on the existing national monetary and fiscal conditions. A tabulation of the number of building permits issued in the Potomac Subregion from January through December 6, 1970 is outlined below.

TABLE VII

POTOMAC SUBREGION RESIDENTIAL BUILDING PERMITS

Planning Area	1970	1971	1972	1973	1974	1975	1976	1977	October 1978	Total 1970-1978
Darnestown	17	30	693	272	23	33	100	68	98	1.334
Travilah	22	196	135	165	29	28	113	128	108	924
Potomac	975	839	619	567	_50	125	353	965	463	4,956
Total	1,014	1,065	1,447	1,004	102	186	566	1,161	669	7,214

Source: Montgomery County Planning Board staff, from data of the Department of Environmental Protection, Montgomery County. The most noticeable trend in permit activity in the Subregion was the significant decline in the level of activity after 1973. From 1970-1973, an average of 1,133 permits were issued annually, as compared to 285 units between 1974-1976. A similar fall-off in residential permit activity was observed County-wide after 1973. Several factors are responsible for the rapid decline in residential permit activity. Some of the causes stem from high interest rates and, to some extent, the imposition of stringent sewer regulations in the County.

A review of building permit activity by planning areas shows that the Potomac Planning Area received the majority of permits (69 percent) issued in the Subregion from 1970 through 1978. Darnestown followed with 18 percent of the activity, while Travilah trailed the other areas, capturing 13 percent of the activity.

Subdivision Activity

Trends in subdivision plat recordings provide analysts with valuable information which can be utilized for forecasting residential development. After sewer authorizations are obtained, then plats may be recorded. As the second stage of the development process, plat recordings are an indication that land is slated for immediate development after the building permits are issued. Sewer hookups or septic approvals are other required permits.

The plats recorded from 1971 through the 1978 period in the Potomac Subregion were for 5,365 dwelling units. Plat recordings maintained a steady pace between 1971 and 1973, but plunged steeply in 1974 as the monetary situation tightened. This decrease in activity followed the overall County pattern.

In 1975, there was a resurgence of activity due to the increased availability of sewer in certain parts of the County. However, for the first six months in 1976, recordings dropped to the 1974 level. This fall-off in activity was due to the difficulties experienced by builders in obtaining mortgage financing for their projects and also, to some extent, reflects the changing sewer situation.

Information on outstanding County-wide sewer commitments, as of August 1978, indicates that 9.2 percent, or approximately 4,135 are located in the Subregion. Of this amount, a majority were situated in the Potomac Planning Area.

TABLE VIII

POTOMAC SUBREGION SUBDIVISION ACTIVITY (RECORD PLATS): 1971-1978

Planning Area	1971	1972	1973	1974	1975	1976	1977	1978	Total
Darnestown	233	355	59	39	198	30	188	64	1.166
Travilah	232	313	30	41	57	22	100	138	933
Potomac	637	283	778	26	459	140	352	<u>591</u>	3,266
Total	1,102	951	867	106	714	192	640	793	5,365

Source: Data obtained from the Record Plat File of M-NCPPC.

TABLE IX

POTOMAC SUBREGION OUTSTANDING RESIDENTIAL SEWER COMMITMENTS, AS OF AUGUST 1978

Planning Area	WSSC ¹ Authorizations	ISSP Authorizations	Rock Creek Consortium	Total
Darnestown	143		219	362
Travilah	129	398	91	618
Potomac	1,683	727	745	3,155
Total	1,955	1,125	1,055	4.135

¹ This category includes authorizations granted before ISSP, in addition to the ISSP allocations which have reached the authorization stage.

MARKET ANALYSIS

Summary

The amount of retail floor space for all types of goods which could be supported within the Subregion is expected to increase from a 1977 level of 912,000 square feet (as compared to the existing 1,488,050 square feet) to 1,527,900 square feet by the year 2000. These figures include both convenience goods--i.e., perishable items such as groceries, drugs, etc., and "shoppers' goods," i.e., durable goods such as appliances, furnishings, etc. The amount of retail floor space for convenience goods, which could be supported due to development within the Subregion, is expected to increase from 317,500 in 1977 to 513,900 square feet, or approximately 40 percent, by 2000. The existing floor space devoted to convenience goods is approximately 331,050 square feet.

The amount of supportable floor space for shoppers' goods is expected to increase a proportionate amount. It should be noted that once a property is placed in the Local Commercial (C-1) zoning classification any of the uses permitted in that zone may be placed on that property. The division of space within a commercial facility between convenience goods, shoppers' goods, and office space is then the prerogative of the owner and/or developer of the facility and cannot be regulated by a master plan.

Methodology

The approach used to forecast supportable square footage of retail space is based on the 1977 Census of Retail Trade for Montgomery County as compiled by the U.S. Department of Commerce, Bureau of the Census. Only County-wide data is available to date.

The portion of retail sales usually attributed to stores in shopping centers is divided into three categories--convenience goods stores, primary shoppers' goods stores, and secondary shoppers' goods stores. Convenience goods stores are most often found in neighborhood centers and serve the everyday needs of nearby population. Such stores include food stores. pharmacies, liquor stores and hardware stores. Primary shoppers' goods stores are usually found in regional shopping centers and central business districts, although occasionally they are also found in neighborhood centers. Examples include stores selling general merchandise (department and variety), apparel, and specialty goods. Finally, secondary shoppers' goods stores include restaurants, furniture stores, home appliance and high fidelity stores, and auto and home supply. These stores are more "footloose" than the other two types and may often be free-standing as well as in shopping centers of various sizes.

Retail sales can be related to three major factors--people, households, and income. Some expenditures are made by individual decision makers; others are for the benefit of the household as a whole. In either case, income is an important factor.

The analysis done for this Plan utilized an average of these three factors as reported in 1977; per capita retail sales, per household retail sales, and household/income-related sales.

Convenience goods stores sales in 1977 were \$3,739 per household, \$1,246 per person, and about 11.6 percent of the total family income. Shoppers' goods stores sales (primary and secondary) were \$5,222 per household, \$1,740 per person, and about 16.2 percent of total family income. The above figures are for the entire county.

For analysis of the Potomac Subregion, the above figures were adjusted using a ratio of median household income for the Subregion to County-wide household income as calculated in the 1977 Montgomery County Census Update Survey. It was assumed that, in the future, this ratio would remain constant. Also, sales per square foot in all retail stores are assumed to increase in line with per capita and per household income, real as well as inflationary increases, through the year 2000.

Finally, retail sales in dollars, calculated by using each of the above factors, were adjusted by sales per square foot in order to obtain the square feet of supportable retail space. The sales in dollars per square foot of retail space were derived from <u>The Dollars and</u> <u>Cents of Shopping Centers</u> for 1978, which reflects 1977 data.

Retail sales expenditures in Montgomery County in 1974 were estimated to be \$1,812,109,000. Data indicates that retail sales activity increased 25.0 percent in real terms between 1972-1974 in the County; this suggests there was strong market support for thenexisting retail facilities.

The higher income households in the Subregion are expected to support a significant share of the retail sales market. It is not recommended that any new regional shopping centers (which merchandise primarily "shoppers' " goods) be located in the Subregion. However, "convenience" outlets such as supermarkets, specialty shops and community-oriented retail outlets are considered to be entirely suitable and needed to serve the community in modest-sized local shopping areas. It should be noted that a significant percentage of the forecasted demand in the Potomac Subregion, particularly the demand for "comparison" or "shoppers'" goods will be satisfied by existing and planned regional shopping facilities located in the Rockville and I-270 Corridors.

The 1978 median household income for the Potomac Subregion is estimated to have been \$39,420. The estimated 1978 County average household income is computed at \$31,000. Estimated aggregate household income in 1978 for the Potomac Subregion is \$507,736,700. Of this amount, the Potomac Planning Area accounts for 77.6 percent, and Travilah produces about 17.0 percent. Data suggest that 38 percent of household income is generally spent on retail goods, therefore, total retail expenditures in the Potomac Subregion in 1978 are estimated at \$192,940,000.

Based on data indicating that convenience goods comprise 32.8 percent of total retail sales, the magnitude of such retail expenditures in the Potomac Subregion in 1978 is estimated to be \$63 million. The Potomac Planning Area is expected to account for 77.6 percent of the total Subregional expenditures on convenience goods; Travilah and Darnestown will, respectively, account for 17.0 percent and 5.4 percent.

An analysis of total market demand for retail facilities must also include estimates of "shoppers' " goods expenditures, as well as the necessary space requirements in the Potomac Subregion. Currently, shoppers' goods expenditures comprise 41.9 percent of retail expenditures. Households in the Potomac Subregion spent an estimated \$81 million in 1978 on shoppers' goods.

Data indicate that the Potomac Planning Area would have accounted for about 77.6 percent of the total 1978 shopping goods expenditures in the entire Subregion. Travilah would have accounted for 17.0 percent, and Darnestown, 5.4 percent.

A significant amount of floor space, devoted to shoppers' goods, already exists in Montgomery Mall which is located in the Subregion. Also, some of the area's shopping goods demands are being satisfied by facilities in the Rockville Transit Corridor. This pattern is expected to continue in the 1978-1988 planning horizon.

The 1988 demand for convenience and shoppers' goods in the Potomac Subregion area will depend primarily on the economic and demographic trends in the 1978-1988 period, including the level of real income increases (in constant 1978 dollars). Household growth will probably outpace population growth, with the former expected to experience a 41.9 percent increase versus a 19.0 percent increase in population in the 1978-1988 period. Aggregate real income increases are dependent on both the increase in the number of households and the changes in real household income in the Potomac Subregion. Real aggregate income is estimated to experience an 82.0 percent increase, from \$507.7 million to \$923.6 million.

The anticipated expansion of shopping goods facilities within the Rockville Transit Corridor and the Gaithersburg Planning Area by 1988 will obviate the need for additional shopping goods facilities within the Subregion. Trips for shoppers' goods normally are relatively infrequent and, therefore, need not be conveniently located in the community. However, convenience goods may require several trips per week by each household and, therefore, should be relatively handy to every household. This locational policy for convenience retail centers is necessary in order to minimize aggregate vehicle miles of travel.

TABLE X

POTOMAC SUBREGION SUMMARY OF FORECASTS 1978-1988

	<u>P</u>	OPULATION		
			Change	1978-1988
Planning Area	<u>1978</u>	<u>1988</u>	Number	Percent
Darnestown	4,000	6,000	2,000	50
Travilah	9,100	13,300	4,200	47
Potomac	37,100	40,200	3.100	9
Total	50,200	59,500	9,300	19
	HO	USING UNITS		
			Change	1978-1988
Dwelling Units	1978	<u>1988</u>	Number	Percent
Darnestown	1,112	1,912	800	72
Travilah	2,323	3,623	1,300	56
Potomac	9,649	13,049	3,400	36
Total	13,084	18,584	5,500	43

TABLE X (Cont'd.)

	RETAIL FACILITIES (SQUARE FE	ET)	
	Convenience Goods		
Planning Area	Existing ¹ 1979	Suppor 1977	rtable 2000
Darnestown Travilah Potomac	35,100 20,300 <u>275,650</u>	22,000 54,000 <u>241,500</u>	50,900 116,000 365,000
TOTAL	331,050	317,500	531,900
	Shoppers' Goods (Primary & Second	lary)	
Planning Area	Existing 1979	Suppor 1977	rtable 2000
Darnestown Travilah Potomac	0 0 1,157,000	41,100 101,100 452,300	95,200 217,300 683,150
TOTAL	1,157,000	594,500	996,000

¹ Excluding space used for offices.





ENVIRONMENTAL ASSESSMENT

SUMMARY

- Subdivision plans, new roads, and road widenings will be reviewed for conformance with noise guidelines. Design modifications will be recommended as needed.
- Development is discouraged on severely limited soils, particularly where steep slopes or mature woodlands are involved. Use of low density residential zoning and clustering permit development on more suitable soils.
- 3. Actions contributing to the protection of streams and watersheds include prohibition of development on 100-year floodplains, stream valley park acquisition, implementation of policies recommended in the watershed plans for various basins, and modification of certain land use proposals to reduce headwater development impacts on streams.
- Future construction of new or widened roadways will be carefully reviewed to determine how the environmental impacts identified in this Plan can be minimized.
- Strengthen the 200 foot wide conservation area designated along Rock Run to include all officially delineated 100 year floodplains and a 25 foot building restriction line.
- Revisions to sewerage service staging in the Ten Year Water Supply and Sewerage Systems Plan should be guided by the staging proposals of this Plan.

NOISE

1

2

Roadway

Peak roadway noise levels were calculated using a program developed by the Federal Highway Administration (FHWA), and field-checked for a confirmation of findings. According to FHWA policy the maximum acceptable noise level for residential areas is 70dBA L_{10} .¹ This noise descriptor best reflects the "peaking" conditions associated with the high percentage of trucks using I-495, I-270, and the roads leading to the Travilah Quarry.

Another important indicator of community reaction to noise is the day-night average sound level (L_{DN}) ,² which reflects the total dose of sound of a particular location. Both the Environmental Protection Agency (EPA) and the Maryland Department of Health and Mental Hygiene have established 55 dBA L_{DN} as the noise guideline (goal) for residential areas.

Residential areas where adverse impacts occur are south of Stone Trail Drive and Hamilton Spring Road north of the Beltway; the east end of Carteret Road, Shadywood Road, and Glennon Drive west of the Beltway; and the east end of Thomas Branch Drive west

L_{DN} - A weighted equivalent sound level for a 24-hour period with 10 decibels added to nighttime sounds (10 PM to 7 AM) to account for the greater degree of distraction experienced at night while trying to sleep.

L₁₀ - A weighted sound level exceeded 10 percent of the time in the peak traffic hour.

of I-270, along Travilah Road between Piney Meetinghouse Road and Route 28; and along Route 28.

Additional calculations at these locations could determine exact noise levels at individual houses, and the extent and cost of roadside barrier attenuation required to bring these areas into conformance with recommended criteria.

In their 5 year program, the State Highway Administration has included an abatement project along I-495 between River Road and Bradley Boulevard. Construction is scheduled to begin in 1984. In addition the Maryland State Police have begun to enforce noise controls by ticketing vehicles exceeding standards.

Quarry Noise

Existing and potential noise from the rock quarry on Travilah Road is from two sources: mining operations (such as rock crushers) and truck traffic along the haul route. According to several recent studies, mining noise is substantially contained within the pit and although operations can be heard above the rural background, the frequency and intensity is low enough to preclude significant problems to residential areas, with the possible exception of the lots directly across Travilah Road.

Haul route noise can be very intense and generally lasts from 7:00 A.M. to 5:00 P.M. Measurements of noise peaks due to individual trucks, taken fifty feet from Travilah Road, resulted in readings as high as 89 dBA. Although traffic volume on Travilah Road is low, the high percentage of heavy trucks using the road produces noise levels up to 55 dBA approximately 900 feet from the roadway. Whenever possible, new residential construction should be set back from the roadway or placed behind appropriate noise attenuation devices to reduce annoyance.

Aircraft

The Potomac Subregion contains portions of the approach control zones of both Dulles International and Washington National Airports. Two major jet paths cross the study area at altitudes greater than 1,600 meters (1 mile). The majority of air traffic to Dulles Airport, including the Concorde flights, approaches north of the study area and, therefore, generates little noise in the Potomac Subregion.

A flight path from Washington National Airport follows the Potomac River north to the Beltway (I-495). Recent Federal Aviation Administration (FAA) data indicate that Noise Exposure Forecast (NEF) 30 contour lines extend only as far as the District of Columbia boundary line with Montgomery County. The noise limitations set by the Maryland State Aviation Administration are not exceeded in the Potomac Subregion.

However, frequent fly overs can cause outdoor activity interference and annoyance in some locations. The County supports a plan which would reduce the number of flights out of National and restricts the flight path along the River.

Maryland Environmental Noise Act

It is generally accepted that noise above certain levels is harmful to the health of humans, causing loss of sleep (above 45 dBA interior level), speech interference (above 55-60 dBA), hearing impairment (above 70 dBA continuous), and other psychological and physiological problems.

In recognition of the effects of noise and in response to the requirements set forth by the Environmental Noise Act of 1974, the Department of Health and Mental Hygiene has established noise goals for various zoning categories. Since high noise levels restrict certain types of human activity, each land use category has an empiracally determined limit which should not be exceeded if the land use is to maintain its proper function and protect the public health and welfare.

These goals should be achieved through application of regulations relating to land use management, as well as isolation of noise producing equipment, and equipment modification. These goals and legal limits are as follows:

Zoning Category	Goals		Limits Effective January 1, 1980	
	Level	Measure	Day	Night
Industrial	70 dBA	L _{eq} (24)	75 dBA	75 dBA
Commercial	64 dBA	LDN	67 dBA	62 dBA
Residential	55 dBA	LDN	60 dBA	50 dBA
Leq (24)	represent	ts an all d	ay, 24-hou	ur average

noise level. L_{DN} represents the day-night average

The Montgomery County Noise Ordinance also has established 55 dBA as the limit at residential property lines. The County has established a 62 dBA limit at commercial and industrial property lines which is more restrictive than the limits established by the State.

In order to achieve the state standards, the Department of Health and Mental Hygiene of Maryland has adopted regulations enforceable by a penalty of up to \$10,000 per day for exceeding the limits specified.

Construction limits, frequency of occurrence, and exemptions are also provided for under the regulations. This description of the Noise Act regulations is included in this Plan, as is required by state law. The law also requires that the maximum allowable levels be shown on the adopted master plan.

Noise Recommendations

The Potomac Subregion Plan defines "noise impact areas" along the main highways in the area based on State of Maryland and Federal EPA noise guidelines. These zones are areas inside the 55 decibel contour line, based on projected traffic volumes and do not account for existing or proposed natural or man-made buffers.

These guidelines can be achieved through the use of setbacks, buffer areas, berms, walls, or vegetation. Where exterior levels cannot be practically achieved, interior levels of 45 decibels should be met through the use of acoustical insulation and site design.

In order to meet the noise guidelines described in the Plan, the following measures will be implemented:

- Design of new highway construction (such as Md. 28) will be reviewed with the State Highway Administration to incorporate noise reduction measures into the plans.
- 2. Residential and commercial preliminary sub-



POTOMAC-CABIN JOHN AND VICINITY P.A. 29

NOISE IMPACT AREAS



Areas Exposed To L10 Values Of 70 dBA Or Greater Due To Traffic Noise

Areas Exposed To L_{DN} Values Of 55 dBA Or Greater Due To Traffic Noise

******* Planning Area Boundary



TRAVILAH AND VICINITY P.A. 25

NOISE IMPACT AREAS

Areas Exposed To L₁₀ Values Of 70 dBA Or Greater Due To Traffic Noise

Areas Exposed To L_{DN} Values Of 55 dBA Or Greater Due To Traffic Noise



Area Potentially Exposed To Noise Levels Of 55dBA And Above Due To Quarry Operation

division plans and site plans will be reviewed for conformance with noise guidelines.

- 3. The County will continue to support a reduction of flights into National Airport as a means of reducing excessive noise along the Potomac River.
- 4. The Department of Environmental Protection will assure that noise producing activities such as trash removal and ventilating fans conform to the County Noise Ordinance.

Calculated noise levels are shown on Maps number 2 and 3.

AIR QUALITY

Air quality in most of the Potomac Subregion generally meets the National Ambient Air Quality Standards. The carbon monoxide standard is exceeded at several locations along major roads, but these localized CO "hot spots" are temporary and will be significantly reduced as a result of federal vehicle emission controls. By 1981, no CO violations are expected to occur, with the exception of areas immediately adjacent to the Beltway (I-495). By 1986, all background CO levels are expected to meet federal standards. Ambient air quality levels are shown on Maps 4, 5 and 6.

SOLID WASTE

Most of the Potomac Subregion is served by private solid waste collectors. There are two County tax-supported collection areas: one roughly follows Seven Locks Road from the Potomac River area north to Bradley Boulevard; the other falls within the general vicinity of the Potomac River, between Persimmon Tree Road, and Falls Road. There are also two collection districts in the region: one west of Rockville, generally straddling Glen Mill Road; the other an area west of Seven Locks Road between Persimmon Tree Road, Falls Road, and Bradley Boulevard. Either public or private collection of solid wastes is mandatory for all residential, commercial, and industrial uses in the County. Disposal has been to the County landfill on Southlawn Drive since 1975, when the Southlawn incinerator closed.

Solid waste contributions from the Potomac area represent a minimal portion of the total disposal requirements for Montgomery County.

NATURAL SYSTEMS

The Potomac Subregion has large areas of thick, well-drained soils which are generally well suited for development. However, nearly one-third of the total area has construction limitations because of either shallow bedrock or alluvium (water deposited soils). In addition, areas of steep slopes, and excessively or poorly drained soils are present in some areas. Approximately 38 percent of the analysis area is covered with mature trees.

