COMPREHENSIVE PLAN FOR PRINCE WILLIAM COUNTY, VIRGINIA

A FRAMEWORK FOR ACTION 1973-1978

SECTION I WHERE ARE WE NOW?

A part of the comprehensive plan for the physical development within the jurisdiction of Prince William County, pursuant to the provisions of Title 15.1, Chapter II, Article 4, the laws of the Commonwealth of Virginia.

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March 6, 1973

Mr. L. J. Dukes, Chairman
Prince William County Planning Commission
15920 Jefferson Davis Highway
Woodbridge, Virginia 22191

Dear Mr. Dukes:

I am pleased to transmit to the Planning Commission and to the citizens of Prince William County Part I of the Comprehensive Plan for Prince William County.

Entitled "Where Are We Now?", Part I has been prepared to assist in the formulation of the plan by providing background information necessary for a basic understanding of the status of physical development in the County. Part II of the Comprehensive Plan, entitled "Where Are We Going?", will be completed following a period during which comments and recommendations from the citizens will be sought.

It is hoped that this document will help to establish an ongoing comprehensive planning process, strongly linked to implementation measures. This planning process should anticipate and achieve changes in the County that are consistent with the County's needs, goals and resources. Greater recognition of and support for the planning process is needed, especially among the citizens of Prince William County, who must bear the consequences of ineffective planning, and who will benefit most from effective planning.

Respectfully submitted,

Henry G. Bibber

Henry G. Bibber
Director of Planning

HGB/sah

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INTRODUCTION

Functions of the Comprehensive Plan

This comprehensive plan for Prince William County is designed to be a functional and useful document. Once it is adopted, following public hearings, debate and modification, it should serve the following functions:

Framework for Decision Making

County citizens and officials need an instrument which establishes general goals and policies for the physical development of the County. These policies should be consistent, coordinated and relevant so that they may be referred to continually in decisions on development in the County.

Basis for Guiding Development

This plan provides a general picture of present development in the County and a set of proposals for guiding future development that is consistent with the County's needs. Although it does not indicate specific locations for specific uses, this plan does delineate areas where growth will be accomodated, the population growth that can be accomodated and what type of development will be encouraged over the next five-year period. It also proposes policies and programs designed to bring about these desired growth patterns.

Basis for More Detailed Plans and Programs that Require Comprehensive Planning

When adopted, this plan will be the County's first adopted comprehensive plan. It should serve as the basis for more detailed planning and identify areas in which further planning is immediately needed. It should make possible those programs which require a comprehensive plan as a prerequisite, and it should provide the basis for improved development ordinances and policies that depend upon the presence of an adopted plan.