Areas of very poor suitability for construction (due to steep slope; shallow soils, and alluvium) are generally found adjacent to the Potomac River, Seneca Creek, Cabin John Creek, Muddy Branch, Watts Branch, and Rock Run. A large area of ultramafic formation (serpentinite outcrop) which is traversed by Piney Meetinghouse Road is poorly suited for development due



POTOMAC-CABIN JOHN AND VICINITY P.A. 29

AIR QUALITY

1976 CO-8 DISPERSION, BACKGROUND LEVELS





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AIR QUALITY

1976 CO-8 DISPERSION, BACKGROUND LEVELS





DARNESTOWN AND VICINITY P.A. 24

AIR QUALITY

1976 CO-8 DISPERSION, BACKGROUND LEVELS



to shallow and poorly drained soils. There is also a fairly extensive area west of Darnestown which has thin and excessively drained soils.

The areas of poorly drained and excessively drained soils are poorly suited for septic field operation due to possible groundwater contamination. The remainder of the Subregion provides generally fair to good construction opportunities and is characterized by soils derived from schist or gneiss formations which are generally thick and well-drained. These conditions are depicted on the Soil Suitability Interpretation Maps 7, 8, and 9.

Much of the Potomac Planning Area is within the 10-Year water and sewer envelope. Most of the land outside the water and sewer envelope within this Planning Area is located in areas of thick, well-drained surface materials and is usually suitable for septic tank operations.

WATERSHEDS

Long before Europeans arrived at the confluence of the "Potowmack" and the Anacostia Rivers, the Indians were well supplied with water from the many brooks and springs in the area. At present, the Potomac River is the only stream within the Planning Area used as a public water supply. The Potomac River's tributaries and their watersheds in the Subregion are shown on Map 27 and are described below.

The surface water and surrounding woodlands of stream valleys have a direct impact on wildlife, water quality, and atmospheric temperature, in addition to providing recreational opportunities. The stream valleys form a permanent, stable habitat, and contribute to an ecologically stable natural environment. The Cabin John Creek Watershed, which is about 25 square miles in extent, has undergone extensive urbanization in the past three to four decades. The normal stream flow varies from two to 20 cubic feet per second at its mouth. The stream bed is mostly sand and gravel, with rocky outcrops and rock formations occurring along the lower reaches of the stream. This creek falls about 400 feet in elevation in the eight miles between its headwaters and the Potomac River. A number of long pools, followed by shallow rapids, are noted along its course. The creek is well shaded by large trees for almost its entire length. The underlying geologic formation of the Cabin John Creek Watershed is almost entirely the Wissahickon Formation, composed of albite-chlorite-muscovite-quartz schist.

A sanitary sewer has been constructed alongside the stream and has a history of raw sewage overflow problems at a point approximately one-third of a mile upstream from the Potomac River. The water quality of Cabin John Creek has been rated as poor, based on a measured bi-weekly mean of Biological Oxygen Demand (BOD), phosphate, total coliform density, and fecal coliform density. An inventory of the fishes of Cabin John Creek led to the conclusion that land use changes in the area directly correlate with the number of fish species found. A number of once common species are conspicuously absent, among them species especially sensitive to poor water quality.

For descriptive purposes, the Cabin John Stream Valley can be reduced to five major segments as follows:



POTOMAC-CABIN JOHN AND VICINITY P.A. 29

SOIL SUITABILITY*



····· Planning Area Boundary

* Base data from the Montgomery County Soil Survey



TRAVILAH AND VICINITY P.A. 25

SOIL SUITABILITY*



······ Planning Area Boundary

* Base data from the Montgomery County Soil Survey



DARNESTOWN AND VICINITY P.A. 24

SOIL SUITABILITY* INTERPRETATION



····· Planing Area Boundary

*Base data from the Montgomery County Soil Survey

MacArthur Boulevard to River Road. This twomile segment of the Stream Valley lies between I-495 and Cabin John Parkway on the east and Seven Locks Road on the west. Parkland extends to a maximum width of 1,400 feet. The park area is divided by the I-495 crossing.

Two factors have altered the terrain and the biotic environment of this part of the stream valley. The first is the construction of a sewer line some years ago. The main plant species covering the sewer line are grasses and lespedeza. The second factor is highway construction: Cabin John Parkway and a portion of I-495 parallel to the stream on the west side. The Parkway runs to within 100 feet of the stream at several points, and all of the Parkway drainage flows into the creek. During heavy runoffs considerable erosion and siltation result.

Some extremely steep, rocky slopes, especially along the west bank, have necessitated the construction of stone masonry rip-rap to control bank erosion. On the creek's east side, an informal trail begins at the Seven Locks Road bridge over the stream. From this hilly, wooded area the path extends along the sewer line to the marshy area immediately north of the I-495 crossing. The area just south of I-495, on both sides of the creek, contains a number of horse trails, all originating west of Seven Locks Road. Some of the parkland adjacent to Seven Locks Road has been used as a dump. With the help of vigilant citizens, the County should step-up its enforcement of anti-dumping regulations in this case. The Park Department should clean up the debris and devise means to frustrate future access by violators.

River Road to Bradley Boulevard. This segment of the stream valley is almost two miles long. It is surrounded by urbanized areas except for the portion near Seven Locks and River Roads, where extensive quarrying operations exist. The floodplain between Bradley Boulevard and River Road is narrow and is less than 100 feet wide in a few areas. The stream is fastflowing, with exposed rock formations present all the way. The slopes along the west side of the creek are very steep. There are about five quarry sites along an old quarry road.

As the stream approaches within 1,500 feet of River Road, all life disappears. Tons of debris have been dumped on the floodplain. A truck road entering this area from River Road is used illegally by trash haulers to dump trash on both parkland and private land. There is also a dirt access road on the west side of the creek; this, too, has been used by trash haulers who illegally dump loads of trash on parkland. The narrow strip of parkland between River Road and Cabin John Creek has been used as a dumping ground for concrete, piles of rock, abandoned vehicles, and other refuse.

Bradley Boulevard to Democracy Boulevard. The creek basin in this 1.7 mile segment of stream is characterized by steep wooded slopes on both sides, with relatively narrow floodplain areas. One extensive floodplain is on the north side of the creek, above the Buck Branch confluence; another is upstream from Bradley Boulevard on the west side.

Downstream from Buck Branch, along the west branch, is a well-defined, open trail used by hikers and cyclists, both motor and bicycle. Motorcyclists are considered an undesirable intrusion in the community as their activities have led to moderate levels of erosion on hilly portions of the routes.

Democracy Boulevard to Tuckerman Lane. This

1.5 mile segment varies in width from 0.7 mile to 0.26 mile. Exclusive of the developed portions of the park and the power line bisecting the stream valley, the stream valley park is virtually all hardwood forest. The largest segment of floodplain in this segment of the park, approximately 10 acres, is located south of the power line.

Informal trails follow both sides of the branch to Seven Locks Road and to the Scotland community, south of this branch. Several heavily-used trails extend from the Scotland community to the urbanized area to the south. These downhill trails show the beginnings of erosion; there is evidence that motorcyclists are using these trails.

In one open area along the stream, there is a considerable growth of green algae which is evidence of stormwater runoff from well-fertilized lawns in the surrounding residential area.

<u>Tuckerman Lane to Montrose Road.</u> This segment of the stream valley is bounded on the east by I-270 and on the west by a largely urbanized area. It is covered with a mixed, second growth, hardwood forest. Several solid stands of mature Virginia pines have survived on the western slopes.

Buck Branch of Cabin John Creek

This branch extends in a northerly direction from its confluence with Cabin John Creek below Democracy Boulevard to its source near Willowbrook Drive. The stream valley included in the park is from 750 to 1,000 feet in width in the lower portion and less than 500 feet wide above Bell's Mill Road. The surrounding area is fully urbanized. The stream valley is completely wooded. The lower part of this stream valley, largely floodplain, was once crop or pastureland, and reverted to brush a decade or longer ago. Algae growth in the stream has been noted at several points. This is probably the result of runoff waters carrying dissolved lawn fertilizers. An informal trail on the east bank, developed and used by local residents, is clear and open more than 80 percent of the way from Bell's Mill Road to Willowbrook Drive. It is overgrown only for a short distance south of Powder Horn Drive up to the miniature waterfall.

Many residents of Powder Horn Drive have landscaped the park areas to the rear of their properties. This tends to enhance the attractiveness of the parkland provided access for the general public is not affected.

Western Branch of Cabin John Creek

This major tributary of Cabin John Creek, which drains about five square miles of land, extends northwestward 2.9 miles from its juncture with the main stream above River Road to its source a short distance north of Kentsdale Drive. Only the lower-most 1,200 feet of this stream valley is proposed to be parkland. Western Branch has a narrow floodplain exceeding 100 feet in width in only a few places.

Both sides of the stream are urbanized up to the Kendale Road area for a distance of 1.2 miles above its confluence with the main stream. The remaining 1.7 miles of the stream valley are almost all wooded on both sides. A large area of pastureland is located on the east side near Kentsdale Drive; the west bank is urbanized. The stream valley shows extensive use by equestrians and motorcyclists above Kendale Road. The trails cross the stream many times, creating serious erosion problems.

Watts Branch

The Watts Branch Watershed is located in the south central portion of Montgomery County and extends in a southwesterly direction from the City of Rockville to the Potomac River. The watershed occupies approximately 22 square miles. Its general boundaries are River Road on the south, Travilah and Shady Grove Roads on the north and west, Rockville Pike on the north and east, and Falls Road on the east.

The southwest portion of the watershed is mainly rural-residential, the central portion is residential, and the northeast portion, comprising western Rockville, is urban. Industrial development, for the most part, is concentrated in industrial parks located along I-270 outside of the Subregion. A large quarry operation exists in the west central portion of the watershed. The majority of rural residences are served by septic systems.

Erosion from increased flow rates caused by urbanization is enlarging the stream channels in order to accommodate higher flows. Soil eroded from the channels is being deposited in lower stream reaches or is being carried into the Potomac River.

Located in the Piedmont Plateau, the watershed's topography is primarily rolling and has a general slope from the northeast to the southwest. The highest point in the watershed is approximately 550 feet above sea level, and the lowest is about 170 feet. Watts Branch and its principal tributaries, Sandy Branch and Piney Branch, drain the watershed in a southward direction to the Potomac River.

The natural vegetation of the watershed is mainly hardwood forest, dominated by white and red oaks, and comprises about 30 percent of the entire area of the basin. Soil characteristics of the area are such that the watershed has a moderate to very high runoff potential.

Watts Branch contains a diversity of fish species. It appears, from the limited historical data available, that the distribution of native fish species has remained rather constant for the past 60 years. However, Watts Branch does contain fishes which have been listed as rare or depleted in Maryland in the paper <u>Threatened</u> <u>Freshwater Fishes of the United States</u>. Lesser deterioration in native fish fauna has occurred in the Western Watts Branch headwaters.

Storm Runoff Problems. Land use changes accompanying urbanization and inadequate agricultural conservation practices have significantly effected the quantity and quality of storm runoff within the watershed creating flooding, channel erosion, sedimentation, and degradation of water quality.

Two basic hydrologic modifications affecting runoff quantities and streamflow characteristics are involved in the urbanization of a watershed. First, part of the watershed is covered by impervious surfaces which prevent rainfall from penetrating the soil, causing more of it to run off instead. Second. construction of efficient runoff collection and conveyance systems alter the network of flow paths by which surface runoff reaches streams. These alterations increase the total volume of runoff and also speed up its arrival at the receiving stream. This phenomenon is important since, during local storms, Watts Branch peaks ahead of the Potomac. WSSC's filtration plant is located just downstream of the mouth of the Branch. Thus, during localized storms, Watts Branch may contribute significant amounts of sediment load reaching the filtration plant.

The hydrologic response of the Watts Branch Watershed was studied through a mathematical stormwater evaluation model called "MOSEM." Disparities in existing flows are the direct result of urbanization in various parts of the watershed. Fortunately, because development in the stream's floodplains has been minor, property damage caused by flooding has, for the most part, been minimal to the present. Recently, however, the flooding of property has been increasing in magnitude and frequency, and is becoming a problem in certain areas.

Reaches of Watts Branch and its tributaries, Kilgour Branch and Piney Branch, show evidence of unstable and unvegetated banks, scoured or muddy channel beds, excessive debris accumulations, and disturbances in natural stream biota. The severity of streamflow quality degradation is a function of the type and extent of local development and the type of runoff quality-control measures that are employed.

The lack of long-term water quality records for the Watts Branch Watershed has hampered attempts to measure accurately the effects of previous development on water quality in the study area. A limited amount of short-term data collected by the County Department of Environmental Protection indicated that overall water quality was "good" in the watershed in 1972 and "excellent" in 1973. These data result from grab samples and, in general, do not indicate the increased pollutant levels in storm runoff.

Agricultural land use is a source of pollution that cannot be overlooked. The problems of runoff from crop and pasture lands, animal feedlots, and leachate from fertilized fields are not new, but they have become more noticeable due to increased specialization and intensification of agricultural activites. Unfortunately, limited specific data are available to quantify this water quality problem in the Watts Branch Watershed. It is recommended that the County revise the existing water quality monitoring program in accordance with the recommendations of the Metropolitan Washington Council of Governments (COG) and the Montgomery County functional stormwater master plan.

Rock Run

Rock Run is a small stream having a watershed of approximately five square miles beginning near Potomac Village. Most of the watershed is wooded and undeveloped. Stream flow normally varies between one and five cubic feet per second near its confluence with the Potomac River. The majority of the streambed is rock and gravel. Relative velocity and turbulence in the stream are high due to the generally steep gradient. Rock Run has a change in elevation of 350 feet as it flows four miles from its headwaters to the Potomac River.

Geologically, the Rock Run Watershed is almost entirely underlain by albite-chlorite-muscovite-quartzschist of the Wissahickon formation. The stream contains numerous small pools and is heavily shaded with large trees over most of its length. A sanitary sewer has been constructed along Rock Run, and small sections of the stream have been channelized and diverted during highway construction.

The water quality of Rock Run has been rated as excellent, based on bi-weekly means of low biochemical oxygen demand, low nitrate-nitrite nitrogen, low average phosphate, low total coliform densities, and low fecal coliform densities. Rock Run supports a diversity of fish species, and contains several species considered intolerant of pollution. The stream valley extends three airline miles from MacArthur Boulevard at the Navy Truck Road northwestward to Falls Road and Potomac Village. Below MacArthur Boulevard, the stream flows 0.4 miles into the Potomac River through a floodplain that is under the control of the National Park Service and the Department of the Navy. The width of Rock Run Watershed extends in a northeast to southwest direction from Persimmon Tree Road to the ridge above MacArthur Boulevard and Brickyard Road.

This watershed is unique in Montgomery County in that about half of its area remains non-urbanized and is largely covered by second-growth woodland. The uplands on the north side are mainly cultivated fields and pastures. The chief urbanized area is in the northwest portion, in the segment bounded by Oaklyn Drive and Logan Drive. This watershed was associated with goldmining activity from the post-Civil War era to about 1905. Many mine sites, prospecting pits, and mine entries still exist in the area east and southeast of River Falls Elementary School on Brickyard Road. Less than two acres, out of a total of more than 3,200 acres, of this watershed are currently in parkland.

Rock Run meanders upstream for three miles to its juncture with the east branch, then another two miles to the vicinity of its source near River Road, west of Potomac Village. The first three miles are characterized by a rather narrow floodplain, typically up to 200 feet wide at several points. The steep wooded slopes come down almost to the water's edge, leaving a narrow gorge between. The area where the sewer line was installed occupies most of the "floodplain."

A slope of 25 percent (25 feet of elevation for every 100 feet horizontal) is typical of the lower three miles of this stream valley, including the lower reaches of the stream's minor tributaries. Above the east branch juncture the slope is more gradual and slightly rolling. The stream valley is largely urbanized from the vicinity of Oaklyn Drive to the stream's source. Conservation areas, 100 feet on either side of the stream, currently exist in the vicinity of Potomac Village. The slopes and some uplands are covered with young, second-growth hardwoods, often interspersed with Virginia pine. The latter form pure or mixed stands on only a few slopes or upland pockets. Older, mature hardwoods occur only along the main stream or in the lower reaches of tributaries. Many of the mature hardwoods were recently logged out from the middle reaches of the stream valley, but the slash was left making some areas virtually impenetrable.

Rock Run is an attractive stream, with exposed rocks and frequent cataracts along much of its lower course. The only despoilment is the open swath resulting from the construction of a sewer line some years ago. The line of the sewer is now a hiking and horse trail, which crosses the stream about a dozen times. Tall grasses, herbaceous plants, and saplings have grown up here to obliterate most of the scars.

The Potomac Bridle Trails Association has developed a network of trails in the Rock Run Watershed and maintains them so that they are safe for walking and riding. The association published a trail map (1975) of the riding and walking paths in the Rock Run Watershed and in other areas comprising the "Potomac Loop." These are shown on the fold out Zoning and Transportation Plan Map 27 contained in this report. Some follow the stream and others follow the ridges parallel to the stream valley. Several connecting trails cross the stream and connect with stables where horses are boarded. The largest stable is on Avenal Farm off Persimmon Tree Road. Trails are all open and free of undergrowth. Poor drainage, a problem in a few places, can easily be remedied.

Seneca Creek and Muddy Branch

The Seneca and Muddy Branch Basins encompass 158 square miles, or 30 percent of the entire County. Approximately four-fifths of the Darnestown Planning Area and approximately one-fourth of the Travilah Planning Area are included. In 1975, 83 percent of these basins remained undeveloped or in agricultural use. Due to the development of Gaithersburg, urbanization is more evident in the Muddy Branch Basin (27 percent) than in the Seneca (15 percent). The Seneca Basin will experience a substantial increase in urbanization; it contains all of the Germantown and Clarksburg corridor cities, and a major portion of Gaithersburg.

Virtually the entire headwaters area of Muddy Branch, and large portions of the Long Draught, Whetstone, and Cabin branches of Seneca Creek, are heavily urbanized. Recent moratoria on sewer hook-ups have slowed the pace of new development but considerable activity is still occurring in the North Gaithersburg area and also in the Germantown vicinity, where previously authorized sewer connections are being developed.

Existing land uses have produced only a limited number of significant watershed management problems. Criteria used to identify problem areas included the 100-year floodplain, the hydraulic capacity of stream crossings and roadways, and stream channel erosion. Six types of problem areas merit attention:

- (1) developed areas;
- (2) roads and bridges;
- (3) railroads;

- (4) historical and archeological sites;
- (5) environmentally sensitive areas;
- (6) stream channel erosion.

In the Muddy Branch Watershed, problems include developed areas, roads and bridges, and stream channel erosion. Stormwater problems include flooding at Quince Orchard Road, American Way, Route 28, and Muddy Branch Road, and also potential stream valley erosion.

In the Seneca Basin, stormwater problems associated with developed areas have been found along Seneca Creek and Great Seneca Creek within the Subregion plus other tributaries outside the Subregion: Long Draught Branch, Whetstone Run and Gunners Branch. Problems associated with roads and bridges have been found for all streams. Problems associated with historical and archeological sites were identified on Seneca Creek and Great Seneca Creek within the Subregion and other tributaries outside the Subregion: Little Seneca Creek, Dry Seneca Creek, Long Draught Branch and Goshen Branch. Environmentally sensitive areas were identified on Seneca Creek, Great Seneca Creek, and Little Seneca Creek. Problems associated with potential stream channel erosion derived from changes in the intensity of land use have been identified for Great Seneca Creek plus the following streams outside the Subregion: Little Seneca Creek, Long Draught Branch, Whetstone Run, Magruder Branch and Gunners Branch.

Physical Environment. The western portion of the study area within the Seneca Creek watershed is underlain by phyllite. Along Seneca Creek and further to the west, the phyllite is overlain by sedimentary rocks of Triassic age. Much of the Seneca Basin exhibits excessively drained surface materials, thin
overburden, and surface water.

Flora and Fishes. Little Seneca Creek (northwest of the Subregion) is a designated trout stream and is stocked with trout by the Maryland Fisheries Administration, and has a high number of other fish species.

Seneca and Muddy Branch contain a diversity of fish species. These waters, exclusive of the Potomac River, constitute the southernmost distribution in Maryland for the Greenside Darter, and the westernmost distribution for the Mudminnow. In general, these streams contain a large diversity of fish species, especially along their lower reaches. They contain some fish which have been listed as rare or depleted in Maryland in the paper, <u>Threatened Freshwater Fishes of</u> the United States.

One of Montgomery County's most unique plant associations occurs along Seneca Creek near Berryville Road, in a place known by local people as "the Horsehole." Two large stands of native hemlocks can be found on these cool, shady slopes. Some of the trees have probably never been logged, and this is probably the only stand of virgin timber remaining in Montgomery County.

<u>Water Quality</u>. Most of the streams within the Seneca Creek and Muddy Branch Watersheds are designated as Class I Waters - Water Contact Recreation and Aquatic Life. Little Seneca Creek and its tributaries are designated as Class IV Waters- Recreational Trout Waters.

Wetlands. Wetlands in the Seneca, Muddy Branch, and Watts Branch Watersheds consist of seasonally flooded basins, inland fresh spring meadows, inland open fresh water, and shallow fresh marshes. There are no natural lakes in these watersheds; however, over 125 ponds have been constructed.

The major wetland areas in these watersheds are the flood plains of the streams themselves. The streambanks constitute over 75 miles of shoreline. In addition, yearly floods which overtop the streambanks saturate the soil for several hundred feet on each side of the streams.

If a value of 100 feet on each side of the stream is chosen as the average width of the floodplain, then the floodplains along the 75 miles of streams would constitute over 1,800 acres of type 1 wetland resources (seasonally flooded basins or flats). Representative vegetation in these areas includes sycamore, ash and willow trees; spicebush, jack-in-the-pulpit, and skunk cabbage are also common, as well as a diversity of bottom-land hardwoods. The floodplains are home to a variety of animals, including wood ducks, muskrats, raccoons, opposums, minks, weasels, beavers, and kingfishers.

<u>Ponds.</u> Ponds constitute over 200 acres of wetland in the Seneca, Muddy Branch, and Watts Branch Watersheds. Seneca Creek Watershed has at least 51 ponds. Of these, 40 are under one acre in size. Eight are more than one acre, but less than four acres. Only three ponds are over four acres in surface size. Thirtyfour ponds dot the Muddy Branch Watershed; 26 are less than one acre in surface size. Six ponds are larger than one acre, but smaller than four acres. Only two ponds are larger than four acres. Watts Branch has at least 40 ponds. Thirty-six are smaller than one acre, four are between one and four acres, and none are larger than four acres.

Water in these ponds is usually less than ten feet

deep, and is fringed by a border of emergent vegetation. This may include cattails, pondweeds, wild rice, arrow heads, pickerelweeds, and some of the aquatic grasses. Some of these ponds (depending on ownership,) provide recreational fishing opportunities.

Environmentally Sensitive Areas

The following brief synopsis of environmentally sensitive areas, keyed to the environmental features map, represents a small fraction of the diverse and valuable natural resources found in these watersheds. The conservation and preservation of these resources will depend upon careful land use and zoning policies. While it must be realized that all natural areas can not be preserved, skillful planning can maximize the best management of these resources.

Map

Key Rock Run Watershed

El Rock Run, a small stream traversing a predominantly wooded and undeveloped watershed, has shown little change in its fish population over the last sixty years. Throughout this recorded period, Rock Run has maintained an excellent species diversity with twenty-one species collected in a 1974 survey. Several of these species are generally regarded as being pollution intolerant.

Watts Branch Watershed

E2 Comprised of about ten acres, this unique floodplain area supports a variety of flora and fauna. Bird-banding activities have been conducted at this location for several years, with some rare species being banded. Located within the immediate vicinity is the M-NCPPC "Adventure" Nature Study Center.

E3 This botanically-rich area, situated in the headwaters of Greenbrier Branch, contains the only observed Montgomery County Location of Culver's Root (Veronicastrum virginicum), Featherbells (Stenanthium gramimeum), Blue-eyed grass (Sisyrinchium mucronatum), and Golden Alexander (Zizia aptera). Additional species such as the Black Jack Oak (Quercus marilandica), Downy False Foxglove (Gerardia virginica), Wild Indigo (Baptista tinctoria), Turk's Caplilly (Lilium superbum), and Ninebark (physocarpus opulifolius), which are very rare in other parts of the County, are found here in abundance.

E4 This Greenbrier Branch floodplain area is the last recorded locality in Montgomery County where Golden Club (Orontium aquaticum), an emergent plant, is found in relative abundance.

E5 Sandy Branch, a small western tributary of Watts Branch, exhibits a high diversity of fish species. This is reflective of the excellent biological condition of the stream which is due primarily to the extensive stands of mature hardwoods that cloak this predominantly rural sub-basin.

Muddy Branch Watershed

E6 This valuable wetland area is the site of the Maryland Department of Natural Resources Dierrson Waterfowl Sanctuary. In addition to waterfowl, this location contains one of the largest stands of mature trees in the Subregion.

Seneca Creek Watershed

E7 Two hemlock stands on northward facing slopes are part of the most unusal plant association to be found in Montgomery County. Hemlocks are common in the cooler mountainous areas to the north of Maryland, but are rare in the Piedmont section of Maryland.

Stormwater Runoff

The greater Washington region is one of the few metropolitan areas with stream valley parks. These parks cover thousands of acres and are used by hundreds of thousands of people for various recreational activities. The stream valleys in the Potomac Subregion provide drainage for over 50 square miles of adjacent urbanized areas. The effects of erosion, pollution, and sedimentation are visible everywhere along the area's streams and their major tributaries.

After a heavy rain, dozens of storm sewers that empty the runoff into local creeks carry a heavy load of topsoil and rubbish, estimated to be 100,000 tons per square mile per year. This problem has grown with increased urbanization in the County. In addition, the runoff from saturated grassland and cultivated land flows into the creeks.

Urbanization usually has an adverse effect in terms of water quantity. When a tract of land is developed, springs are often covered up, a storm sewer may replace the former stream and the amount of water reaching streams changes markedly, with heavy runoffs following storms but dwindling to smaller than normal flows during dry spells. Vegetation is adversely affected by the flooding and the temporary drying of tributaries, the deposition of silt and bank erosion. Many delicate species of wildflowers have disappeared from their natural habitat in the floodplain.

Runoff and sedimentation from cultivated fields cannot be overlooked. Instances of severe runoff and soil erosion have been noted in grain fields on sloping land in the Rock Run Watershed. Another contributing factor in the erosion and sedimentation of the stream valleys is the growing use of motorbikes or minibikes. Evidence of such illegal use was noted in several different areas.

Although relatively little can be done in the immediate future about the problems of erosion, pollution, and sedimentation that have resulted from existing urbanization, steps can be taken to prevent a worsening of the situation by programs recommended in the County's Adopted Functional Master Plan for the Seneca Creek and Muddy Branch Basins, and the Draft Functional Master Plan for the Rock Creek Basin. A similar plan will be completed in the summer of 1980 for the Cabin John and Rock Run Basins. The essential approach of the watershed plans is a combined public/private effort.

These functional master plans emphasize preventative measures such as land use planning, stream valley acquisition, agricultural conservation practices and best management techniques to prevent non-point source pollution, as compared to the protective measures such as channelization and construction of dams.

Public Law 92-500 requires fishable and swimmable streams. Although little data is available on

the streams within the planning area, current County policies along with those proposed in the draft Rock Creek Plan will go a long way toward meeting the goals outlined in P.L. 92-500.

The forthcoming Functional Master Plans for Cabin John, Little Falls and Rock Run will include sitespecific recommendations for the protection and improvement of those streams.

GROUNDWATER

Water of suitable quality for domestic and public supply is available in limited quantities from the various subsurface rock units in the Potomac Subregion.

There are three major geologic units producing water within the Subregion. A narrow area between Seneca Creek and a parallel line from Darnestown south southwest to the Potomac River is underlain by phyllite of the Ijamsville formation. Yields from wells drilled in phyllite are among the smallest in the area, with slightly more than 50 percent producing less than 6 gallons per minute (gpm), and about 45 percent yielding 6 to 25 gpm. The remaining 4 to 5 percent yield over 25 gpm.

Most of the Potomac Subregion is underlain by the upper Wissahickon Schist. This formation is a major source of groundwater for domestic use in the County and, except for gneiss and granitic rocks, has the best yield. About 52 percent of the wells in this formation yield 6 to 25 gpm, and 23 percent yield more than 25 gpm. Average porosity and permeability data show an 8 percent gravity yield from the upper Wissahickon formation; this equals 26,000 gallons per acre foot. USGS data show the mean yield to be 11 gpm. The third rock unit in the County that yields water (from a small number of wells) includes mafic and ultramafic rocks. There is serpentinite within this unit. The yield from such rocks is mostly in the intermediate range: 6 to 25 gpm for 65 percent of the wells, and less than 6 gpm in 30 percent of the wells. The largest area of serpentinite is in the vicinity of Hunting Hills. Other areas of mafic and ultramafic rocks occur in elongated narrow bands trending northeast-southwest.

In general, depth to the water table is least in the stream valleys, being less than 10 feet over about onethird of the area and between 10 to 35 feet deep in most of the remaining area. On ridges and in several large patches (where depressions in the bedrock contain a thick overburden of saprolite) the depth to the water table is over 35 feet. In areas where depth to the water table is moderate to deep (20 to 25 feet or more) and water supplied by wells is adequate for individual lots, development on 2 to 5 acre lots should pose no problems as long as wells and septic tanks are properly installed.

WATER AND SANITARY SEWER SYSTEMS

With the exception of the Cabin John Watershed, the immediate vicinity of Potomac Village and several other small areas, the Potomac Subregion is outside the 10-year water and sewer "envelopes." Trunk sewers are located in each of the major stream valleys. The trunk sewers discharge to the large interceptor sewer which parallels the Potomac river. The interceptor flows by gravity to the Blue Plains Treatment Plant located in the south part of the District of Columbia.

The four categories of existing approved sewer service areas are designed to stage sewer service in conformance with the policies in the approved comprehensive Ten-Year Water Supply and Sewage Systems Plan which is adopted and updated annually by the Montgomery County Council and approved by the Maryland Department of Health and Mental Hygiene.

Treatment Systems

Since the capacity at the Blue Plains plant is limited, the County Government, after much deliberation, has selected a site in the Rock Run Basin for the construction of a new 20 mgd advanced wastewater treatment facility. This facility will withdraw sewage from the Dulles Interceptor, which would normally go to the Blue Plains facility, treat the sewage onsite, and then discharge the treated effluent through a transmission line below the normal water supply intakes on the Potomac River. By reducing the flow to the Blue Plains facility an equivalent amount of sewage flow can be added elsewhere in Montgomery County in the Blue Plains service area. The site for the Rock Run facility will be a portion of the parcel known as the Avenel Farm.

Conveyence Systems

The Potomac Interceptor is the major sanitary sewer serving Rock Run, Watts Branch, the combined flows in the Muddy Branch, and other limited flows generated in the Potomac Basin. This interceptor has a total length of some 42 miles, an inside diameter ranging from 3'6" to 7', and an actual design peak capacity of 150.62 mgd. The interceptor also serves the Cabin John Basin and extends from the mouth of Cabin John Creek in Maryland to the Blue Plains Treatment Plant. Whereas the interceptor also accepts flows from Virginia and the District of Columbia, the treatment capacity in this sewer allocated for use by Montgomery County is 9.6 mgd average flow. Sewer authorizations in this Subregion are consistent with the Blue Plains Sewage Treatment Plant Agreement of June, 1974 and the current Interim Sewer Service Policy approved by the Montgomery County Government. Except for the Cabin John Basin, all of the trunk sewers in tributary basins within the Subregion are adequate for current and anticipated future use.

<u>Cabin John Basin</u>. The portion of the Subregion in the Cabin John Drainage Basin are all within sewer service Category S-1, which means that all of the area can be served by sewers. Service is provided by a system of sewers which reach up into the headwaters of the basin along the mainstem of Cabin John Creek and branch off to service many areas in the basin.

Existing transmission inadequacies are due, in part, to the limited capacity in the trunk sewer between George Washington Parkway and Booze Creek. Additional pumped flows from the Rock Creek basin in the City of Rockville aggravate this situation by increasing the hydraulic loading in this basin. In order to correct this problem, the WSSC has scheduled the construction of a relief sewer. This sewer will be placed along Cabin John Creek from Booze Creek to Branch D, and will consist of 2,000 feet of 27 inch diameter and 25,200 feet of 24 inch diameter pipe with a capacity of 30.9 mgd. Construction of this project was scheduled to begin in FY 1979. There are no existing treatment facilities in this area of the Subregion.

Rock Run Basin. The existing sewer system consists of a trunk sewer and feeder lines extending up the mainstem of Rock Run. Sewage flows by gravity down the basin to the Dulles Interceptor and on to the Blue Plains Plant. There are no planned or existing sewer projects or system modifications in this basin. The existing sewers are designed and sized for full development flows. The Rock Run trunk sewer following the stream valley ranges in size from 15 to 21 inches in diameter and has a peak capacity of 6.4 mgd where it connects with the Potomac Interceptor.

Watts Branch Basin. A trunk sewer extends up the mainstem of Watts Branch. Flows from the Watts Branch Basin discharge to the Potomac Interceptor via a 15 to 36 inch diameter sewer which has a 15 mgd capacity at the point of connection. There are no additional transmission facilities needed or proposed for this basin.

Muddy Branch Basin. A trunk sewer extends along the mainstem of Muddy Branch. In addition to the natural gravity sewage flows in this basin, the Muddy Branch trunk sewer also conveys flows which are pumped over from the Seneca Basin.

The design capacity of the Muddy Branch sewer system (21 mgd) would be adequate to serve projected Muddy Branch development. However, because the Muddy Branch Interceptor also handles some of the Seneca flows, the WSSC has constructed a relief sewer with a capacity of 26 mgd to accommodate projected combined flows. It was placed along Muddy Branch and consists of approximately 5,450 feet of 27 inch diameter and 12,150 feet of 24 inch diameter sewer pipe.

Seneca Basin. Currently all flows in this basin are pumped into contiguous basins that are tributary to Blue Plains. Those portions of the Seneca Basin which are within the Subregion are located at the lower reaches of the Basin. These areas do not require and therefore are not programmed for additional sewer service within the next ten years.

Potomac Basin. The only public sewer service in this basin is provided in selected areas southwest of Rock Run. Sewage flows directly to Blue Plains via the Potomac Interceptor.

Water Projects

Two proposed major projects in the planning area are:

- (i) (ii)
- the cross county water line; and expansion of WSSC water treatment plant

These projects have County-wide significance as compared to local planning issues. Water supply and distribution has been for the County and region the subject of many studies ranging from the Corps of Engineers comprehensive study to the Bi-County Water Supply Task Force. Although these projects have been accepted for planning purposes, their actual construction is dependent upon other County-wide projects such as construction of Lake Site #3 (Germantown Lake) and Project 80 (water line to Silver Spring and Prince George's County).

Lake Site #3, a water storage facility, was identified as the most cost effective means of augmenting water supply resources for emergencies. Both expansion of the treatment plant and Project 80 would provide greater system reliability. Project 80 is a programmed water supply main which services lower Montgomery County and Prince George's County.

ENVIRONMENTAL IMPACTS OF PLAN PROPOSALS

Transportation

Concerns associated with road improvements

involve impacts on streams, natural features, and noise levels. In general, careful study of the environmental impacts of road proposals should be made, particularly for new roadways and for road widenings to four lanes or more. Road designs should avoid traversing woodlands, floodplains, steep slopes, or paralleling streams. Provision of noise abatement barriers should be provided where feasible.

Democracy Boulevard has been approved as a two lane extension from Gainsborough Road to Kentsdale Drive. The right-of-way will parallel a tributary of Cabin John Creek. Road construction in this area will result in loss of woodlands and construction on severely limited soils. Potential impacts include increased erosion, storm flow, and stream pollution, as well as loss of aquatic species and wildlife habitat. To reduce these impacts, the most southerly alignment, which is more removed from the stream, is recommended. Any future four-lane construction from Falls Road should include careful evaluation of how existing berms could be replaced to minimize road noise impacts on adjacent residential property.

Montrose Road is recommended as a two-lane (non-freeway) extension to Falls Road although noise levels for existing residents will increase. The wide right-of-way has ample space to accommodate noise barriers, which should be provided where feasible.

Oaklyn Drive is shown as a new collector road, located in the Rock Run drainage basin. There is the potential for increased storm flow and erosions in this area. The final alignment should be well north of Rock Run, to avoid steep slopes and the headwaters of several small tributaries.

Land Use

Residential. There are a variety of environmental concerns associated with proposed residential zoning (R-200 to RURAL) for undeveloped portions of the Potomac Subregion. They are summarized as follows: Development on severely limited soils, including thin soils overlying the serpentinite mass, (see Maps) could increase erosion and septic field problems. Headwaters development in Muddy, Watts, and Rock Run could lead to increased storm flows, stream pollution, and loss of aquatic species. Large areas are identified as prime agricultural lands to be protected in the M-NCPPC Critical Areas report to the State of Maryland. A conservation area is identified for protection for areas one mile inland along the Potomac River, by the Critical Areas report. This area contains severely limited soils, steep slopes, and certain environmentally sensitive areas. Major noise sources are associated with the Travilah Quarry and the National Airport flight path.

Proposed Rural and Rural Cluster zoning will minimize development on some prime agricultural lands and on severely limited soils in the Seneca Creek basin and a portion of the Muddy Branch basin south of Esworthy Road.

RE-2C zoning is proposed for several large tracts south of River Road to the Potomac River and south of Persimmon Tree Road to I-495. The clustering of lots within a development will allow areas with more severe slopes to be left undeveloped. South of Potomac Village, the lowest density possible is needed to minimize the number of residents exposed to noise from National Airport. RE-2 zoning is to be retained for the area south of the Travilah Quarry to Glen Road. This area includes much of the shallow serpentinite bedrock which severely limits well water availability and septic field use. Continuation of RE-2 zoning may lead to lower residential densities (lot sizes of up to 10 acres) due to septic requirements. Such low densities would result in less stormwater flow and would better protect sensitive plant and aquatic species along Greenbrier Branch.

<u>Commercial/Industrial</u>. The plan identifies several sites as suitable for neighborhood commercial use. These sites were reviewed in terms of streams, stormwater control, soil types, steep terrain, and noise impact.

The site at Route 28 and Seneca Road was found environmentally acceptable.

I-3 industrial park zoning is recommended for a site north of Montrose Road and west of I-270. High road noise levels from I-270 make this site undesirable for residential development. East of I-270 and north of the GEICO property lies another site which is similarly appropriate for non-residential use.

Potomac Village. Existing R-200 zoning has been reaffirmed on approximately 12 acres surrounding the

commercial uses in the Village. Language identifying certain parcels as "suitable for special exception" has been removed.

The Village is located in the headwaters of the Rock Run basin. It is expected that increased density and land coverage would result in downstream changes such as channel enlargement, bank erosion, and loss of aquatic species.

The Plan recommends that the conservation area along Rock Run (originally to be 200 feet wide) be maintained and strengthened. The purpose of the conservation area is to provide a natural buffer of "unconnected imperviousness" between developed property and the stream, and to prevent land clearance in floodplains and on steep slopes with erodible soils (generally exceeding a 25 percent slope). The conservation area is to be a minimum width of 200 feet (100 feet from the stream centerline), and is to include all officially delineated 100 year floodplains. A building restriction line of 25 feet beyond the conservation area boundary will be applied. Proposed stream valley park property in the lower half of the basin will provide substantial protection to the immediate stream environs, floodplains, and steep slopes along Rock Run.

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TRANSPORTATION

SUMMARY

The following are considered to be the major transportation proposals of the master plan. The limited number of roadway improvements will not provide a generally-accepted level of traffic service. However, in the interest of preserving the semi-rural character of the Subregion, the Plan determined to retain a two-lane cross-section for most roads, even though congestion will occur.

- 1. Seven Locks Road Improvements
- 2. Montrose Road extension
- 3. Democracy Boulevard extension
- 4. Realignment of Falls Road
- 5. Maryland Route 28 widening
- 6. Public Transit Services
- 7. Bicycle and Pedestrian Facilities

BASIC CONSIDERATIONS

Transportation Analysis

The transportation analysis contained in this Plan is based, at least in part, on the analysis done for the Fifth Growth Policy Report. The Potomac Subregion, called the Potomac Policy Area in the Growth Policy analysis, consists of the Potomac Traffic Shed and Travilah/Darnestown Traffic Shed. These traffic sheds have boundaries which correspond with the Planning Areas of the same names (with the exception of the R-200 zoned area along Route 28 which is assigned to the Gaithersburg Traffic Shed). In the Potomac Traffic Shed, analysis indicates a Stage I limit of 1,800 additional dwelling units with no changes to the existing roadway network. Stage II could begin when the extensions of Democracy Boulevard and Montrose Road are at least 50 percent programmed for construction. Montrose Road is recommended to be constructed as a two-lane roadway from its existing terminus at Seven Locks Road west to Falls Road along the right-of-way acquired for the Rockville Facility. Democracy Boulevard is recommended to be extended to the west to intersect Kentsdale Drive in the vicinity of the Sisters of Mercy Generalate. Democracy Boulevard is also recommended to be a two-lane roadway.

At this time, it is the proposed policy of the Montgomery County Planning Board to maintain the remaining roadways in the Potomac-Cabin John Planning Area in their current two-lane configuration. The Planning Board feels that to expand existing roads to cross-sections in excess of two-lanes except where absolutely necessary would be a substantial change to the character of the area. Since the Potomac Subregion is in effect a "cul-de-sac" with little through traffic, the Board believes that a reasonable policy is to maintain two-lane roads with only Route 28 and the section of Seven Locks Road between Tuckerman Lane and the City of Rockville boundary recommended to be widened to four-lanes. The Planning Board recognizes that this will produce levels of traffic congestion during peak periods greater than have been traditionally considered to be acceptable in other areas of the County but feels that this is a legitimate trade-off in order to maintain the character of the area. This is especially true in view of the fact that only traffic generated within the Subregion will be affected. Therefore, after the proposed Democracy Boulevard and Montrose Road extensions are at least 50 percent programmed for construction, the remaining vacant land in the planning area can develop to the extent allowed by proposed zoning. This would produce approximately 5,800 additional dwelling units. As is noted, this amount of development will result in traffic congestion in excess of the ten percent Level of Service (LOS) E threshold standards for this policy area.