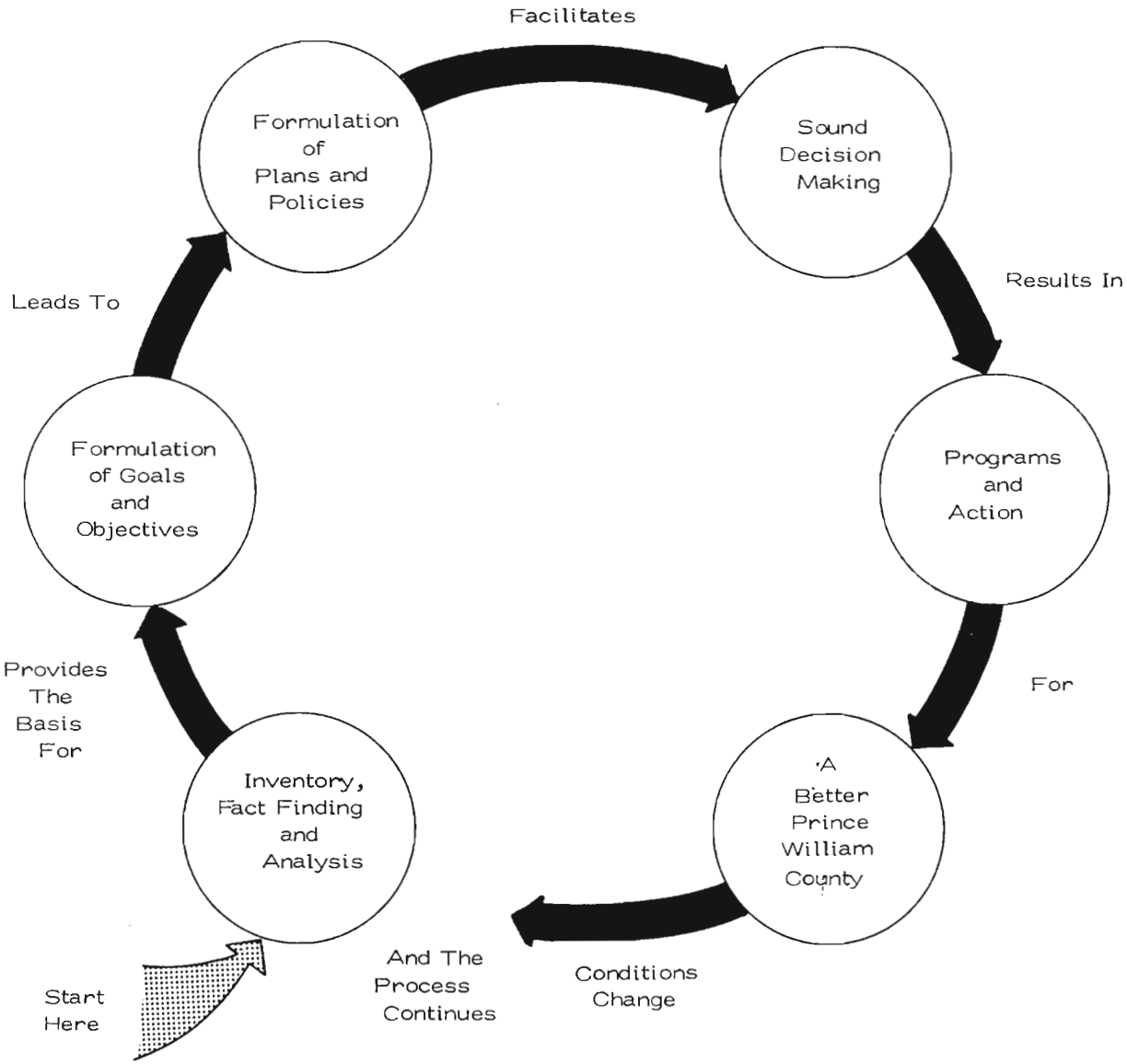
Means of Education

County officials and citizens should find the plan useful in gaining an understanding of the County's present state of development. The plan should increase general awareness of planning and development issues among County citizens and improve the citizen's ability to influence the future directions of the County through greater participation in the planning process.

Means of Communication

The plan serves as a communication vehicle through which the Board of Supervisors can present a unified picture of its general policies on development to persons in and out of the County concerned with development and growth.

The continuous planning process is a major element in sound decision making and action.



WHERE ARE WE NOW?

Location and History

Prince William County is located in northeastern Virginia, approximately thirty miles southwest of the District of Columbia. It is bordered by Fairfax, Loudoun, Fauquier, and Stafford Counties and the Potomac River. The County has an area of 345 square miles, including areas covered by water. It is elongated in shape, being approximately 36 miles long and 12 miles wide.

The terrain of Prince William County is interesting: gently rolling in most areas, hilly in the eastern and southern portions, and relatively flat in the central portion. It extends from Tidewater to the Bull Run Mountains and includes the Piedmont region. The drainage is all into the Potomac River, with the Occoquan Creek having the largest drainage basin. This creek is the source of water supply for the Alexandria Water Company serving the eastern and most densely populated portion of the County, as well as Alexandria and parts of Fairfax County.

OUR HERITAGE

Historically, the County began its separate existence in 1731, when it was partitioned from King George and Stafford Counties. It was named for William Augustus, Duke of Cumberland, the youngest son of George II. Originally, the County was a very large County, over 2000 square miles in area, embracing the territory which now makes up Fauquier, Loudoun, Fairfax and Arlington Counties. The following year the first Courthouse was established on the Occoquan Creek. Eastern Prince William developed into a fishing, cotton, and tobacco trade center and served as a travel route to other settlements. In the Occoquan area an iron works factory was founded.