In the Travilah/Darnestown Traffic Shed, the recommend Stage I limit is 2,000 additional dwelling units. Construction of the following projects will accommodate the approximately 5,000 additional dwelling units forecasted to occur in Stage II, with some excess capacity in reserve which will be needed to reach the zoning capacity of 11,400 additional dwelling units:

- Relocate Maryland Route 28 from Research Boulevard to Muddy Branch Road. This is to be a four-lane highway.
- 2. Widen Route 28 from Muddy Branch Road to Riffle Ford Road to a four-lane roadway.

Highways and Roads

The previously adopted area master plans recommend a functionally classified system of roadways which implies a hierarchy of traffic volume distribution. The framework of this system is the existing State roads, such as Falls Road and River Road, and some County roads which are classified on the earlier plans as major highways. This is supplemented with a network of arterial, primary, and secondary streets. The transportation plan proposed in this new master plan is significantly different. For the duration of the 20-year planning analysis period, the hierarchy concept will essentially be replaced by the concept of a uniform system of two-lane highways, with minor exceptions.

Major highways normally carry the largest volumes of area traffic and are the facilities which provide the continuity necessary for area-wide mobility. On contrast, local subdivision streets normally provide access to individual properties in the areas which they serve. In between the extremes of major highway and local street, there are several classifications of roadways which provide varying degrees of continuity for mobility and land service functions. In this proposed plan, with its essentially uniform system of two-lane facilities, starting with major highways and extending down through residential secondary streets, traffic will seek the least congested path. In some cases, this may mean that two-lane primary residential streets may be subjected to traffic volumes normally associated with major highways.

Normally, traffic flows to multi-lane major roadways because they have the capacity to allow traffic to move expeditiously and result in less travel time for the motorists. With the constraints upon improvement of major roads it is expected that more traffic will seek to utilize the local street system to a greater extent. Traffic will tend to use major highways only if the arterial, primary and secondary streets are made highly inconvenient to use by the imposition of traffic controls. This will become a difficult system to manage when, eventually, traffic volumes on the two-lane major highways exceed their traffic-carrying capacities. Traffic, like water, tries to seek its own level by diverting to arterials, primaries and secondaries.



POTOMAC-CABIN JOHN AND VICINITY P.A. 29

AVERAGE DAILY TRAFFIC



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TRAVILAH AND VICINITY P.A. 25

AVERAGE DAILY TRAFFIC



····· Planning Area Boundary

The Planning Area is bounded on the east by I-270 and I-495, and is penetrated slightly by the Cabin John Parkway to the south; both are limited access highways and offer excellent regional access to the metropolitan area. However, I-270/I-495 effectively acts as a barrier between the Subregion and the remainder of the County. All traffic to the District of Columbia, and mid and lower County, Virginia, and Prince George's County must cross or enter I-270/I-495 at the limited number of interchanges or crossings. The Potomac River, a barrier and boundary on the southwest, has no crossing in the Planning Area. Route 28 and the rural up-County areas form the northern Subregion boundary.

The internal layout or pattern of the road system has developed along the same paths established during or even before Potomac's early settlement by Europeans. Of all the roads, only River Road penetrates the entire Subregion as a continuous highway, traversing Potomac from the southeast to the northwest. The existing internal layout of roadways in Potomac often necessitates inefficient circuitous travel that encourages short-cutting and spillover of arterial traffic on local streets.

Virtually all major roads are constructed as "open section" (no curb and gutter), two-lane roadways without sidewalks. Local subdivision streets, not otherwise classified on the master plan, are often built to better standards than the major roads they feed. This is due to their more recent construction. Major roads with traffic volumes which warrant expansion have not, for the most part, been improved or expanded to current standards or master plan dimensions due to right-of-way restrictions, limitations on available funds, and negative community reaction to highway improvement projects.

Traffic Volumes

Existing traffic volumes as shown on Maps 10 and 11, vary dramatically in the Subregion, reflecting the difference in land use and density which varies from Darnestown's rural setting to the eastern area's developed subdivisions and shopping complexes. Development and life style throughout the Planning Area are clearly dependent upon private mobility via the automobile.

From a travel pattern perspective, the Potomac Subregion is a self-contained unit. The amount of through-traffic penetrating the Subregion is insignificant. Highway conditions and levels of congestion will only impact people living and working within the Subregion but will not affect significant amounts of traffic passing through the Subregion. However, the Subregion "exports" significant through-traffic to outside areas, especially Bethesda. Within the Subregion, travel volumes result from area residents going to and from school, shopping and recreation within the area, and shopping and employment outside the area.

Major highways and arterials in the Potomac Planning Area (PA 29) average from 15,000 to 20,000 vehicles per day. There are exceptions. Roadways in the Travilah/Darnestown Planning Areas (PA 24 and PA 25), with the exception of Route 28, all carry less than 2,500 vehicles per day. Since the physical characteristics of all the roadways in the Subregion are quite similar (two-lane roads), the distribution of traffic volume is basically a function of shortest time-path and best intersection conditions.

The highest volumes in the Subregion, which range from 15,000 to 30,000 vehicles per day, are recorded on

the few roadways crossing I-270. These roadways (Route 28, Falls Road at Seven Locks Road, Montrose Road, Tuckerman Lane, Democracy Boulevard, and River Road), act as ends of funnels, channeling traffic south and east. Most traffic entering and leaving the Subregion must cross I-270 or I-495, and a substantial component of that traffic must travel on interior north/south arterials to intercept one of the east/west crossings of these freeways. This excaberates congestion on north/south roads, particularly Falls Road and Seven Locks Road.

Analysis indicates the intersection levels-ofservice (LOS) and roadway link volumes reflect the existing problems on the Falls Road and Seven Locks Road links to the City of Rockville and I-270 at Montrose Road. Congestion also occurs on Route 28 between Quince Orchard Road and Rockville. Traffic on both River Road and Seven Locks Road is, with some exceptions, within acceptable limits of congestion, with intersections operating satisfactorily at most times.

Most intersections in the Subregion are controlled either by stop signs or else the Maryland right-of-way rule applies. Only eleven intersections in the entire Subregion are traffic actuated, signal controlled. Speed limits are posted on many of the roads.

Public Transportation

Public transportation in the Subregion is provided by the Washington Metropolitan Area Transit Authority (WMATA) which operates the regional Metrobus system. Service consists of scheduled Metrobus service which operates on four basic fixed routes connecting Potomac to Silver Spring, Rockville, Friendship Heights and Washington, D.C. via Falls, River, Seven Locks, and Montrose Roads and Bradley and Democracy Boulevards. Patronage is primarily in the peak commuter hours when about 300 persons ride the buses from Potomac in the A.M. peak hour and a similar number returns to Potomac by bus in the P.M. peak hour. The most popular transit service is the Montgomery Mall peak hour express service; about a third of the patrons using this service are Potomac residents.

Transit service is routinely expanded by adding additional buses or trips on existing routes or establishing new routes within WMATA's regional service area. Adjustments which increase service are usually made in response to ridership increases, such as has occurred with the Montgomery Mall express service. It is apparent that the park-'n'-ride/express service operation is attractive to area residents. It is expected that transit capacity will continue to be incrementally increased in the short term, particularly Montgomery Mall express service and on the River Road routes.

The only major change anticipated in the Subregion's public transportation service will occur in conjunction with the opening of Metrorail service. The Metrobus service network will be restructured to serve Metrorail stations for bus/rail transfer. When Metrorail service opens on the Rockville Line new and expanded bus service will make transit a more attractive, viable alternative to auto travel for Potomac residents. The Planning Board, along with WMATA and the County Department of Transportation, will be planning the new services to make the most effective use of limited transit equipment and operating subsidies. The amount of service in the area will depend upon County policy decisions on acceptable levels of operating subsidies.

Non-Motorized Transportation

For some limited numbers of people, walking and bicycling provide alternatives to travel by auto and public transit. In Potomac, distances between origin and destination points are generally too long for walking, except for pleasure or health. Bicycling is somewhat more feasible especially for local shopping, service, or social trips. Although it is not logical to consider walking and cycling as alternative modes for the typical long-distance work commutes of Potomac residents, they can meet recreational and social needs of the residents of the Subregion. These forms of transportation are probably most important to the younger residents of the area who have not yet reached driving age or who do not have easy access to an automobile.

Bikeways

There is no completely interconnected bikeway or pedestrian system within the Subregion at present. There are, however, several links in an ultimate bikeway system such as the bikeways along MacArthur Boulevard, River Road and the C & O Canal tow path. Both the MacArthur Boulevard and the River Road bike paths are underutilized at present, partly due to substandard design and construction, and lack of maintenance but also because of the lack of continuity and connection into subdivisions and to specific destination points. One other existing facility which is partly within the Subregion is the Seneca and Sandstone Tour Trail which was mapped out along the western boundary of the Darnestown Planning Area by the Sugarloaf Trails Association.

Many of the more recently built subdivision streets and a number of the County roads which have been brought up to standard provide excellent cycling opportunities, particularly on roads where traffic volumes are light. However, many of the older County and State roads are too narrow, lack shoulders or have very short sight distances, making them hazardous for all but the most accomplished of cyclists. In order to arrange for an ultimate network of interconnected bike routes (on conventional roads), bike lanes (on the roadway, but limited to bicycle) and bike paths (separated from the roadway and restricted to cyclists or pedestrians), the Planning Board and Commission did prepare the Master Plan of Bikeways, which was adopted in June 1978 after public hearings and approval by the County Council. The Potomac Subregion Master Plan, therefore, incorporates those elements of the Master Plan of Bikeways which are located in the Subregion.

Esquestrian Trails. Potomac has traditionally been esquestrian country. Informal trail segments extend throughout most of the Subregion and receive regular use. The community has voiced concern that a bridle trail system be planned as a component of the area's physical development.

Most trail riding in the Subregion takes place on private property and along utility rights-of-way. No continuous, planned system of County bridle paths exists at the present time except for limited areas in certain parks (Rock Creek and Wheaton Parks). An informal system of bridle trails has been mapped by the Potomac Bridle Trails Association. The trails are not publicly protected or maintained and are, therefore, subject to severance or encroachment on various elements of the system as suburban development spreads.

Travel Characteristics

Travel characteristics of Potomac residents are typical of suburbanites elsewhere. Auto use is predominant with frequent auto trips generated for long, time consuming trips to dispersed destinations. These characteristics are slightly more pronounced in Potomac as compared with the rest of the County. Travel characteristics, taken from the 1974 Census Update for the Potomac and Travilah Planning Areas combined, and for the County at large are tabulated below. The I-270 Corridor is also included to illustrate the differences in travel characteristics of up-County residents.

TABLE XI

COMMUTING PATTERNS

	Place of Residence			
Work Location	Potomac	County- Wide	I-270 Corridor	
District of Columbia	35%	30%	15%	
Virginia	8%	5%	7%	
Prince George's County	4%	5%	4%	
Inside Beltway	22%	28%	23%	
Outside Beltway	28%	27%	52%	

One of the basic characteristics used in transportation planning analysis is the number of times a trip is made to or from the home. This is called the trip generation rate. Numerous studies indicate that singlefamily dwellings generate between 8 and 10 vehicle trips to or from the home per day, and between 0.8 to 1.14 vehicle trips per dwelling in the P.M. peak hour.

A 1976 traffic generation study, done by the Maryland State Highway Administration, included observations of a 248 dwelling unit subdivision of Potomac. The average trip rate recorded was 11.66 trips per dwelling unit per day.

Other traffic characteristics necessary to analyze traffic conditions include the percentage of daily traffic which occurs in the peak traffic periods and the directional split of peak hour traffic. Based on observations within the Subregion, it appears that standard trip generation rates apply very well. The residential trip generation rates for today's conditions are:

- 10 vehicle trips per dwelling unit per day;
- 0.9 vehicle trips per dwelling unit in the peak traffic hour;
- 60 percent of the peak hour traffic will be in the major direction, i.e., of all the traffic occurring in the P.M. peak hour, 60 percent will be inbound to the Subregion; this would be reversed in the A.M. peak hour.

An analysis of existing directional distribution of trips indicates that the orientation of trips to points outside of the Planning Area is approximately 25 percent to the north and 75 percent to the east. Trips to the west account for only a small percentage of total travel and are statistically insignificant for study purposes. These observations are consistent with the Census Survey results which found that 28 percent of the total work trips are made to destinations outside of the Capital Beltway while the remainder of the trips are made in an easterly direction, using or crossing the Beltway to points in the District of Columbia, Prince George's County, Virginia and Montgomery County inside of the Capital Beltway.

ASSUMPTIONS AND ANALYSIS

In order to project future transportation conditions, several assumptions must be made and an objective analytic methodology developed. The methodology employed for analysis of the Potomac Subregion is a standard one. Development projections were made for 10-year and 20-year periods and for the ultimate case where all land is developed. The ultimate case, representing the maximum practical amount of development which could occur with existing zoning, is used for highway classification and right-of-way protection only. Recommendations for capital improvement projects are based on 10-and 20-year projections.

The projection of the amounts of development and the population growth which will occur in the analysis period, along with assumptions regarding travel habits, are the main determinents in the modeling technique used. In the Potomac Subregion, the population and dwelling unit growth forecast is probably the most important factor affecting the transportation analysis. It is not anticipated that travel habits within the Subregion will change appreciably during the planning period because the factors which cause these habits to change are not present. The density of development in the Subregion is so low as to preclude widespread extension of any conventional form of public mass transportation which could produce an appreciable change in the mode of travel. The relative affluence of the residents of the area negates the effects that future increases in the cost of either gasoline or parking might otherwise have on the number of vehicle miles traveled. The large proportion of residents who are employed as high level professionals or business people is not conducive to increased carpooling because of the variation in working hours usually exhibited by people in these positions. Based on these assumptions of travel

behavior, a design year trip generation rate of 0.85 vehicles per hour per dwelling unit in the P.M. peak hour is assumed. This is a 6 percent reduction from the 0.90 vehicles per hour per dwelling unit rate that exists today and reflects the possibility of increases in transit use, carpooling and an overall reduction in trip generation patterns. Additional reductions in the trip generation rate could occur. However, the marginal impact on the highway network would not change the conclusions of this Subregional Master Plan.

The design year residential trip generation rate assumes future modal split characteristics as shown in the table below.

TABLE XII

PROJECTED MODAL SPLIT

Mode	Peak Hour	Daily
Percent by automobile (includes auto to Metro and carpool)	85%	93%
Percent by bus (includes bus to Metrorail and car to bus)	10%*	2%
Other Modes (includes "work-at-home" and non-motorized travel)	<u> </u>	5% 100%

Fifty percent of bus patrons from the Potomac area use "auto to bus." One other factor which usually affects an analysis of this type is a projection of the growth in throughtraffic which has an origin and/or destination outside of the Subregion. Because of the scarcity of uses usually considered to be destinations, such as large employment centers or regional shopping centers, (except at or near the Subregion boundaries) and because of the circuitous routing which must be used by someone wishing to travel through the area, it has been assumed that through traffic will not be a significant factor.

The development assumptions used in this analysis are those explained in the Population Forecast and Market Analysis sections of this Plan. While the population of the Subregion will increase and the age composition will change, this change is not significant enough to presage a change in travel characteristics. Travel orientation is assumed as follows:

Potomac Planning Area

65% to the East 30% to the North 5% to the West

Darnestown and Travilah Planning Areas

35% to the East and South 60% to the North 5% to the West

The amount of traffic assumed to be traveling in a northerly direction has been increased over existing conditions to reflect:

1. Projected increases in employment, shopping and population in the I-270 Corridor,

- The proposed interchange at Falls Road and I-270 within the City of Rockville,
- Increased employment base outside of the Capital Beltway.

Traffic generated by the projected development is assigned to specific major highways or arterial routes, based on the location of development within the Subregion and those destination areas outside the Subregion.

Traffic volumes based upon the projections for the 10 and 20 year analysis periods were compared with daily design volumes to determine the adequacy of roadway capacity. The results are shown on Maps 10 and 11. Those roadway links with volumes equalling or slightly exceeding capacity, based upon daily design volume, are classified as "marginal." Those roadways with volumes well in excess of capacity are classified as critical.

Highway Classifications and Recommendations

The highway plan for the Potomac Subregion is predicated on the concept of a system of two-lane roadways (with minor exceptions) with limited opportunity to expand roadway capacity. This is a policy consideration not related to the projected traffic demands on the roadways but is intended to preserve the present visual aspect and character of the community. In fact, the projected future traffic volumes would warrant widening of some roadways. The policy decision to not widen particular roadways and concurrently allow development to occur will result in congestion on some roadways and a lower level of service than would otherwise be acceptable. Capital project recommendations to increase transportation capacity reflect this policy which limits roadway widening and anticipates future reductions in roadway level of service in the planning area. Roadways identified as critical are projected to exceed capacity and experience congestion in excess of that generally regarded as acceptable (Level of Service D).

Recommendations for roadway improvements to accommodate projected traffic demands are based upon a consideration of the following possibilities:

- Increase capacities on existing roadways by widening where necessary;
- Provide new roadways to meet carrying capacity demands when possible;
- Accept congested operation on some roadways.

Recommendations for roadway widenings are extremely limited in order to maintain existing highway configurations as a matter of policy to retain the rural aspect of the Subregion. The possibility of providing or extending new roadways in the Subregion is extremely limited due to existing development patterns. Extensions of Montrose Road and Democracy Boulevard to Falls Road as shown on the highway plan will provide additional carrying capacity, will link directly to I-270 and will expand or augment the network of two-lane roadways. These extensions are assumed in the analysis as shown on the Transportation and Zoning Plan Map.

One possibility for diverting traffic from River Road and away from Potomac Village would be the extension of the George Washington Memorial Parkway on the Maryland shore of the Potomac River to intersect with River Road at Piney Meetinghouse Road, which could divert considerable traffic from both River and Persimmon Tree Roads. This facility is not recommended here because the National Park Service has consistently taken a stand against such a major commuter facility as being too disruptive to the C & O Canal National park.

Montrose Road Extension. Problems are currently encountered on the Falls Road/Seven Locks Road links to the City of Rockville and I-270 at Montrose Road. About 5,700 trips per day now on Falls and Seven Locks Road could be diverted to Montrose Road if that roadway were to be continued west of Falls Road. The proposed interchange at Falls Road with I-270 could relieve congestion on Seven Locks Road but not on Falls Road or at the intersection of Falls Road and Seven Locks Road. Because the existing routing is circuitous and inefficient, the Plan recommends extension of Montrose Road from its present terminous at Seven Locks Road west to Falls Road. This will provide a much needed cross-County link from the Potomac/Cabin John area and relieve congestion on the northern sections of both Falls Road and Seven Locks Road. A two lane extension with bikeways would be constructed in the existing 300 foot right-of-way previously reserved for the Rockville Facility. The classification of the roadway would be changed from a freeway to an arterial highway. However, the 300 foot right-of-way would be retained to minimize air quality and noise impacts and to allow for visual screening and berming.

Seven Locks Road. The extension of Montrose Road will provide some relief to the section of Seven Locks Road from Tuckerman Lane to Montrose Road. The adopted FY 80-85 Montgomery County CIP has construction funding for intersection improvements on Seven Locks Road at Montrose Road, Post Oak Road and Tuckerman Lane. This project will provide interim relief. When the widening to four-lanes is required it is recommended that the existing paved shoulders be curbed and thus achieve a 48 foot paved cross-section.

The section of Seven Locks Road from River Road north to Greentwig Road becomes hazardous during wet or icy weather due to the severe grade at River Road. Because of the locations of existing houses and driveways along Seven Locks Road, the existing grade cannot be changed enough to eliminate this condition if the existing alignment is retained. If feasible from an engineering standpoint, the Plan recommends realignment of Seven Locks Road to the west, as shown on the Zoning and Transportation Plan (Map 26). The Plan recognizes that access to existing and approved residences may be impaired or that other situations not consistent with good design practice may result from the proposed realignment and, therefore, recommends that if further engineering studies show that realignment is not feasible, the existing alignment should be considered as the Master Plan recommendation. In accordance with this, those properties which would have been affected by the realignment shall not be required to dedicate right-of-way nor be hampered from developing if the proposed realignment is found by the Planning Board to be not consistent with good design practice.

Route 28. Another problem area at this time is on Maryland Route 28 between Muddy Branch Road and I-270. Based on an Average Daily Traffic analysis, this section of roadway is reaching a level of critical congestion. Analyses of Route 28 intersections show them to be currently operating at an acceptable level of service. This indicates that intersections are capable of handling more traffic than can be adequately carried on links between intersections or that intersection approach capacity is constrained. Route 28 is a very important element in the Potomac Subregion Plan. Traffic from residential development oriented to the I-270 Corridor employment centers, the Shady Grove Medical complex, and Metrorail stations at Shady Grove and Rockville will find Route 28 a very desirable travel path if sufficient capacity is provided. However, if the roadway is congested, drivers will experience travel delays and will seek alternate routes on secondary roads through the Potomac Subregion which would not be convenient otherwise. The roadway will have to be widened, however, within the 10-year period if an acceptable operating condition is to be maintained, because of growth in the entire western part of the County as well as within the Subregion.

It is recommended that Maryland Route 28 be programmed for construction as a four-lane divided facility on its relocated alignment between Muddy Branch Road and I-270 as a high priority item in the Maryland Department of Transportation Consolidated Transportation Program. Additionally, the section from Muddy Branch Road to Riffle Ford Road should be programmed for construction within a 10-year time period.

Democracy Boulevard Extension. The extension of Democracy Boulevard to Falls Road will provide additional east-west highway capacity, will expand the network over which traffic can be more uniformly distributed, and will link Falls Road directly to I-270. The extension can effectively divert traffic which would otherwise reach Democracy Boulevard via Bells Mill Road/ Democracy Lane, Kentsdale Drive/Bradley Boulevard, and to a lesser extent, River Road. However, based upon the projections of critical congestion on River Road, part of the traffic from west to Falls Road, which would otherwise use River Road as a through route, would be able to use Democracy Boulevard extended. This could amount to a maximum of about 5,000 daily trips and would draw from lower Falls Road and South Glen Road in particular. A diversion of this magnitude is somewhat unlikely, but it represents the amount of traffic diversion necessary to achieve a marginally acceptable level of congestion on River Road in the 10-year analysis period.

It is recommended that Democracy Boulevard be extended as a two-lane roadway to Falls Road within the 10-year period. An alignment different from the previous Master Plans is proposed to connect Democracy Boulevard with Kentsdale Drive. The roadway is to be located so as to be as far away as possible from existing residences. No connection to Carmelita Drive is proposed. This alternative would minimize environmental impacts on Buck Branch and reduce future traffic volumes on Falls Road between Kentsdale Drive and the existing proposed alignment of Democracy extended, thus reducing turning movement conflicts.

Highway Classification

Montrose Road and Democracy Boulevard extensions, Maryland Route 28 widening and Seven Locks Road widening between Tuckerman Lane and Montrose Road are the only roads recommended for improvement in the recommended Capital Improvements Program. All other roadways are recommended to remain in their existing configuration. This limited program will provide some accommodation to growth in the Subregion, but is insufficient to forestall the increase of congestion on certain roadway segments, such as:

River Road	-	West	of	Falls	Road	to
		Seven	Loc	ks Roa	d	
Seven Locks Road -		Bradle	y	Boule	vard	to
		Demo	crac	y Boule	evard	

	-	Tuckerman Lane to Mont- rose Road
Tuckerman Lane	-	Seven Locks Road to I-270

The proposed highway classification plan, Map 26, basically retains the highway classifications of the previous Master Plans and the Draft Master Plan of Highways. This will allow the retention and protection of rights-of-way and set-backs during the on-going subdivision process. It is possible that the perceived need or commitment to widen many of the area's roadways may never develop; however, preservation of highway rights-of-way will allow these long-term needs to be accommodated in the event that a decision to widen the roadways is made by a future generation. Additionally, the availability of ample rights-of-way will enhance safety and allow for intersection improvements; they also provide space to offset possible effects of auto emissions and roadway noise. Visual screening for residences also becomes possible when ample rightsof-way are preserved.

Regional Facilities

All of the highways discussed in the foregoing are essentially internal facilities which have the primary function of serving the Subregion. "The County Draft Master Plan of Highways," however, recommends two additional facilities which pass through the Subregion but primarily serve regional needs. These are the Outer Beltway/Inter-County Connector and the Rockville Facility. Because these roadways would extend across most of Montgomery County, an analysis of their proposed need would not be logical for only the small portion of the County represented by the Potomac Subregion. The Maryland State Department of Transportation (DOT) has begun a project development study



POTOMAC-CABIN JOHN AND VICINITY P.A. 29

RECOMMENDED HIGH WAY IMPROVEMENT





TRAVILAH AND VICINITY P.A. 25

RECOMMENDED HIGH WAY IMPROVEMENT





DARNESTOWN AND VICINITY P. A. 24

RECOMMENDED HIGH WAY IMPROVEMENT



..... Planning Area Boundary

on a portion of the Inter-County Connector to the north and east of the Subregion which will include a determination of the need for the Rockville Facility. Because of the complexity of Federal requirements, the study will take about three years.

The limit of the Maryland State DOT study for the Rockville Facility is I-270. Therefore, it is recommended that the freeway designation be deleted from the Master Plan west of I-270 and be reclassified only as an arterial highway while retaining the existing 300 foot right-of-way. The limit of the Maryland State DOT study for the Inter-County Connector is the Great Seneca Highway. Therefore, it is recommended that the freeway be deleted from the Potomac Subregional Plan and that the Gaithersburg and Vicinity Master Plan be amended to reclassify the section from Maryland Route 28 to the Great Seneca Highway as a major highway.

Bikeways

While travel by bicycle cannot be considered to provide a significant alternative to the automobile for the normal work trip, the low density and rural nature of the Subregion makes this an excellent area for social and recreational bicycling. Within the Subregion virtually the only independent mode available to young people below the driving age is the bicycle. Bikeways which provide a safe traveled way can make available a mode of travel which is inexpensive, consumes minimal amounts of natural resources, involves low space requirements, and provides both competitive sport and recreation.

Although the bikeway element of this Plan incorporates all of the recommendations of the Montgomery County Master Plan of Bikeways, it provides only the skeleton of a system to be provided by public agencies. However, this Plan does recommend that the bikeway network in the Subregion be expanded through the subdivision process. As new subdivisions are built, provision should be made for an interconnecting system of bikeways which allows safe and convenient transit through the subdivisions to activity centers where cyclists will wish to go.

The criteria for planning bikeways as enumerated in the Master Plan of Bikeways are as follows:

<u>Continuity</u> - Bikeways should be developed as part of the continuous County-wide system, providing connections to adjacent jurisdictions.

<u>Access</u> - Bikeways should be located to provide convenient access to serve residential areas and activity centers (such as shopping centers, schools and recreation centers) where bicycle usage is anticipated. Bike parking facilities should be provided at activity centers as integral components of the bikeway system.

<u>Safety</u> - Bikeways should be located to provide protection for cyclists by minimizing conflicts with pedestrians and other transportation modes.

<u>Purpose</u> - Bikeways should be developed to serve the variety of trip purposes and the age and skill groups that will utilize the facilities.

A number of bikeway projects are scheduled by the adopted County Capital Improvements Program (CIP) to be completed during the next five to six years. Proposed but unprogrammed facilities would be built beyond the six year CIP period and are shown only as possible routes. Bikeway classifications shown on the Transportation Plan map are defined as follows and are illustrated on page 101.

CLASS I: Bike Path/Trail An independent bikeway on a separate right-of-way or easement (combined with a pedestrian walkway where suitable).

CLASS II: Bike Lane -- A restricted lane on a roadway, designated by painted stripes or by physical barrier and signed for the exclusive or semi-exclusive use of bicycles.

CLASS III: Bike Route -- A roadway shared by motor vehicles, bicycles, and/or pedestrians and designated by signing only.

Each design type represents a different degree of safety and cost. Properly located and designed, Class I bike paths can afford the greatest relative degree of safety from conflicts with motor vehicles and can be parallel to, or sometimes away from, roadways. These bike paths, however, involve the highest construction costs and may result in conflicts between cyclists and pedestrians, and cyclists and autos at intersections. Such paths attract mixed use by pedestrians, joggers, and bicyclists; thus, the path becomes a benefit to a broader community of users. This mixed-use situation is tolerable to the majority of users when there has been adherence to adequate design standards which provide for good riding surface, width, and sight distance visibility. Bike paths should be developed, wherever possible, to maximize bicycle safety and usage. Crossflows should be minimized; and intersections with streets must be carefully designed or grade separated when feasible.

A Class I path usually also serves as a sidewalk when developed along a roadway. This is acceptable when there is minimal pedestrian interference, few crossflows, and a smooth, clean surface. Where a bikeway along a road is indicated, adjacent Class I path construction is recommended when:

- it is not economical to redevelop an existing road to a wider, adequate cross-section,
- adjacent space is wide enough for a bike path, or
 - if the roadway is such that the volume and speed of auto traffic makes on-street cycling too dangerous.

Class II bike lanes on roadways are safe, costeffective bikeways where extra pavement width or shoulder area is available and adjacent auto volume is not too heavy or fast. Although turning movements must be made with care, bicycle safety is enhanced due to the extra width and distance from parallel vehicles and due also to the auto driver's awareness of the bicycle on the road.

While Class III bike routes do not provide the cyclist with exclusive riding space (separation from auto and other traffic), they do function as an integral component of a bikeway network. Class III bike routes are employed in the network to connect Class I or Class II sections of the system--thus providing continuity--where it is physically or financially prohibitive to construct an exclusive bicycling facility, or where traffic volumes are very low. The signing along Class III bike routes functions as a directional guide to the cyclists, similar to highway route marking.

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typical bikeway cross sections

• note: increased width & lane delineation must be considered where warranted by volume of users.



frails and the owners of the land

The criteria used in delineating this network are uch the same as those used for planning the bikeway stwork, such as the need for continuity and avoidance conflict with other users. The bridle trait network own on the Zoning and Transportation Plan is a gested one, subject, however, to selective modificaon and relocation as additional residential subdivisions e approved.



Equestrian Trails

The Potomac Subregion now has an informal network of bridle trails. Most of these trails exist only though the goodwill of the owners of the properties which they traverse. Since there is no County mechanism for formalizing these trails, this Master Plan delineates a proposed trail network for possible embodiment in formalized agreements or easements between private parties and organizations such as Potomac Trails and the owners of the land.

The criteria used in delineating this network are much the same as those used for planning the bikeway network, such as the need for continuity and avoidance of conflict with other users. The bridle trail network shown on the Zoning and Transportation Plan is a suggested one, subject, however, to selective modification and relocation as additional residential subdivisions are approved.





LAND USE AND ZONING PLANS

SUMMARY

Of the 56 square miles of land encompassed by the Subregion, approximatley 35,110 acres or 98 percent is zoned for residential use. Only 37 percent or 13,161 acres are actually in residential use at present. The remaining land in residential zoning is split between resource use such as farming, mining, parkland, and undeveloped or unused land. If the Subregion were to develop to its potential under existing zoning, an average density of 2.7 persons per acre would result. On a planning area basis, the average densities would be as follows:

> Planning Area 24 (Darnestown) – 2.7 persons/acre Planning Area 25 (Travilah) – 1.9 persons/acre Planning Area 29 (Potomac) – 3.5 persons/acre

The Plan recommends that most of the present zoning pattern continue (see the Proposed Land Use and Proposed Zoning Maps, which are fold-outs with this report). However, recommendations for use of the Rural Zone in Planning Area 24 (Darnestown) would result in decreasing the average ultimate density in that Planning Area to 2.3 persons per acre.

The Plan also recommends that two additional small convenience shopping centers be located within the Subregion. Because of the proposed rezoning of some properties which are currently zoned commercial to residential, the total amount of land zoned for convenience-commercial is decreased from the current total of 60.8 acres to approximately 50 acres. New employment centers or regional shopping centers were not considered to be appropriate within the Subregion which is characterized as a low-density residential area. The only large parcel of land currently zoned for industrial use is Rockville Crushed Stone quarry to the west of Travilah Road. Based on conversation with the operators of the quarry, it is expected that it will continue to be active well beyond the term of this Plan.

The only other major employment center within the Subregion is the David Taylor Model Basin in the Potomac Planning Area. This is a Federal facility located south of MacArthur Boulevard on land zoned R-200. Immediately adjacent to the Subregion and partly within it is the Montgomery Mall/Davis tract complex in the vicinity of the Democracy Boulevard and I-270 Interchange. This area is currently only partially developed and could provide a significant additional amount of commercial and prestige office space with relatively convenient access from the Subregion.

The Plan recommends that the area bounded by I-270 on the east, Montrose Road on the south, Seven Locks Road on the west, and the Rockville City line on the north be developed in light industrial or office uses. The uses to the north of this area are currently a local shopping center (Mini Mall) and public uses including the County Maintenance Facility, Police Station and Detention Center. Also recommended for light-industrial or office uses is an area to the east of I-270 which is currently surrounded by the Rockville City boundary line and is within the city's maximum expansion limits.

To the north of the Subregion, along Maryland Route 28 in the Gaithersburg and Vicinity Planning Area, an employment center is developing which includes the Montgomery County Medical Center, the Public Services Academy, and other related uses. The development of this area will create a demand for additional housing in the Route 28 corridor which suggests that development of the residentially zoned land to the south of Route 28 be given high priority for early sewer service and that a widening of Route 28 be programmed as quickly as possible.

Public Facilities

Because of the changing demographics mentioned earlier in this report, the Plan does not foresee the need for new schools at least until 1985. Beyond the 1985 time period, one additional school may be needed in the Darnestown Planning Area. Other public facilities recommended for the Plan include a library in Potomac Village, a fire station in the Darnestown area, and possibly an indoor recreation facility in the Potomac Planning Area. Several school sites which are not expected to be needed for school use should be developed as local parks.

PLAN OBJECTIVES

The Master Plan for the Potomac Subregion builds upon and selectively modifies the earlier adopted Master Plans. The new Plan makes use of more refined population projections and more sophisticated zoning tools which became available since the adoption of the Master Plan for Potomac-Travilah and Vicinity. The zoning tools specifically recommended for use in this Plan are:

 The Rural Zone which requires a minimum lot size of five acres;

- Modified Townhouse (R-T) Zones which would allow townhouse development in the Subregion, but at densities of six, eight or ten units per acre; and
- The two-acre Single-Family Residential Cluster Zone (RE-2C) for those environmentally sensitive areas which would be significantly impacted by developing as standard two-acre subdivisions.

This Plan reaffirms the concept of a low-density residential wedge for most of the Subregion, but recognizes that there will be, and should be, some additional compatible growth in the Subregion. Population forecasts show a 33 percent growth in the Subregion for the period, 1978-1995. As important as the growth, is the forecast of population composition. The population of the Potomac Subregion is aging and the birth rate is declining. One of the major impacts of this change in demographic composition is that the growth in dwelling units within the Subregion will not be proportional to the growth in population; dwelling units will increase at a faster rate. Smaller families will mean a greater number of houses for fewer people.

A conservative estimate of the growth in dwelling units over the twenty-year period is that 62 percent more houses will be needed to accommodate only 33 percent more people. The change in household composition also has implications for the kinds and amounts of community and public facilities needed to accommodate growth. Smaller family size implies that there will be more time for recreation and, indeed, the participation rate for sports activities is increasing throughout the County. Fewer classrooms per household will be required because of the expected continuing decline in the ratio of school age children per household. If auto travel is to be kept to a minimum, convenience-goods shopping facilities must be provided in areas readily accessible to both existing and future residents of the Subregion.

If the Subregion is to retain its desirability as a residential area in the face of expected growth, the environment must be respected and managed so as to conserve the physical character of the area. Stormwater management concepts, developed for the preservation of stream valleys, must be strictly enforced. Floodplains must be respected and areas which are crucial to the survival of the many species of flora and fauna now found in the Subregion must be preserved to the maximum feasible extent.

An objective of the Plan, then, is to maintain the character and desirability of the area by using predominantly low-density, residential zoning. The infrastructure to be provided is planned so as to serve only the needs of the Subregion.

The only major rezonings proposed in the Subregion are in the western portion of the Darnestown Planning Area, and the area between the Potomac River and River Road from Blockhouse Point to Persimmon Tree Road. The rezonings in the Darnestown Planning Area are proposed to provide a transition between the five-acre minimum lot size Rural Zone and the more dense areas to the east. The rezonings along the Potomac River are proposed to allow clustering of dwelling units within the two-acre minimum lot size in RE-2C Zone to provide visual continuity with the C & O Canal National Park and to preserve those environmentally sensitive and naturally unique areas worthy of preservation by discouraging development of the ravines and steep slopes adjacent to the Canal property. The Plan recommends two new local-commercial centers to be located within the Subregion and a possible expansion of commercial zoning at an existing center to complete a logical network with the existing convenience centers. Commercial centers will be located so as to be conveniently accessible to most households, both existing and future. The facilities are envisioned as small shopping areas providing only basic convenience goods. The only "shopping goods" center is at Montgomery Mall which, together with the nearby Rockville Pike commercial corridor, will meet all of the Subregion's future needs for comparison shopping.

It is a goal of the County Council to provide for a balanced housing supply so that persons of varying income levels, age backgrounds, and household characteristics may find suitable housing appropriate to their needs. It is the intent of the County to provide for moderate- and low-cost housing as well as high-cost housing; to provide for multi-family as well as singlefamily housing environments; and to provide for renter as well as owner-type occupancy wherever possible in adopting area master plans.

It is an objective of the Master Plan for the Potomac Subregion that land use recommendations will provide for an adequate supply of housing within various price ranges and housing types.

To meet this objective, the Plan recommends the use of Planned Development Zone at varying densities in specific locations throughout the Subregion and the use of the Residential-Townhouse (R-T) Zones. It is also recommended that the Bradley Junior High School site be designated as a potential "Public Facility Area" for future investigation as to suitability for public uses including recreation and affordable housing. The Bradley Junior High School site should only be
considered for designation as a Public Facility Area if the site is surplussed by the Board of Education. The site is also recommended for a local park and if found suitable for affordable housing, joint usage should be considered. The Plan also recommends consideration of a slight increase in density to an average yield of five to six units per acre for the 6.33-acre tract in the northwest quadrant of the Seven Locks Road/Tuckerman Lane intersection currently owned by Carl Freeman Associates, Inc.

PARKS AND RECREATION

The provision of outdoor recreation and conservation areas play an important part in planning for the Potomac Subregion. The Subregion currently has over 2,500 acres of public parkland. While this is an extremely large amount of acreage in relationship to the population of the Subregion, 85 percent of the existing parkland consists of conservation-oriented parks, mainly in the stream valleys.

The Potomac Subregion contains many different types of parks ranging from small Neighborhood and Local Parks to large-scale Regional and Stream Valley Parks. The parks can be classified into the following categories.

> <u>Neighborhood Parks</u> are small parks for unscheduled use by residents of the surrounding neighborhoods. These parks contain such facilities as tot lots, tennis and multi-use courts, and playfields. These parks are usually five acres or less and are intended to provide informal walk-to recreation for nearby residents. They are generally unlighted and would not normally contain a shelter.

- Local Parks serve a larger area than Neighborhood Parks and contain ballfields for scheduled use. They are usually about ten acres and include such other facilities as tennis, basketball, and other courts: shaded sitting or picnic areas; playground equipment; and perhaps a shelter and limited parking. The service area of a Local Park is approximately that of an elementary school and these parks are frequently located next to school facilities, and are known as park/schools. Park/schools offer a concentration of recreation facilities, substantial programming opportunities, and often cost savings in acquisition and development. Indoor school space can also be used to serve after school and summer recreation needs.

In a few cases, a Local Park can be included within a Stream Valley Park or other unit, or even at the edge of a Regional Park, to serve a local area if other suitable land is unavailable.

Community Parks are relatively large parks of 20 acres or more. They serve as family recreation centers, offering a range of facilities for all age groups. Some Community Parks contain a large community building with a gymnasium and meeting rooms for recreation classes, civic groups, senior citizens, etc. Concentration of facilities such as athletic fields; tennis and other types of courts, picnic/playground areas; and parking for cars and bicycles provide the community with an attractive facility that is within five- to tenminutes commuting time by car or bicycle and has the advantage of more effective programming and more efficient maintenance than Local Parks.

- Regional Parks combine conservation and recreation in large parks of over 200 acres. They offer a wide range of recreational opportunities yet reserve at least two-thirds of the park for conservation-related purposes. Regional Parks contain such facilities as large picnic and playground areas, golf courses, equestrian centers, water-oriented facilities, camping and athletic complexes. These parks are designed for family recreation, and encourage fairly long visits involving a variety of activities.
- Stream Valley Parks provide valuable open space and passive recreation areas with adjacent usable land developed for active recreation in many locations. The Stream Valley Park system provides a green network along streams extending throughout Montgomery County. It provides public access to streams and to trails for hiking and bicycling. Stream Valley Parks also protect the major stream valleys from flooding, erosion, and sedimentation. These parks are left predominantly in their natural state, but some areas are developed for picnicking and informal recreation. In some cases, Neighborhood or Local Parks are incorporated into Stream Valley Parks.
- <u>Conservation Area Parks</u> are acquired specifically because they have significant natural features. Development of these parks is nonintensive and primarily focus on interpreting and protecting the natural features within the park. Limited interpretive facilities would be developed in parks acquired for their conservation value; other compatible uses such as

hiking, fishing, horseback riding, and limited picnicking could be included where feasible. The size of Conservation Area Parks is based on the area necessary for preservation of significant natural features.

In the adopted <u>FY 81-86 Capital Improvements</u> <u>Program</u>, there are seventeen projects programmed for expansion and/or development of the park system within the Potomac Subregion. The Plan recommends further expansion of the park system within the Subregion to include an additional Stream Valley Park along Rock Run and a Local Park in the vicinity of Glen Road and Travilah Road.