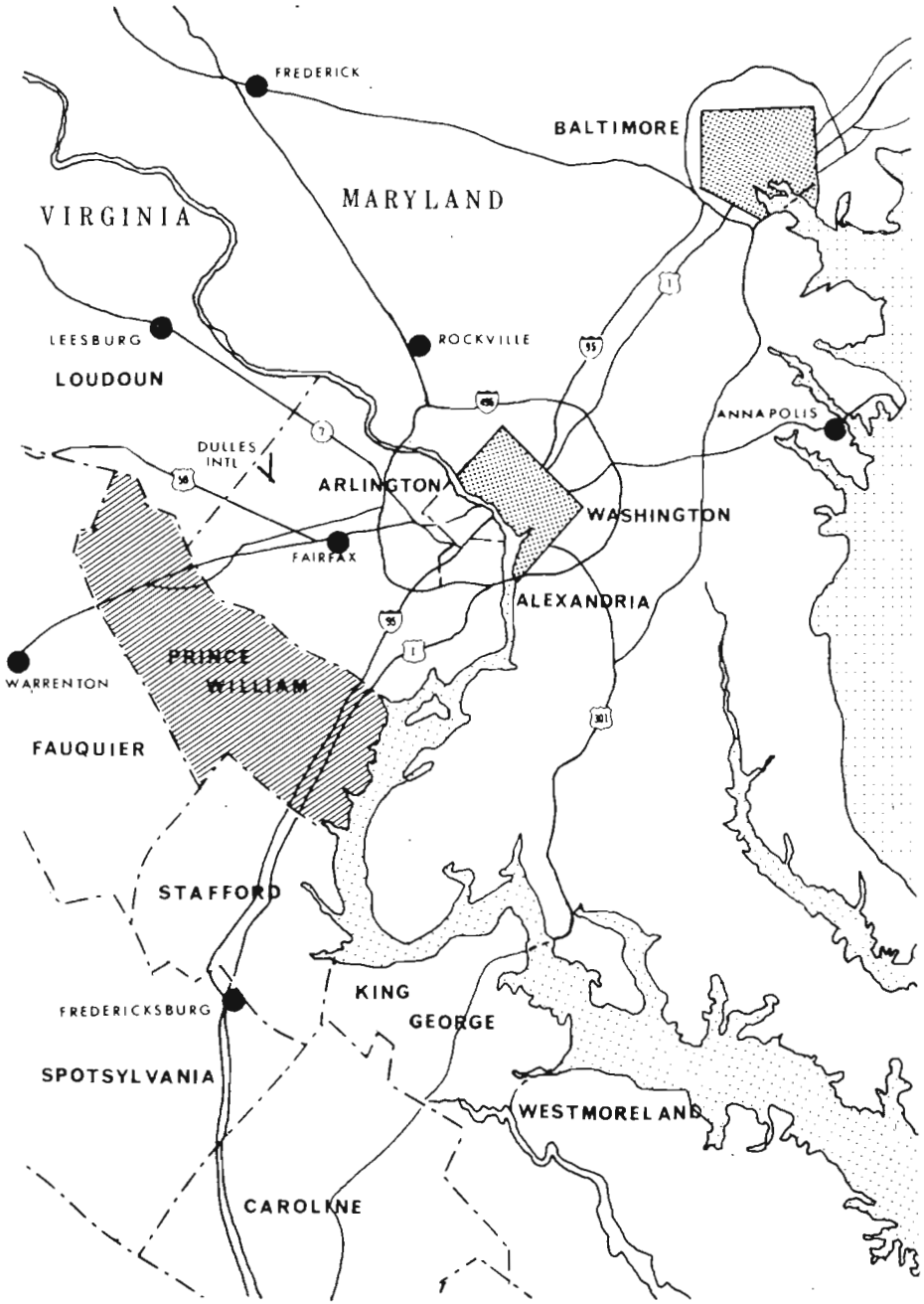
Separation of land from Prince William occurred during the period of 1742-1759 when the present boundaries of the County were formed. During this time the Courthouse was moved to Cedar Run and in 1761 it was moved to Dumfries because of the changing county boundaries and the thriving trade which had brought a large population into that area. Dumfries was developing into a major eastern seaport. However, silting began to block boat maneuvering along the tributaries of the Potomac; thereafter, trade diminished and population decreased.

By 1774 the talk of revolution against the Mother Country was gaining momentum, and the people of Prince William County formed Virginia's first company of Minutemen. War followed. During the course one of Prince William's citizens General Henry Lee (nicknamed "Light-Horse Harry Lee" and father of Robert E. Lee) became one of the Army's most distinguished officers. The settlement of lands in the western portion of Prince William resulted in the Courthouse being moved to Brentsville in 1822.

Once again the Country engaged in war in which Prince William played a part. The junction of Manassas Gap Railroad and the Orange and Alexandria lines was a strategic spot in the Civil War. In July, 1861, this area was the site of the first major battle of the Civil War. Thirteen months later a second battle was fought on the same land. Following the war the people of Prince William had the slow and difficult task of rebuilding a county that had been laid waste by the destruction of war.

By 1873 the Town of Manassas was incorporated and the expanding population of this area was eager to acquire the County Seat. Twenty years later the establishment of the present-day Courthouse in Manassas was accomplished. By 1917 the establishment of the United States Marine Corps Base at Quantico resulted in an increase in the economy and population of the eastern section of the County. In the western portion, travelers and tourists were attracted into the area to visit the historic battlefields. For many years the County was almost wholly dependent upon lumber, fishing and agriculture and its population growth was quite slow.

Because of its proximity to the Nation's Capital, it was inevitable that Prince William County would be influenced by the expansion of the federal government. Between 1950 and 1960, Prince William County began to experience development related to the Washington Metropolitan Area. During that decade, its population increased by 121%, from 22,612 persons in 1950 to 50,164 persons in 1960. By 1970, the population had again more than doubled, to 111,102 persons. By the middle of 1973, its population will probably exceed 135,000 persons.



Regional and State Setting

Prince William County is part of the Washington, D.C. Metropolitan Area. The County's rapid growth over the past twenty years is largely attributable to this fact. The County has had very little influence over a number of the factors that have contributed to its present condition as a growing suburban area of metropolitan Washington. These factors include the construction of I-95 and I-66, growth of employment in the Washington area and immigration to the metropolitan area from all parts of the country. Recognition of the County's regional setting is necessary in order to deal effectively and realistically with the external factors that affect community growth and change.

The County is a member of several regional agencies which carry out planning activities that significantly affect Prince William County. These include the Washington Metropolitan Council of Governments and the Northern Virginia Planning District Commission. These agencies have professional planning staffs which are developing regional plans in several functional areas, such as transportation, water and sewer services, land use, open space and housing. They also gather and analyze information on many subject areas. They review all projects for which Federal funds are requested in the County and they serve as a forum for debating and resolving regional problems.

Each of these regional agencies has a policy-making board composed of representatives of local jurisdictions in the region. These boards may adopt the plans prepared by the professional staffs, which usually work closely with local planners and other officials such as those in Prince William County.

Regional planning and cooperation, (in which Prince William County and its neighboring jurisdictions take an active part,) are necessary in order to deal efficiently with problems that have regional impact. Major urban planning decisions in any jurisdiction usually have an impact upon neighboring jurisdictions. Regional planning fosters cooperation among jurisdictions and provides for regional solutions to problems that transcend local political boundaries. Prince William County must have a viable planning program of its own in order to take full advantage of its membership in these regional agencies, to deal efficiently with neighboring jurisdictions, and to prevent the erosion of its planning prerogatives within its own boundaries.

The plans adopted by the regional agencies are often policy plans, in that they set goals and policies for the region rather than establish specific development criteria within each jurisdiction. Plans are also developed which are required by state or federal agencies as prerequisites to funding of further planning or funding of community facilities or utilities, such as sewage treatment plants in Prince William County.

THE STATE

State legislation determines the powers of local governments in the field of planning and community development and establishes state-wide programs in this field. The needs of Prince William County must be met within the context of state legislation and state programs. A sound planning program in Prince William County is necessary in order to take advantage of state programs and to enable the County's representatives to argue effectively for appropriate state action in all matters relating to planning and community development.

Prince William County is one of ninety-six Counties in the Commonwealth of Virginia. The various agencies of state government play an important role in planning and development within the County. The Virginia Department of Highways is responsible for all public streets and roads. The State Water Control Board and State Department of Public Health impose requirements for water quality management, sewage treatment and environmental health. The Division of State Planning and Community Affairs establishes criteria for Federal planning assistance funds and is moving into the area of environmental protection.