The Park, Recreation and Open Space Master Plan indicates that the Potomac Subregion has a very high team sport participation rate and correspondingly high need for additional ballfields. In order to accommodate these anticipated needs, the Plan identifies several sites which should be developed with ballfields and other local, recreational facilities. Some of these sites were purchased by the Montgomery County Public School System but are not expected to be needed for new school facilities.

Chesapeake and Ohio Canal National Historical Park

In 1971, Public Law 91-664 established the Chesapeake and Ohio Canal National Historical Park, and expanded the park's boundaries from 5,257 to 20,239 acres. The National Park Service prepared a general plan for managing the park, which was published in 1976. The plan calls for the stabilization and partial restoration of the Canal and its structures, the preservation of the natural area surrounding it, the interpretation of historical and natural values associated with the Canal, and the provision of outdoor recreation. The park's primary resource is the physical remains of the Canal including its bed, towpath, aqueducts, dams, culverts, locks, lockhouses, and other associated structures or their ruins. Since the Canal ceased operation in 1924, little stabilization of the structures has taken place. The structures have been subjected to freezing and thawing action, and four major floods have occurred. Numerous breaks in the towpath embankment, erosion of the clay liner in the Canal bed, and damage to the numerous historic structures present enormous reconstruction problems.

The historic and natural resources, access and existing facilities, adjacent land use, and existing and newly acquired parklands are discussed for each section of the Canal within the Potomac Subregion Planning Area.

> Lock 8 to Anglers Inn (4 miles). This section contains "Seven Locks," which raised the Canal 56 feet in 1% miles as it moved from the flood plain to the Palisades in preparation for the route around Great Falls. The Carderock Pivot Bridge is also in this section. The section's natural attributes include the rock formations of the Palisades, rare stands of eastern hemlock and fragrant sumac, and abundant wildlife.

> This section has three access points and parking for 460 cars is provided at the 100-acre Carderock Recreation Area. Most of the activity at Carderock is not Canal oriented; group picnicking and rock climbing are the predominant pursuits, with little impact on the Canal itself. There is some conflict between user groups over parking at Carderock. No additional acquisition of lands was provided for in the enabling legislation, but most

of the adjacent lands are under the jurisdiction of the National Park Service.

Anglers Inn to Lock 21 (4.2 miles). This section contains many historical resources, including six locks, Great Falls Tavern (Crommelin House), and gold mines. The predominant natural resources are the Potomac's Great Falls, the geological formations of the Piedmont, and the rocky gorges including Widewater and Mather Gorge. Rare species of this area include stands of American chestnut and fragrant sumac, and concentrations of the Allegheny Mound Ant.

This is a long-established visitor use area which includes a 535-car parking lot, food and bicycle concessions, the Great Falls Tavern Museum and Administration Building. Three gravel lots are provided at Angler's Inn. Visitors to this area have been traditionally attracted to Great Falls rather than the C & O Canal. This section also includes the 340-acre Gold Mine tract which extends from Angler's Inn to Great Falls. No additional land is being acquired in this area.

Swains Lock to Violets Lock (5.6 miles). This section of the Canal is rewatered but contains limited historic features, including two locks and accompanying lockhouses. The 125-foot-high cliffs of Blockhouse Point Regional Park and the Dierrsen Waterfowl Sanctuary dominate the natural resources of this section.

Three access points are now available to Canal users in this section. Swains Lock provides a 25car parking lot and canoe and food concessions. Pennyfield Lock has informal parking available for approximately 100 cars. Additional lands are being purchased at Pennyfield Lock, which will permit construction of a small parking lot for towpath users. There is a 45-acre park area at Watts Branch.

Seneca - Violets Lock to Seneca Quarries (1.6 miles). The quarries from which much building stone was barged to Washington are located here, and the remnants of the stone mill and turning basin are still in evidence. There is a 75-car parking area at Seneca, with access from Rileys Lock Road. A boat ramp exists which serves the 5-mile slackwater created by a dam at Violets Lock. The area is extremely overcrowded on weekends.

Historic Sites

The Potomac Subregion is rich with history. One hundred sites, with possible historic significance, have been identified within the Subregion and are catalogued in the Locational Atlas and Index of Historic Sites in Montgomery County, Maryland, which was published by the Park and Planning Commission in October 1976. These sites, shown on the Existing Land Use map included with this Plan, are listed below and are indexed as they appear in the Atlas:

Planning Area 24

- 24-1 Seneca Baptist Church (Old)
- 24-2 Darby Farm (Kramm)
- 24-3 Darby/Offutt Farm
- 24-4 Darby House
- 24-5 Black Rock Miller's House
- 24-6 Black Rock Mill
- 24-7 Higdon (Charles) House

24-8 McAtee House 24-9 Hoskinson House 24-10 Higgins (Samuel) House 24-11 Beall (Rudolph) House 24-12 Beall/Vinson Farm 24-13 Pleasant View Church #2 24-14 Jones/Clagett Farm 24-15 Mills House 24-16 Poplar Grove Baptist Church 24-17 Dufief Mill Site 24-18 Small (Andrew) Academy Site of Barn 24-19 Darnestown Historic District 24-20 Purdum (James) Farm 24-21 Pleasant Hills 24-22 Benton (Nathan) House 24-23 King House 24-24 Montanverde 24-25 Seneca & Aqueduct 24-26 Seneca Lock/Riley's Lockhouse 24-27 Violet's Lock & Feeder Dam 24-28 Seneca C.M.E. Church 24-29 Magruder (S. Thomas) Farm

- 24-30 Woodbyrne (Old Offutt Farm)
- 24-31 Clagett (Nathaniel) Farm (Sunrise Farm)
- 24-32 Esworthy House

Planning Area 25

- 25-1 Garrett Farm
- 25-2 Maple Springs Farm
- 25-3 Ward Cemetery
- 25-4 Crown (H.) House
- 25-5 Davis Store & Hunting Hill
- 25-6 Amberlea Farm
- 25-7 Jones (Z.N.) (Potomac Horse Center)
- 25-8 Mt. Prospect
- 25-9 Poole (W.H.) Farm
- 25-10 Travilah (school, church, etc.)

- *25-11 Magruder (Wesley) House
- 25-12 Query Cemetery
- 25-13 Harris House
- 25-14 Tobytown Cemetery
- 25-15 Pennyfield Lock
- 25-16 Bell's Mill House
- 25-17 Swain's Lock
- 25-18 Perry (Elbert) Farm
- 25-19 Semmes Farm
- 25-20 Creamer (John) House
- 25-21 Creamer (Susan) House
- 25-22 Beale Estate
- 25-23 Jones (Samuel) House (The Knob)

Planning Area 29

- 29-1 Stone Springhouse
- 29-2 Claggett House
- 29-3 Glen Store & Post Office
- 29-4 Connell (Lucy) Farm
- 29-5 Pierce (J.) Farm
- 29-6 Marwood
- 29-7 McDonald (Cap't. John) House
- *29-8 Potomac Village (Perry House & Store)
- 29-9 Willett (Dr. C. E.) House
- 29-10 River Oaks Farm
- 29-11 Potomac Methodist Church & Cemetery
- 29-12 Garrett (H.) House
- 29-13 Meyers House
- 29-14 Jackson House
- 29-15 Zion Church/Scotland
- 29-16 Locust Grove (Magruder House)
- 29-17 Bell's Mill Site
- 29-18 Franciscan Center (Kendall Estate)
- 29-19 Offutt House
- 29-20 Offutt House (River Road)
- 29-21 Formstone Houses

- 29-22 Oaklyn Houses
- 29-23 Saint Gabriel's Cemetery
- 29-24 Ford (Samuel) House
- 29-25 Lynch House
- 29-26 Caroll School
- 29-27 Gold Mines
- 29-28 Lock #20 Great Falls
- 29-29 Water Supply Building
- 29-30 Great Falls Tavern/Crommelin House
- 29-31 Angler's Inn
- 29-32 Cropley House
- 29-33 Rock Run Gold Mines
- 29-34 Hill Houses & Store
- 29-35 Potter House
- 29-36 Ellerslie/Saunders House
- 29-37 Hermon Presbyterian Church & Cemetery
- 29-38 Glenmore
- 29-39 Gibson Grove Church
- 29-40 Magruder's Blacksmith Shop
- 29-41 Stoneyhurst
- 29-42 Quarries
- 29-43 Magruder's Mill Runs
- 29-44 Wright (Frank Lloyd) House
- 29-45 Trolley Powerhouse
- * Included in the Master Plan of Historic Preservation.

The historic significance of a site or structure may depend on many factors other than age. While the most common criteria are, of course, age and the occurrence of some significant historic event, a site or structure can have significance even if it is relatively new and is unassociated with major historic events. For instance, a house which may be one of a remaining few having a distinctive architectural style that was once prevelant in the area, would be considered to have historic significance because it exemplifies the "heritage" of the area. Conversely, another house that is unique to an area may also be considered to have historical significance because of its uniqueness.

The sites within the Subregion range from historic houses and churches to the site of a slave cemetery at Tobytown. There are several sites on which the remains of mills can be found. Farms are included in the list, as well as gold mines which were actively mined after the Civil War. Other areas with historic significance will undoubtably be found. There are indications that significant prehistoric Indian camp sites may be found along the Potomac River. On the other hand, some of the sites which are listed in the Atlas may be found to be devoid of historic significance.

One of the major obstacles to the effort to save historic sites has been the lack of information regarding the significance of these sites. This, coupled with the absence of controls on removal of sites and incentives for site preservation, has allowed many possibly invaluable historic sites to be lost to development.

Over the past several years, however, this situation has begun to change. The Montgomery County Building Code currently contains an "Anti-Demolition Ordinance" which prohibits demolition of a structure which has been identified as having possible historic significance until the importance of the structure can be determined. However, this ordinance is only considered to be temporary.

A Master Plan and Ordinance for Historic Preservation was adopted in July 1979. This plan includes only two of the 100 sites located within the Subregion--with the exception of those sites in the C & O Canal National Park.

While it is important for all of the sites to be researched in order to determine the significance of each, there are several sites within the Subregion which have been researched to some extent and should be considered for inclusion in the <u>Master Plan for Historic</u> Preservation. These are:

- 25-14 Tobytown Cemetery
 29-3 Glen Store & Post Office
 29-16 Locust Grove (Magruder House)
- 29-31 Angler's Inn
- 29-40 Magruder's Blacksmith Shop
- 29-44 Frank Lloyd Wright House

One site, the Union Wesley Methodist Church Cemetery, located north of the Piney Meetinghouse Road intersection with Piney Glen Lane, does not appear on the <u>Historic Sites Atlas</u>, but is reputed to contain the graves of at least 100 former slaves and free blacks. It also seems that Piney Meetinghouse Road got its name from the church or "meeting house" which was located there.

In conjunction with this effort, the Sugarloaf Regional Trails organization (SRT) has organized a volunteer program to research the sites which have been identified on the Historic Atlas. Due to the large number of such sites, it is not possible for SRT to finish the research because the grant by which SRT is funded expired in December 1978. Much of this work will have to continue by unsupervised volunteer workers.

DARNESTOWN PLANNING AREA (#24)

Residential Areas

The westernmost area in the Subregion is in the rural lower reach of the Seneca Creek Valley. It consists of operating farms, large estates and vacant fields and woods and contains only a very few large-lot subdivisions. On the County <u>General Plan</u>, this area is most decisively a part of the green "Wedge" area. This Plan recommends much of this area to be rezoned to the Rural Zone which requires a minimum lot size of five acres.

While not a "Prime Agricultural" area, this area does contain farmland worth preserving and is considered a "Secondary Agricultural" area. In conjunction with this designation, the rural zoned areas should be considered for application of a five-acre cluster zone if such a zone is adopted. This area is bounded on the west by Seneca Creek; on the north by Seneca Creek and the PEPCO power line; on the east by Darnestown (Route 28), Seneca and Esworthy Roads and Muddy Branch; on the south by the Potomac River and excludes only that area north of Route 28 at Seneca Road which is currently zoned R-200 and the rural villages of Berryville and Violets Lock, also zoned R-200.

It will be noted that the area which lies west of the area included in the 1967 Potomac-Travilah Master Plan was rezoned to the Rural Zone as part of a comprehensive rezoning of the Upper County several years ago. Some of the land which was placed in the Rural Zone had previously been subdivided into recorded lots of less than five acres each. One such subdivision is Bondbrook which has average lot sizes of one acre. The Plan recommends that an area of land adjacent to this subdivision be placed in the RE-2 classification. The area to be rezoned is approximately 83 acres of a 175 acre parcel abutting the western boundary of Bondbrook with frontage along Route 28.

In order to provide a suitable transition between the Rural Zone and the more suburban areas to the east, the area between Seneca Road and Turkey Foot Road, which is now zoned R-200, is proposed to be rezoned to RE-2. The area bounded by Route 28 on the north, Turkey Foot Road on the west, and Jones Lane on the east, is proposed to remain in the R-200 Zone. However, sewer service is not be be extended into this area. This will allow variations in lot sizes due to the need to provide adequate septic drainage fields while keeping the average density of the area to one dwelling unit per acre or less. The purpose of this recommendation is to reflect the density of the development which has actually occurred in these areas to date and thus, to foster and preserve the existing character of the area. Because existing development has occurred on septic systems, lot sizes larger than the minimum permitted in the R-200 Zone were required by the County Department of Environmental Protection for public health reasons.

The amount of land to be rezoned is as follows:

R-200 to Rural	=	139 acres
RE-2 to Rural	=	1,817 acres
R-200 to RE-2	=	403 acres
Rural to RE-2	=	83 acres

Of the total area to be rezoned Rural, there are only 16 parcels, each less than five acres, which total only 25 acres. There are 10 parcels, each less than two acres, in the area to be rezoned RE-2.

The Plan also designates a portion of the area east of Jones Lane which is currently zoned R-200 as suitable for the Planned Development Zone at a density of three dwelling units per acre (PD-3). The use of this zone is recommended particularly for those areas within one mile of Maryland Route 28 which could easily be served by a "feeder bus" system upon the opening of



DARNESTOWN P. A. 24

EXISTING LAND USE



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DARNESTOWN P. A. 24

EXISTING ZONING





DARNESTOWN P.A. 24

PROPOSED LAND USE





DARNESTOWN P. A. 24

PROPOSED ZONING



Metro to Rockville and Shady Grove. To facilitate the use of mass transit, development plans for those parcels applying for the PD-3 Zone should show density clustered on the northern portion of the property.

The proposed rezonings could mean a potential reduction of 1,300 dwelling units within the planning area and would decrease the potential average density to approximately 2.3 persons per acre.

The Plan strongly recommends the use of the cluster development option in those areas where the Planned Development Zone is not used. The purpose of the cluster method of development, as defined by the Montgomery County Zoning Ordinance, is to encourage a variety of types of residential buildings while preserving limitations on density, to protect the character of existing neighborhoods, and to provide open space for common use. The cluster option is proposed for this area principally to encourage preservation of open space and those significant historic and natural features which would otherwise be lost through standard subdivision procedures.

Commercial Areas

At present, there are 13.4 acres of land zoned for local commercial use (C-1 Zone) within the Darnestown Planning Area. A large portion of this--8.8 acres--is located at the crossroads of Route 28 and Seneca Road which is the village known as Darnestown. The total commercially-zoned acreage currently accommodates 35,100 square feet of commercial floor space in addition to required off-street parking. Other existing commercial establishments are located along Seneca Road and Riley's Lock Road in the vicinity of Riley's Lock; these consist of small restaurants and carry-out food stores, plus a boat launching ramp for C & O Canal users.

Based on population and dwelling unit forecasts, the demand for convenience-commercial space within the Darnestown Planning Area will increase to 50,900 square feet by 2000. In order to accommodate this demand, the Plan recommends that the existing 4.4 acres of commercially zoned land on the north side of Route 28 at Seneca Road (Route 112) be developed as a small local shopping center. Much of the area now zoned for commercial use is within the "Darnestown Historic District" as depicted in the Locational Atlas of Historic Sites, and is also shown on the Existing Land Use fold-out map included with this report. Many of the structures within the historic district date from the early to mid-1800's. It is strongly recommended that existing structures be renovated and adapted as convenience commercial outlets to meet the need for future commercial space in this area. An adaptive reuse policy of restoring historic structures to their original appearance, along with some selective, harmonious new construction, would be an asset to the area. This policy is aimed at maintaining the picturesque, rural character of the Darnestown Village, yet meeting the needs of future residents and avoiding long shopping trips for everyday needs.

Public and Community Facilities

Schools

Within Planning Area 24, the need for additional school facilities is seen to be slight. Additional enrollment in elementary schools is forecasted to increase by about 70 pupils by 1985. An increase of this magnitude would put the existing Darnestown Elementary School above its approximate capacity. The major portion of this surplus can be absorbed into the Travilah Planning Area schools. Recognizing the difficulty of making enrollment forecasts beyond this time period, the Plan recommends that the site of the proposed Jones Lane Elementary School be retained by the Montgomery County Public School System until the need beyond 1986 can be more accurately determined.

Enrollment in secondary schools is forecast to remain constant through 1986.

Parks

The adopted <u>Capital Improvements Program</u> contains two parks to be developed within the Darnestown Planning Area 24 over the next six years:

- Darnestown Local Park
- Blockhouse Point Conservation Park

Land has already been acquired for the Darnestown Local Park and the park is scheduled to be completed in FY 82. This park is located on the north side of Route 28 to the west of its intersection with Seneca Road.

Of the 642 acres encompassed by the park-taking line for the Blockhouse Point Conservation Park, 594 acres are acquired. Thirty-eight additional acres are pending acquisition during FY 80. Development of the park, which is proposed for FY 85, could include primitive camping and picnic areas, interpretive and nature trails, bridle trails, and parking facilities, subject to consultation with community groups.

Aberdeen Local Park was projected to be part of a park/school complex and would have been adjacent to

Jones Lane Elementary School on the west side of Jones Lane, approximately 0.7 miles south of Maryland Route 28. This project has been deferred beyond the six year programming period. Because of the uncertainty of the need for the proposed elementary school, the Plan recommends deferral of the park until the need for the school can be determined. If the school is not needed and a park is subsequently deemed necessary, the site should be transferred to the Park and Planning Commission for use as a local park. Quince Orchard Knolls is another undeveloped Board of Education site; it is being developed with recreational facilities.

Another project currently underway is the revitalization of the waterfront area at Seneca. This project includes provision of a new boat ramp, picnic area, snack bar, and bait and tackle shop.

The Park, Recreation and Open Space Master Plan (PROS) proposed that future Neighborhood Parks only be purchased in very urbanized areas where back yards are not large enough to meet small-scale recreational needs. The Plan, therefore, does not propose acquisition of any new Neighborhood Parks in the Darnestown Planning Area. This does not preclude future acceptance of dedications of this type of park by developers in certain instances.

Fire Station

The <u>Fire Station Master Plan</u>, adopted December 16, 1975, recommends that a fire station be located in the Darnestown area. The <u>Fire Station Master Plan</u> map, which delineates two- and four-mile coverage, indicates that a station located in the vicinity of the intersection of Route 28 and Seneca Road (Route 112) would fill the gap in the "western wedge." The Plan, therefore, recommends that a floating symbol for a fire station be located in this area. Because the staging of construction of a fire station depends heavily on other factors in addition to population density, it is impossible at this time to recommend when this station should be constructed. Currently, the number of calls for service in this portion of the Subregion would not justify construction of a station. The construction of the proposed Shady Grove Fire Station in the vicinity of Route 28 and Shady Grove Road, which is currently scheduled to be completed in FY 1984, will forestall the need for a Darnestown fire station in the near future. The Plan, therefore, recommends that this fire station not be programmed until a need can be demonstrated.

TRAVILAH PLANNING AREA (#25)

Residential Areas

The Plan recommends few zoning changes in Planning Area 25. The change involving the greatest land area is the "Pearson Farm" south of River Road and Stoney Creek Road. It is recommended that this parcel be reclassified to RE-2C. The "Residential Estate, 2 Acre" (RE-2) Zone does not have a cluster option available through the subdivision process as do other large-lot residential zones. Clustering is achieved through the use of the "Residential Estate, 2 Acre Clustered" (RE-2C) Zone. The purpose of this zone, as with cluster provisions in other zones, is to protect the character, natural terrain and vegetation of existing neighborhoods and to provide open space for common use. The RE-2C Zone allows for lots to be as small as 0.6 acre provided that the overall density be no greater than if all lots were two acres. Its use along the Potomac River is recommended to protect significant natural features which would otherwise be damaged by conventional subdivisions. This area along the river is characterized by very steep slopes. Development of this area, using conventional zoning, could have serious negative impact on the C & O National Park and on the river itself. The use of the cluster provision will allow the area to develop without disruption of the steep slope areas, preserve the natural waterways, and provide visual continuity with the C & O Canal National Park.

Cluster-type development can only be used if the land is proposed to be served by sewer and water. The effectiveness of this recommendation, therefore, depends heavily upon the availability of sewage capacity, particularly treatment capacity. If sewage capacity is not available, development must adhere to the conventional RE-2 development standards.