SOILS

SUITABILITY FOR SEPTIC SYSTEMS

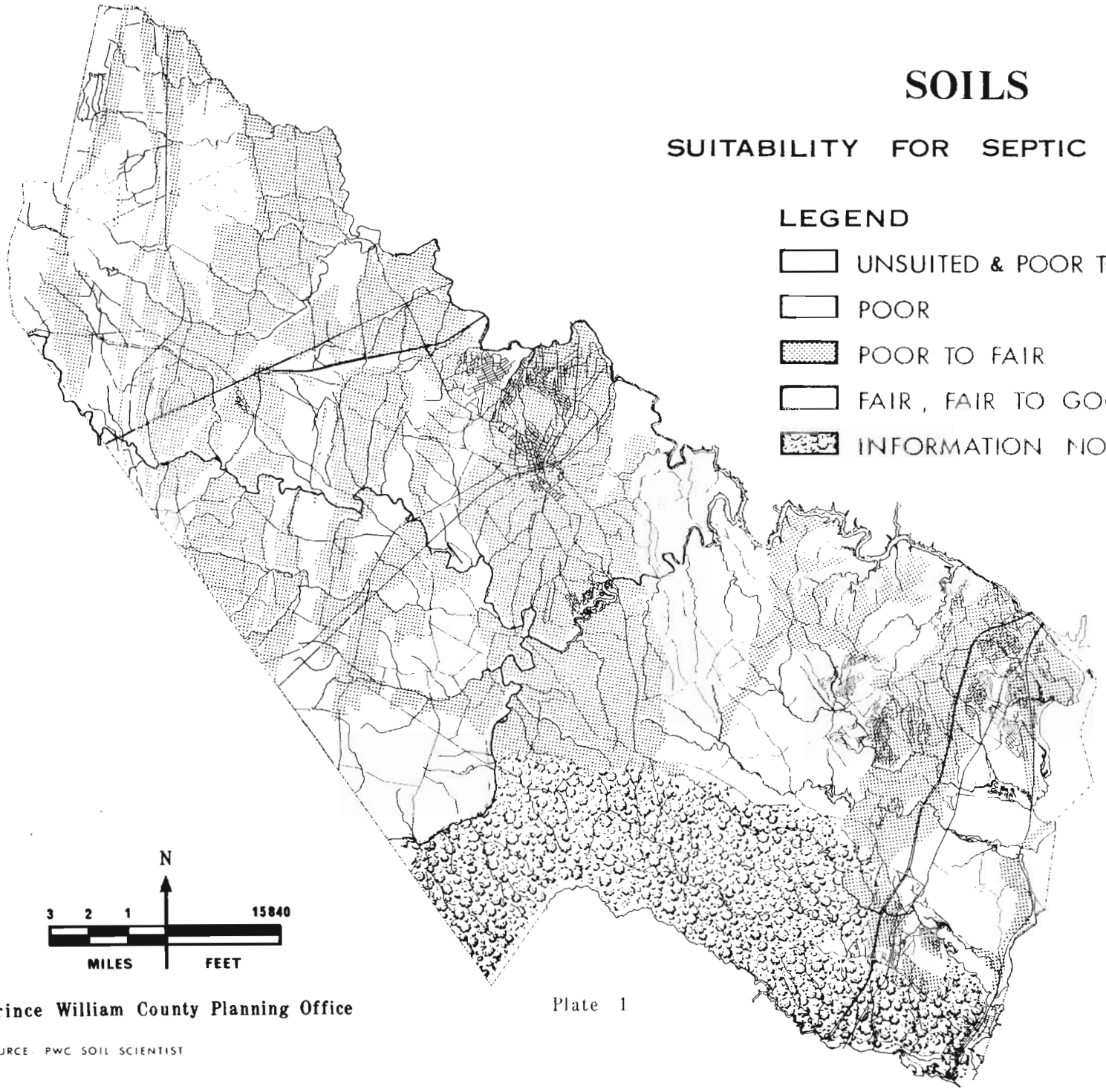


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Plate 1

SOURCE: PWC SOIL SCIENTIST

Natural and Cultural Features

While some aspects of the physical environment have a direct influence on land use decisions, other less obvious factors may be overlooked. As a consequence, extraction of mineral resources may conflict with residential development or needed surface water supplies may be contaminated by the cumulative effect of land clearance and construction activity. Worse, incremental changes in topography and additional paved surface areas may result in severe flooding with unnecessary threats to life and property.

Careful attention to the constraints imposed by the natural features of the land will not only avoid undesirable effects but will also provide opportunities for improving the quality of life for the County's residents and for making the best possible use of the resources present.