The residential development pattern in the Travilah Planning Area is expected to remain essentially the same as it is today. In addition to areas designated for two acre development, the Plan does recommend the use of the Planned Development Zone at a density of three dwelling units per acre (PD-3) in the relatively denser area in the northern part of the Planning Area, which is currently zoned "One Family Detached-Large Lot" (R-200) with a minimum lot size of 20,000 square feet. Again, it is recommended that the more dense development within this area be within one mile of Maryland Route 28 so as to be easily served by feeder buses when Metro becomes operational in this area.

The area is characterized by gently rolling land which is, or had been, cultivated fields. The area is traversed by several streams including Rich Branch and Piney Branch. The Plan therefore recommends that the land which is not developed in the PD-3 classification should be considered for development under the cluster option of the R-200 Zone. The cluster option will allow reasonable development of the area while encouraging preservation of the stream valleys and will retain much of the openness that characterizes this part of the Planning Area.

The Travilah Planning Area presents an opportunity for the provision of low- and moderate-income housing that is not present anywhere else in the Subregion. To the south of Maryland Route 28, immediately opposite the County Medical Center which is currently being developed, is a tract of approximately 50 acres called the Gudelsky Tract. This property was donated to the County for public use and as a suitable memorial to Isadore Gudelsky, but it appears that this land will not be needed either for the Public Services Training Academy or the Medical Center. The property might, however, appropriately be used for housing designed specifically to serve moderate-income public employees and employees of the Medical Center and Training Academy. If a housing project of this type can be developed on this tract, the property should be considered for a Planned Development (PD) Zone at a density of five to nine dwelling units per acre. The Planned Development Zone would allow a mix of housing types, the increased density necessary to make this kind of project feasible, and allow the construction of units at the periphery of the tract to be compatible with surrounding development.

Commercial Areas

Within the Travilah Planning Area there are 19.4 acres of land currently zoned for commercial use which contains 20,300 square feet of gross floor space. The economic analysis of the area indicates that 54,000 square feet of floor space for convenience goods is supportable now. This demand is projected to increase to 116,000 square feet by 2000. The Plan recommends that one local-commercial (C-1 Zone) shopping area of approximately seven acres be located within the Planning Area and that the total amount of commercially zoned land be decreased to approximately 16.8 acres (about 4.2 acres under roof, with the remainder for parking and landscaping).

The shopping area is recommended to be located at the southeast corner of Travilah Road and Route 28. The site was chosen because of its location with respect to the most dense zoning in the Planning Area and because it has access to both Route 28 and Travilah Road. The shopping area is recommended to be seven acres so as to allow construction of the most basic convenience outlets such as a grocery store and a drug store and limited to a size which would serve only the residents of a section of the Planning Area. The average floor area ratio (FAR)1 achieved in the C-1 Zone is about 0.25. A seven-acre shopping center will, therefore, produce about 76,000 square feet of floor space. A normal modern supermarket occupies approximately 35,000 to 40,000 square feet. The remaining floor space could be used for a drug store and/or several small specialty shops.

The Plan also recommends that an existing 3.4acre parcel of land now zoned C-1, which is located in the southwest quadrant of the intersection of Glen Road and Travilah Road, be rezoned to two-acre residential

Floor Area Ratio (FAR) equals the square feet of building space divided by the square feet of site. Because of the Zoning Ordinance requirement for off-street parking (one space per 100 square feet of retail sales), an FAR of greater than 0.25 is highly unlikely.

(RE-2). This property is now vacant except for the remains of an automobile service station still occupying the tract and a single-family dwelling which is also used as an office.

Industrial Areas

The only industrially-zoned land within the Planning Area is the Rockville Crushed Stone Quarry in the vicinity of Travilah and Piney Meetinghouse Roads. It has been estimated that there is enough rock within the quarry area for extraction to continue for the next 20 years and possibly for more than 50 years.

Along the northwestern boundary of the quarry, approximately 350 feet south of Travilah Road, lies a strip of land of approximately 25 acres currently in the R-200 Zone but which has traditionally been used for the storage of "spoils" piles generated by quarrying. The Plan recommends that this area be rezoned to the I-2 classification.

Public and Community Facilities

Schools

The Travilah Planning Area (#25) is now served by two elementary schools: Dufief and Travilah. The majority of senior high students are bussed to Thomas S. Wooton or Winston Churchill High Schools. Junior high students are transported to Robert Frost, Herbert Hoover or Cabin John Junior High Schools.

In the period up to 1985, elementary school enrollment is projected to increase by 140 pupils. Actual 1979 enrollment at Dufief Elementary School was 531 pupils and maximum capacity is 660. Enrollment at Travilah Elementary School was 351 in 1979, while actual capacity is 420. An additional 140 pupils would bring the total enrollment for the two schools to 1,320 or 60 pupils under the combined maximum capacity of the two schools.

The total capacity of the three junior high schools serving the Travilah Planning Area is 3,000 and the actual 1979 enrollment was 2,497. Junior high school enrollment is expected to decrease by about 630 pupils by 1985.

The present capacity for the two high schools serving the Travilah Planning Area is 3,570 pupils, while the actual 1979 enrollment was 3,793 or 223 pupils over capacity. Enrollment is projected to decrease by 540 pupils by 1985. This change in enrollment will leave the schools approximately 300 pupils below capacity by 1985.

Parks

The adopted FY 81-86 Capital Improvements Program contains several park projects which are located either wholly or partially within the Travilah Planning Area. The 11 acre Big Pines Local Park, which is located approximately 1.5 miles south of Route 28, has been acquired and development is scheduled for completion in FY 85. The developed four acre Dufief Local Park is programmed for expansion to a 14-acre site in FY 80. This site is located adjacent to Dufief Elementary School at Dufief Drive and Hall Lane, approximately one guarter mile south of Route 28. Additional development is scheduled for FY 82. The Tobytown Neighborhood Park is a 3-acre local use park located south of River Road and west of Pennyfield Lock Road within the Tobytown Renewal Project. This park is scheduled for development in FY 79 and FY 80. One other Local Park serving the area is the developed Glen Hills Local Park located along Piney Branch south of Glen Mill Road.

Because of the forecasted population growth within the Travilah Planning Area, the Plan recommends acquisition and development of one additional local park in the vicinity of Glen Road and Travilah Road. This proposed facility, called Greenbriar Local Park, is included in the adopted FY 81-86 Capital Improvements Program for acquisition beginning in FY 85.

The <u>PROS Plan</u> projects a need for eight additional ballfields for the Travilah Planning Area by 1985. In order to provide for these anticipated needs, the Plan recommends that ballfields be located at Big Pines Local Park, Dufief Local Park, the proposed Greenbriar Local Park and the proposed Glen Hills Elementary School site.

POTOMAC PLANNING AREA (#29)

Residential Areas

The Potomac Planning Area is the easternmost part of the Subregion; it is more fully developed than the other two and contains a variety of housing types. The major recommendations of the Plan provide for rezoning of some of the land between River Road and the Potomac River from the present RE-2 Zone to the RE-2C Zone and for removing the commercial designation recommended by previous plans for two properties; one in the vicinity of Falls Road and Victory Lane, and the other in the vicinity of Seven Locks Road and River Road. The Plan further recommends that these sites be developed in residential use to assist in meeting the affordable housing goals previously described.

Just under 50 percent of the total Planning Area is currently developed in residential uses. The largest numbers of dwelling units are located in the eastern and northern sections of the Planning Area. Development is dispersed throughout the area and the Plan recommends filling-in of the remaining vacant properties with residential development essentially similar to what is now there. Just as for the Travilah Planning Area, the use of the RE-2C Zone is recommended to allow scenic continuity between the C & O Canal National Park and the ultimate residential development, and to preserve some of the unique natural features in this area. The use of the RE-2C Zone in the Rock Run Drainage Basin is also recommended, primarily as a way to preserve some of the steep, wooded slopes and ravines plus the sensitive wildlife habitats which are found in that basin. The total area recommended to be rezoned to RE-2C is 1.220 acres.

As stated in the recommendations for rezoning in the Travilah Planning Area, the decision to use the cluster method of development depends upon the availability of sewage capacity and the inclusion of these areas into the water and sewer service "envelope." If development occurs by using septic systems prior to the availability of sewer and water, then lots would all probably need to be two acres or more as may be required by the County Department of Environmental Protection in order to ensure proper percolation of sewage effluent into the soil. Therefore, sewer service is critical to the use of the cluster method and the protection of natural features.

The Plan also recommends that a small area in the vicinity of Broad Green Drive be rezoned from RE-2 to R-200 (half acre lots). This strip of land was originally zoned RE-2 because it was adjacent to and within the

right-of-way for the then-proposed Democracy Boulevard Extension to an earlier alignment of the Outer Beltway. The eventual realignment of the proposed Outer Beltway further to the north and the proposed merging of Democracy Boulevard with Kentsdale Drive as described in the Transportation section of this Plan, eliminates the need for this strip. As with other parts of the Potomac Planning Area, the Plan recommends that the zoning line be moved so as to provide a tier of R-200 lots on both sides of Broad Green Drive.

Another area recommended for rezoning is the undeveloped land along Bells Mill Road between Falls Road and Great Arbor Drive. This area is to be changed from the current classification of RE-2 to RE-1 in order to affect a logical progression of densities from south to north. A single tier of half-acre lots in the R-200 Zone will be maintained on the south of Bells Mill Road.

In the Rock Run drainage basin the plan recommends that the 66.88 acre tract owned by Sheffield Enterprises, Inc., which is currently zoned RE-1 be rezoned to RE-2C. The tract, fronting on MacArthur Boulevard, is almost completely surrounded by land currently in the RE-2 classification although the land to the south across MacArthur Boulevard is in the R-200 classification, it includes only public uses, i.e., C & O Canal Park and the Navy's David Taylor Model Basin.

Approximately 1.6 acres of land are now zoned for local commercial (C-1) use at the intersection of Falls Road and MacArthur Boulevard. The property was acquired by the present owner in 1941. At that time, the deed allowed for commercial use on a portion of the property. The existing commercial zoning dates from 1953. It appears that this zoning was granted to allow continued use of the sale of produce from a roadside stand which was originally opened in 1948. Although several substantial offers to purchase the property were made over the intervening years, the owner kept the property as a roadside stand until 1977 when an agreement of sale of the property was signed. The contract purchaser intended to construct a small office building on the site and filed for a building permit. This permit was issued in December 1977 but was immediately challenged by residents of the area. Due to the time required for litigation, the building permit expired but was extended.

The courts finally ruled in favor of the applicant for the building permit. However, construction of the office building was not begun prior to the expiration of the building permit extension. When application was made for further extension of the building permit, the County Department of Environmental Protection ruled that no further extensions could be granted. This decision is currently being appealed by the original applicant.

The property is completely surrounded by residentially zoned land and parkland and is not an appropriate location for many of the uses allowed in the C-1 Zone. The size and location of the parcel is such that any commercial development would be virtually in the backyard of the existing residential development.

The Plan recommends that this parcel be rezoned to the R-200 classification. Because of the history of the property with regard to ownership, use, and zoning, however, certain special exception uses could be considered acceptable if suitable buffering were provided either on this property or the adjacent residential property under the same ownership. Some special exceptions which could be considered acceptable with proper site development, setbacks, and transitions are-roadside farm market, antique shops, child or elderly day care facilities, medical clinics, private educational institutions, nursing and care homes, or community swimming pool.

In the vicinity of the intersection of Falls Road and its intersection with Tuckerman Lane/Falls Chapel Way, the Plan recommends that approximately 40 acres of presently undeveloped land remain in the current R-200 classification but be designated as suitable for application of a Planned Development Zone at a density of three dwelling units per acre. A portion of this property has been recommended for commercial use in the previous master plan. Because of the proximity of this location to other shopping facilities in and near the northern portion of the planning area, the commercial designation was deemed no longer necessary.

Another area which previously had been recommended for a local commercial shopping center is in the northwest quadrant of the intersection of Seven Locks Road and River Road. Approximately two and one-half acres of a total of 1.5 acres is presently zoned for Local Commercial (C-1) use. The remainder of the property is in the R-200 classification but its topography is not readily adapted to such use. Approximately one and one-half acres of the site were acquired by Montgomery County in late 1979 to serve as the new location of Cabin John Fire Station 10 which is being moved from its present location at Seven Locks Road and MacArthur Boulevard. Again, because of the proximity of this site to existing and proposed commercial facilities, the commercial designation was deemed no longer necessary.

The Plan therefore recommends that the entire site be placed in the RT-10 zoning classification. The RT-10 Zone allows construction of single-family attached houses at a density of 10 dwelling units per acre.

Of special interest are the remaining undeveloped portions of the R-200 zoning district in this area, particularly those areas which abut the C & O Canal National Park. The area is heavily wooded with steep slopes in many areas and streams traverse many of the remaining undeveloped properties. The land to the south of Brickyard Road, while zoned R-200, was developed on septic stystems rather than public sewer, causing the lot sizes to be closer to one acre than the 20,000 square foot minimum lot size allowable in the R-200 Zone. Because of the unique natural features of this area, the Plan recommends that the property currently owned by the Girl Scouts of America, known as Camp Rockwood, be rezoned to RE-2-C and be designated as suitable for a Planned Development (PD) Zone at a density of two dwelling units per acre. The Plan also strongly recommends that the cluster method of development be used wherever possible on the remaining tracts of land. This method of development would allow many of the significant natural features to be saved and would also allow the provision of a visual buffer between the existing development and any new residential development which may occur there.

Industrial Areas

The land use plan recommends that the area bounded on the east by I-270, on the south by Montrose Road, on the west by Seven Locks Road, and on the north by the Rockville city line, be ultimately devoted to light industrial or office uses. This area is currently zoned R-200; however, it was recommended for industrial uses in both the 1964 General Plan and the City of Rockville Master Plan which was adopted in 1970. The area is contained within the "maximum expansion limits" of the City of Rockville, which means that the City would consider an eventual annexation. Current uses to the north of the property include a Montgomery County maintenance facility, the County Detention Center, and the Seven Locks Mini Mall shopping center. Existing zoning to the north of this property, within the City, is C-1 (Local Commercial) and I-3 (Restricted Industrial).

Earlier plans contemplated the use of Industrial Zoning; this Plan recommends that the I-3 (Industrial Park) Zone would be the most appropriate zone for this area. The "purpose" section of this zone states that the zone is to be used "... to reduce to a minimum the impact of industries on surrounding non-industrial uses.." This zone has very specific performance standards for uses within the zone including standards for vibration, noise, air pollution and odors. There is also a site plan review provision within the zone which would allow for provision of a buffer for adjacent residential areas.

It is the intent of this Plan that the higher, larger structures be placed to the north and east of the properties and the lower structures be placed to the south along Montrose Road and to the west along Seven Locks Road. Whenever possible, required open space should be placed in those areas closest to the existing residential uses. It is not recommended that this area be rezoned by sectional map amendment but that applications by the owners would be regarded favorably.

Also recommended for light-industrial or office uses is the area of land to the east of I-270 which is surrounded by the Rockville City boundary. This area is currently under County jurisdiction but is within the maximum expansion limits of the City.

Commercial Areas

The Master Plan does not recommend development of new shopping centers within the Potomac Planning Area. At present, the Planning Area contains two convenience-commercial centers--Potomac Village and Cabin John. Also, within the Planning Area is a regional shopping center--Montgomery Mall--containing many facilities which would also be found in a convenience shopping center. The Potomac Planning Area is also served by convenience and regional centers just outside of its boundaries. These include Rockshire. Seven Locks Plaza, Georgetown Square and Wildwood. An additional convenience-commercial center is also expected to be built south of the Planning Area at Seven Locks Road and MacArthur Boulevard. It is anticipated that these commercial areas will accommodate the shopping needs of this Planning Area.

The Plan also recommends an increase in the amount of commercially zoned land at the Cabin John Shopping Center at Seven Locks Road and Tuckerman Lane. Since the commercially zoned area at Potomac Village currently exceeds the 15-acre maximum allowed by the C-1 Zone, the Plan recommends that the amount of commercially zoned land not be increased at that location.

Montgomery Mall encompasses 60.78 acres of land and is zoned C-2 (General Commercial). This center satisfies some of the estimated convenience commercial demand. Immediately to the north of Montgomery Mall is a 28.86 acre tract of land recently rezoned for C-2 and which is currently being developed primarily as an auto sales park with the possibility of

several retail establishments.

Transition Areas

The Plan recommends that the 200-foot conservation strips along Rock Run (west of the commercial area) and along a tributary east of the commercial area, be maintained and strengthened.

Transition uses are also needed in the vicinity of Montgomery Mall on the south side of Democracy Boulevard. Montgomery Mall is a regional shopping center and is thus a relatively intense commercial area. Transitions have been achieved on three sides of this area, but land to the south is vacant and abuts singlefamily houses developed in the R-200 Zone. Considering the intensity of commercial development in the Mall and the density of the residential development immediately to the west of the Mall (which has occurred in the R-H, R-20, and R-30 Zones), it appears that one of the new RT Zones would be appropriate for this area to the south. Previous applications for the RT-12.5 Zone have been denied because that zone was considered to be too dense. It is, therefore, recommended that the area remain in the R-200 zoning classification, but that applications for the new RT-10 or RT-8 Zones would be considered to be in accord with the Plan.

Potomac Village

The major problems facing the Village today are the pressure for the spread of commercial zoning at the crossroads; the traffic management problems resulting from a poorly designed intersection; and the proliferation of driveways lacking traffic controls such as turn restrictions or directional restrictions. Actual 1977 peak-hour traffic counts show that the intersection should operate at Level-of-Service (LOS) B. This does not occur because of the number and frequency of turning movements which take place around the intersection.

The Plan recommends that a traffic management study be done as quickly as possible, not only to recommend changes to the intersection but to analyze the patterns of existing streets and driveways intersecting Falls and River Roads. Such a study should give particular emphasis to safe pedestrian passage to all quadrants of the intersection, as well as at the periphery of the commercial area. A system of traffic signals, timed to provide for a pedestrian walk cycle and to allow the intersection to be clear of turning movements both into and out of the commercial area, should go far toward alleviating this situation.

Design Concept

The Plan suggests that additional trees be planted in strategic locations throughout the commercial areas and beyond. Because of the narrow right-of-way owned by the SHA, this kind of planting scheme must necessarily be accomplished by the private sector.

The crossroads is the major focal point of Potomac Village due to topography and road alignments. This visual focus would be reinforced by preserving the Perry House and Store at the intersection (through adaptive-reuse and other programs) and through the planting of street trees and the construction of pedestrian pathways along the right-of-way. Further improvements would include pathways, signals, and construction at the intersection for improved pedestrian access.

Development of a pedestrian path linking the shopping centers ringing the crossroads is recommended



POTOMAC VILLAGE

EXISTING LAND USE







POTOMAC VILLAGE

EXISTING ZONING







POTOMAC VILLAGE

PROPOSED LAND USE







POTOMAC VILLAGE

PROPOSED ZONING



Zoning Boundary





DESIGN CONCEPT Pedestrian Crosswalks at Intersection Street Trees and Pedestrian Amenities along Major Roads Additional Parking Lot Landscaping

Preservation / Adaptive Reuse

Proposed Public Library

200-Foot Wide Conservation Area

to be accomplished in cooperation with the private sector. This pathway would connect with the paths to be built along the arterial roads. In conjunction with this pathway system would be additional landscaping in the parking lots to link visually to the "parkway" along the major roads. Map 23 suggests a design concept for Potomac Village.

Historic Sites

The Plan recommends that the Perry House and Store in the northwestern quadrant of the intersection be preserved, possibly as part of a Potomac Historic District. One of the buildings now houses Carrol Realty and Interiors by Edythe.

These structures are probably the only remaining ones which have ties to the true "old" Potomac. The Plan recommends that the kinds of uses which are now in the structures continue and that the structures be restored so as to approximate their original appearance as much as possible.

Public and Community Facilities

Schools

There are presently nine public elementary schools serving the Potomac Planning Area with a total maximum capacity of approximately 5,000 students. The capacity and enrollment of the schools are shown below:

The total 1979 enrollment in schools within the Potomac Planning Area was 3,653. The schools within the Planning Area are currently 542 students below capacity and enrollment in the Planning Area is expected to decrease by an additional 778 students by

School	Capacity		1979 Enrollment	
Belle Mill	390		465	369
Beverly Farms	540	_	640	452
Carderock Springs	325 .	-	390	267
Coldspring	490 -	-	590	502
Georgetown Hill	535 -	-	640	474
Lake Normandy	520 -	-	625	425
Potomac	470 .	-	565	490
Seven Locks	325 -	-	390	250
Wayside	600 .	-	720	424
TOTAL	4,195 .	-	5,025	3,653

1985. This situation could be eased somewhat by a small addition of students from the Travilah Planning Area; however, it appears that at least one additional school will have to be closed within the next eight to ten years despite continued growth in population.

The Plan recognizes the need for indoor recreation facilities within the Subregion. The projected decline in enrollment at public schools in the Subregion suggests, however, that these needs can be met by using schools which may be closed. The <u>Parks, Recreation</u> and <u>Open Space Master Plan</u> study of the long-term need for public indoor recreation is currently programmed. If this study should show that indoor space needs cannot be met by surplus schools, then consideration should be given to construction of an indoor facility which could be used in conjunction with an underutilized school. This would allow use of some of the surplus space within a school and also keep the cost of providing a new indoor facility to a minimum. The Potomac Planning Area contains two junior high schools--Cabin John and Herbert Hoover -with a total capacity of 2,080. The actual enrollment in 1979 was 1,636 students. This enrollment is projected to decrease by about 400 students by 1985, producing a total enrollment of 1,230 students. The Planning Area is also served by Winston Churchill High School with a capacity of 1,800 students. The actual 1979 enrollment was 1,880 students. Students within the Planning Area also attend Thomas W. Pyle and North Bethesda Junior High Schools, as well as Walter Johnson and Walt Whitman High Schools. All of these schools are currently under capacity and their enrollments are projected to decrease through 1985.

Throughout the Planning Area there appears to be no need for any new schools through 1985. Furthermore, a number of vacant properties, which were purchased in anticipation of future school needs are owned by Montgomery County Public Schools. The Plan proposes that three of these sites be transferred to The Maryland-National Capital Park and Planning Commission for use as local parks in order to meet recreational needs as identified in the <u>Park, Recreation and Open</u> <u>Space Master Plan</u>. Since these sites are now in public ownership, capital expenditure will not be required for acquisition.

Library

The Potomac Planning Area is served at present by a store-front library operating in rental space on Falls Road. This facility is inadequate to meet the needs of the Subregion. The adopted <u>Capital Improvements Program FY 81-86</u> contains a project for constructing a permanent 15,000 square foot library on the east side of Falls Road immediately to the north of Glenolden Drive. The facility will have approximately 15,000 square feet of floor space to house 65,000 books, reading areas with chairs for 200 persons, a meeting room for 100 persons and a parking lot for 100 vehicles. The new library facility is currently programmed for completion in FY 85.

Fire Station

The Fire Station Master Plan, adopted in January 1976, recommended relocation of the Cabin John Fire Station (Fire Station #10). This station is currently located on MacArthur Boulevard and Seven Locks Road to the east of the Planning Area. The existing facility was built in the late 1930's and a wing was added to the building in the 1960's. The structure occupies the entire site which inhibits any expansion of the building necessary to handle efficiently the fire and rescue functions which have become associated with the station in recent years. To maintain even the present levels of service, continued use of the existing structure would require repairs and modernization, including the installation of a new central heating system. The primary reason that the Fire Station Master Plan recommended relocation, however, is the fact that the location of the existing facility so close to the Potomac River restricts its service area to 180° coverage around the station, rather than the normal 360° coverage. Because of this, a disproportionate amount of the service area for Station 10 is to the north and west of the station and is beyond the five minute First Due Response Time criteria established by the County.

To correct these deficiencies, the <u>Fire Station</u> <u>Master Plan</u> recommends that the station be located in the vicinity of River Road and the Capital Beltway (I-495). Based upon a study of several alternative sites, the County Executive selected one on the north side of River Road about 1,000 feet west of the Seven Locks Road intersection. The new facility will house a minimum of two pumpers and one ambulance in a structure of approximately 10,500 square feet. The entire facility will occupy approximately 1% acres. The relocation is included in the adopted Capital Improvements Program - FY 81 to FY 86, for construction in FY 81 and 82.

Parks and Recreation

The Master Plan recommends several park projects to be developed within the Potomac Planning Area. These include three Neighborhood Parks--Lake Normandy, Highland Stone, and Scotland; three Local Parks--Kentsdale, Falls Road, and Persimmon Tree; additions to the Stream Valley Park system--Bucks Branch, Kilgour Branch, and Cabin John; and an addition to the Cabin John Regional Park.

There are four Stream Valley Parks within the Planning Area. Approximately 230 of the ultimate 336 acres have been acquired in the Watts Branch Stream Valley Park, with the remainder scheduled to be acquired by FY 81. Over half of the ultimate 84 acres of proposed parkland along Kilgour Branch, a tributary of Watts, has been acquired. Acquisition will not be completed until after 1986, however. In the Cabin John Stream Valley Park, approximatley 75 percent of the proposed 571 acres within the Planning Area have been acquired. Approximately 99 percent of the ultimate 115 acres proposed for the Bucks Branch Stream Valley Park have been acquired.

In addition to these Stream Valley Parks currently being acquired, this Plan recommends that a Stream Valley Park be acquired along Rock Run in the southern part of the Planning Area. This park would include 239 acres and would be located northeast of Brickyard Road and MacArthur Boulevard. Rock Run is one of the cleanest streams in the County and the proposed park would be a conservation park. The Stream Valley Park would encompass a small waterfall and a historic goldmine. The Rock Run Stream Valley Park would be augmented by the open space buffer for the wastewater treatment plan proposed for the abutting Avenal farm. The buffer is expected to be about 450 acres.

The Potomac Planning Area contains the only Regional Park within the Subregion--Cabin John Regional Park. This 551 acre park has a wide range of recreational facilities including ballfields, tennis courts, playground areas, an "Old Mac Donald's Farm," a miniature train, an ice skating rink, and large-scale picnic areas. The remainder of the park is devoted to conservation-oriented uses.

There are now six developed Neighborhood Parks in the Planning Area:

- * Bedfordshire
- Fox Hills West
- * Tuckerman
- South Potomac
- ' Bucks Branch
- ' Scotland

Another Neighborhood Park, Highland Stone, has been acquired and is proposed for development in FY 80. As in the other Planning Areas within the Subregion, the Plan does not propose acquisition of any new Neighborhood Parks, in accordance with the recommendations of the <u>Park</u>, <u>Recreation and Open Space Master Plan</u> (PROS).

The PROS plan indicated a very high team sport participation rate within the Subregion and a correspondingly high need for ballfields--the Plan projects a need for seven fields within the Planning Area by 1985. The Subregion is very deficient in Local Parks which provide for these needs, having only Beverly Farms Local Park. The Plan recommends that the Falls Road Junior High School site at Falls Road and Falls Chapel Way be transferred to the Park and Planning Commission for use as a Local Park. The Plan further recommends that the currently programmed Persimmon Tree Local Park be located on the surplussed Potomac High School site at Persimmon Tree Road and Bradley Boulevard. An alternate location for this park would be on property to be acquired for the Rock Run Sewage Treatment plant on the Avenel Farm if topography is suitable.

The Kentsdale Local Park should be located on the site acquired for Bradley Junior High School on Logan Drive north of River Road. The Plan further recommends that the Bradley Junior High School site be considered for a public facility area if surplussed by the Board of Education. The projected need for ballfields can be met as follows:

Name of Park	Number of Fields
Kentsdale	1
Falls Road	3
Persimmon Tree	3
TOTAL	7

Community/Recreation Center

A recreation center has been requested by residents of the Potomac and Travilah Planning Areas to provide needed indoor recreation space. This need is especially critical for day-time facilities, as this area does not have any of the small recreation buildings that are included in many older, down-County parks. Indoor space needs are currently being met only by the "Community Schools" program. In view of declining school enrollments in the area, it appears that efforts to provide indoor facilities should concentrate on the possible use of schools which will be closed.

If further analysis through the Indoor Recreation Needs study shows that indoor space needs cannot be met by these facilities, consideration should be given to the construction of a recreation center in conjunction with a school which will remain in use. This would allow use of classroom space which would otherwise be underutilized due to declining enrollment and would minimize the cost of constructing a recreation center. Schools where it appears to be feasible to construct such a facility would include Lake Normandy and Beverly Farms.







IMPLEMENTATION

SUMMARY

The primary mechanisms for implementing the Plan are through the "Ten Year Water and Sewer Plan," by adoption of the recommended <u>Zoning Ordinance</u> map changes and by including the recommended public facilities in the Capital Improvements Program.

Priorities for granting of sewage treatment capacity are summarized as follows:

- Stage I Sewer Service Category 3. The property currently owned by the Girl Scouts of America (Camp Rock-wood). All undeveloped areas zoned R-200 (half-acre) with the exception of the area bounded by Maryland Route 28, Turkey Foot Road and Jones Lane and the area on the north side of Maryland Route 28 at Seneca Road, which is recommended to retain the R-200 classification. Two other excepted areas are noted below for Stage II.
- Stage II Sewer Service Category 5. The Rock Run Drainage Basin. The two R-200 areas which drain by gravity to Piney and Sandy Branches.
- Stage III Sewer Service Category 5. The area between River Road and the Potomac River from Blockhouse Point Park to Persimmon Tree Road.

Stage IV - Those areas which can logically and economically be served by the transmission network extensions from all of the above areas.

WATER AND SEWER FACILITIES

Historical Perspective

The area covered by the Potomac Subregional Master Plan has a long and complex history regarding the provision of public water and sewer. In order to fully understand the present policies guiding water and sewer service, it is essential to understand the underlying philosophy and actions of past Montgomery County Councils and the Washington Suburban Sanitary Commission.

In the 1960's, growth moved out in a north and west direction from the more urbanized areas of Bethesda and Rockville. The provision of public water and sewer was one of the major infrastructural elements necessary to support this increasing growth. At the time, the WSSC viewed its role as supporting the County's land use plans by construction of the sanitary facilities required to sustain the development anywhere it happened to occur. In order to provide public service to the areas approved for development, the WSSC constructed large trunk sewers in the Muddy, Watts and parts of the Rock Run Basin. Once the trunk lines were constructed, sewer and water service could be provided to all areas requesting public service within those basins.

The onset of the 70's brought changes in Montgomery County's water and sewer policy. The philosophy changed from one of supporting continued unlimited expansion of public water and sewer service, to the withdrawal of service in the major portions of the Muddy, Watts and Rock Run Basin. Specifically, in 1971, the Montgomery County Council, through their regulatory authority in the Ten Year Water and Sewer Plan, designated certain areas in these basins as ineligible for water and sewer service. For this reason, these basins are laced with water and sewer trunks, but mains and lateral service are not available to development unless a public health problem is identified by the County's Department of Environmental Protection, or whenever the County Council finds other compelling reasons to exempt specific properties from the general withholding of service to an area.

Existing Water and Sewer Policies

Sanitation facilities are provided either by individual on-site disposal (septic system with either well or public water) or by public water and sewer service. Generally, areas with two acre zoning are developed on individual septic systems; areas having half to one acre zoning are developed with both public water and sewer service. There is no strict policy regarding zoning and provision of public water and sewer except in the Rural Zone (5 acres) where public water and sewer is not provided.

To secure public sewer service, four separate conditions must be met before sewer service is assigned:

- Property must be in an eligible sewer category designation on the County's Ten Year Sewer and Water Plan.
- 2. Treatment capacity must be available.

- 3. There should be no transmission constraint in the system.
- An engineering report by WSSC must show that it is cost-effective to service the property.

Presently the County is entitled to only limited treatment capacity at the regional treatment plant at Blue Plains. To meet future needs a site has been selected in the lower Rock Run Basin for a 20 mgd advanced wastewater treatment facility. This facility is planned to provide supplementary capacity for the Blue Plains service area in Montgomery County. The facility is planned to be operational in the 1980's.

All property in Montgomery County is designated in one of six sewer categories In sewer categories 1 to 3, a property is eligible to apply for sewer service. Categories 4 through 6 are not eligible for service even if existing sewer lines traverse the property (except in the case of identified public health problems). Sewer categories and category changes are considered semiannually by the County Council as amendments to the County's Ten Year Water Supply and Sewerage System Plan. Those areas which are currently in Sewer Service Category 6 are shown on the Environmental Resources Map (No. 27).

Once a property is designated in a sewer category 1, 2, or 3, application can be made to the WSSC to secure a sewer allocation. If treatment capacity is available a sewer allocation is granted. Specific sewer capacity available to the Potomac planning area cannot be calculated since all sewer capacity is considered County-wide and is dependent upon the geographical distribution of sewer service request.

STAGING PROGRAM

The implementation and staging recommendations contained in the Plan are based on the following factors:

- 1. The major roads which serve the Subregion have limited transportation capacity at present.
- Sewage treatment capacity to serve the Subregion is a primary limiting factor within the master plan period (0-10 years).
- 3. The only realistically available staging mechanisms are the provision of sewer service and the improvement of street capacity.
- 4. It is County policy to provide "moderately priced dwelling units" (MPDU's) in the Subregion, as well as in all other areas of the County which are zoned for half acre or more dense zoning. However, MPDU's are not required in areas which are not within the ten year water and sewer envelope.
- Much of the area currently zoned RE-2 can be developed on septic and well systems at densities comparable to or only slightly reduced from the two acre zoning standard.

Based on the above, the Plan recommends that the highest priority for development be granted in those areas recommended for R-200 zoning. If the R-200 areas are inhibited from development because of a lack of sewer allocations, the areawide general transportation capacity that is currently available will eventually be used up by other development which would occur in the RE-2 (Residential Estate - 2 acre) zoned areas. Eventually, the following adverse conditions would result:

- Few, if any, MPDU's will be constructed in the Subregion until sewer capacity becomes generally available and additional transportation capacity is provided. Since the deficiency of transportation capacity occurs primarily on State highways, such as River Road and Route 28, the implementation of County housing policy in the Potomac Subregion depends indirectly on the State's ability to finance new highway construction.
- The number of vehicle miles of travel for all trip making purposes increases.
- Continued dispersion of potential elementary and secondary students will increase the length of school bus trips.
- 4. Development of the two acre areas on septic systems can result in development patterns which are not ecologically sound or environmentally sensitive in terms of preserving unique natural features and open space.

By encouraging early development of the R-200 areas by making sewage treatment capacity available, the new growth will be be better matched to the available transportation capacity. Later occurring, low-density sprawl-type development could then be retarded through the use of the adequate public facilities ordinance if improvements to road capacity are not made. Under the County's Adequate Public
Facility Ordinance, when the available transportation capacity has been exhausted, additional subdivisions which can be shown to overtax the highway network, whether on sewer or septic, cannot be approved until additional highway capacity becomes available. First priority for sewer service (Category 1-3) should be given to areas within the R-200 zoning category.

The approximately 5,280 acres of undeveloped land in the R-200 classification could produce a maximum of 12,672 new dwelling units if allowed to develop and the density bonus for MPDU's is applied.

The second and third priority areas to receive sewer service, respectively, should be the Rock Run Drainage Basin and those two-acre areas between River Road and the Potomac River. The Plan recommends that these areas be placed in sewer and water service category five. This places these areas within the sewer envelope but at the end of the 7 to 10 year period.

The final stage for the expansion of the sewer envelope would be those two-acre areas which can logically and economically be served by extensions from, or which can tie in with the transmission system as extended during the previous stages. Since there are no programmed dates for the provision of additional treatment capacity, it is impossible at this time to recommend dates for the beginning of each stage. With the exception of the Stage I recommendations, which would begin immediately, the other two stages must be tied to the provision of sewage treatment capacity and highway capacity. Depending upon how additional capacity is provided some refinements of the staging elements may be desireable in future years, but within the general policies recommended above. The Plan does not contemplate extension of sewer and/or water to all of the areas recommended for two acre (RE-2) zoning, particularly those two acre areas immediately adjacent to the Rural Zone areas. If the transmission system extensions to serve a given area cannot be constructed economically, then that area should be allowed to develop on well and septic systems.

ZONING

The Master Plan recommends that all proposed zoning changes, with minor exceptions, be implemented through comprehensive rezoning (Sectional Map Amendment). This will ensure that the proper zoning is available when it is needed, either to allow construction of necessary facilities, or to forestall applications for local map amendments which could produce inappropriate development. Rezoning by Sectional Map Amendment is not recommended for those areas which are suitable for the RT Zones, but which would require at least a preliminary design study to determine the exact location of the appropriate zoning line. Other exceptions are the areas recommended for the I-3 zone (Industrial Park).

CAPITAL IMPROVEMENTS PROGRAM

The Master Plan recommends that several additional projects be programmed if the orderly development of the Subregion is to continue. These are primarily transportation projects which are necessary to provide needed highway capacity. Implied within the recommendations of the Master Plan, but not specifically recommended for programming, are those sewer projects needed to provide both transmission capacity and treatment capacity. These facilities are and should be programmed through the "Ten Year Water and Sewer Plan."

Other projects are recommended for programming which are necessary to maintain or improve existing levels of service, such as the proposed Potomac Library and parks.

TABLE XIII

POTOMAC SUBREGION ADOPTED CAPITAL IMPROVEMENTS PROGRAM FY 81-86

Item	Funded By	Amount (\$000)	Fiscal Year Completion Date
Transportation			
Democracy Boulevard Extension -			
Gainsborough Road to Kentsdale Drive	County	1.922	85
Montrose Road Extension -		- ,	
Seven Locks Road to Falls Road	County	534	beyond six years
Seven Locks Road - Mac Arthur to Greentwig	County	2.011	
Seven Locks Road - Bradley Boulevard to Montrose Road	County	773	83
Parks and Recreation			
Big Pines Local Park	M-NCPPC	298	85
Darnestown Local Park	M-NCPPC	298	82
Dufief Local Park	M-NCPPC	190	82
Falls Road Local Park	M-NCPPC	230	81
Greenbriar Local Park	M-NCPPC	21.5	beyond six years
Highland Stone Neighborhood Park	M-NCPPC	93	80
Lake Normandy Estates Neighborhood Park	M-NCPPC	178	83
Ouince Orchard Knolls Local Park	M-NCPPC	80	80
Tobytown Neighborhood Park	M-NCPPC	100	80
Kilgour Branch Stream Valley Park	M-NCPPC	168	86
Muddy Branch Stream Valley Park, Unit 1	M-NCPPC	1,167	beyond six years
Muddy Branch Stream Valley Park, Unit 2	M-NCPPC	397	beyond six years
Muddy Branch Stream Valley Park, Unit 3	M-NCPPC	301	beyond six years
Rock Run Stream Valley Park	M-NCPPC	*	85
Watts Branch Stream Valley Park, Unit 1	M-NCPPC	505*	beyond six years
Watts Branch Stream Valley Park, Unit 2	M-NCPPC	766	beyond six years
Watts Branch Stream Valley Park, Unit 4	M-NCPPC	40*	beyond six years

TABLE XIII (Cont'd.)

Item	Funded By	Amount (\$000)	Fiscal Year Completion Date	
Other Facilities				
Darnestown Elementary School - Modernization	Public Schools	1.068	81	
Herbert Hoover Junior High - Modernization	Public Schools	1,527	beyond six years	
Travilab Elementary School - Modernization	Public Schools	1,277	beyond six years	
Cabin John Fire Station #10 Relocation	County	1,662	87	
Potomac Library	County	1,884	85	
Utilities				
Cabin John Relief Sewer	WSSC	6,439	82	
Rock Run Sewage Treatment Plant	WSSC	69,361	86	
Watts Branch Stormwater Management	County	10		
Totals				
County		6,340		
WSSC		75,800		
Public Schools		3,872		
M-NCPPC		5,112*		
GRAND TOTAL COUNTY AGENCIES		91,124*		

* Excludes land acquisition costs.

TABLE XIV

POTOMAC SUBREGION PROPOSED CAPITAL IMPROVEMENTS PROGRAM

Item	Funded By	Amount (\$000)	Completion 19
Transportation			
Falls Road (MD 189) - Ritchie Parkway to Falls Bridge Lane	State	8,300	
City of Rockville Line Seven Locks Road, Tuckerman Lane to	State	33,563	
Montrose Road	County	2,612	
Parks			
Glen Hills Community Park Kentsdale Local Park Persimmon Tree Local Park	M-NCPPC M-NCPPC M-NCPPC	66 205 335	82 85 84
Other Facilities			
Darnestown Fire Station	County	-	beyond six years
County WSSC M-NCPPC State		2,612 606* 41,863	
GRAND TOTAL		45,081	

* Excludes land acquisition costs.

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	RE-1 Residential Estate 1 Acre	RE-2 Residential Estate 2 Acre	RE-2C Residential Estate 2 Acre,Cluster	RURAL Residential Estate 5 Acre	R-200 One Family Detached	R-150 One Family Controlled Density	R-90 OneFamilyDetached RestrictedResidentia
	R-30/R-20 Multiple Family	RH Multiple Family High-Rise	RT TownHouse	C-1 Local Commercial	C - 2 GeneralCommercial	I-2 Heavy Industrial	



CERTIFICATE OF APPROVAL AND ADOPTION

This Master Plan for the Potomac Subregion, being an amendment to the General Plan for the Physical Development of the Maryland-Washington Regional District in Montgomery County, Maryland, and to the Master Plan of Highways within Montgomery County, Maryland has been approved by the Montgomery County Council, sitting as the District Council, by Resolution 9-723 on April 15, 1980 and has been adopted by The Maryland-National Capital Park and Planning Commission by Resolution 80-12 on May 14, 1980 after a duly advertised public hearing pursuant to Article 66D of the Annotated Code of Maryland, 1976 Supplement.

John B. Burcham, Jr., Chairman Royce Harson, Vice Chairm a. Edward Mararre A. Edward Navarre, Secretary-Treasurer

MASTER PLAN FOR THE POTOMAC

LAND USE PLAN Single Family Detached Townhouses

Multiple Family

SUBREGION

MAY 14, 1980

THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

MONTGOMERY COUNTY PLANNING BOARD







CAPITAL BELTWAY

POTOMAC