Prince William has abundant natural resources in the form of forests, mountains, scenic areas and wetlands. Greater understanding of these resources and of natural constraints can help in the formulation of more comprehensive land use policies and provide better bases for land use decisions. As the County becomes increasingly urbanized, the natural environment and its resources require more attention than was given them in the past.

SOILS

Suitability for Various Uses

Soil surveys and other data provide a wealth of detailed information regarding soil types, slopes, erodability, drainage, probable flood plains, and other characteristics. From this information, land use suitability ratings may be derived including ratings for:

a. Forestry
b. Agriculture
c. Septic Systems
d. Sanitary Landfills
e. Building Sites and Road Beds
f. Landscaping (post-development)
g. Tolerance for cut and fill

To date, county-wide, generalized maps have been prepared only for suitability for septic systems. Other suitability maps should be prepared, both in generalized form for the County as a whole and in detail as part of the area planning process.

Suitability for Septic Systems

Septic systems depend largely upon the ability of the soil to absorb water. The two primary limiting variables are impervious soils and wet soils. Impervious soils are dense soils that inhibit the free flow of water. Such soils usually have a high clay content. Wet soils have a high moisture content because of a high water table or poor drainage.

Other factors considered in determining suitability are the degree of slope, the likelihood of the area being in a flood plain, depth of the soil to bedrock, nearness to wells or other septic drain fields, length of time that the field will be used, size of the drain field and the amount and type of effluent expected. Utilization of septic systems in inappropriate areas will produce serious health hazards due to contamination of surface waters, wells and soils.

Plate 1 indicates generalized areas that are unsuitable for septic systems. Four degrees of suitability are shown:

1. unsuited and poor to unsuited
2. poor
3. poor to fair
4. fair, fair to good and good

In Prince William, by far the greatest proportion of land is in the first three classes, indicating that septic systems in these areas should be prohibited or stringently regulated where permitted. The Public Health Department is responsible for approving septic tanks. Persons planning to build homes in these areas should obtain septic tank approval prior to making any financial commitments. Very large lots of 5 to 10 acres may be necessary in these areas, depending upon local conditions. A possible requirement would be the identification of two drain fields on each building lot.

Other methods of wastewater treatment should be sought to alleviate existing problems and to provide for less intensive development beyond the reach of public sewer systems. In addition, a staging plan for the expansion of public sewer services to unsewered areas should be developed so that Health Department officials will know how long an area will go without sewers. Areas where public sewers will be available in five or ten years could be developed more intensively than areas where sewers would not be available for a longer period.

WETLANDS

Recently enacted state legislation is aimed at protecting the wetlands of Virginia. The Declaration of Policy of the Act (62.1-13) reads in part:

> "The Commonwealth of Virginia hereby recognizes the unique charactor of the wetlands, an irreplaceable natural resource which, in its natural state, is essential to the ecological systems of the tidal rivers, bays and estuaries of the Commonwealth. This resource is essential for the production of marine and inland wildlife, waterfowl, finfish, shellfish and flora; is valuable as a protective barrier against floods, tidal storms, erosion of the shores and soil within the Commonwealth; is important for the absorbtion of silt and pollutants; and is important for recreational and aesthetic enjoyment of the people....."

The act provides for regulation of use and development of wetlands by the state. However, localities are given the option of adopting a local zoning ordinance contained in the act. The act's provisions should be carefully studied to understand its implications for Prince William. Information should be gathered as to the location and condition of wetlands in the County. While the primary concern should be focused on tidal wetlands, freshwater inland wetlands should be considered for protection as well.

GEOLOGY

The underlying rock and unconsolidated materials beneath the soils of the County are significant in that they determine to some extent the nature of the soils, the availability of ground water and the presence of mineral resources such as clay, sand, gravel and stone.

Four geologic provinces lie beneath the surface soils of Prince William County: the Blue Ridge Complex, the Triassic

Lowland, the Piedmont Province and the Coastal Plain. A generalized interpretation of the materials in these provinces is contained in Table 1 and shown on Plate 2.

GROUND WATER

The availability of ground water is potentially of great importance to Prince William County, which presently has no long range plan for water supply. As indicated on Table 1, the best sources of ground water are probably in eastern Prince William County, where deep wells in the Coastal Plain could yield several hundred gallons per minute of generally soft water. In the Triassic Lowland Province, which includes the area around Manassas, deep wells can yield over 100 gallons per minute of generally hard water. Ground water in the County is generally collected locally from rainfall rather than from significant underground aquifers.

While these ground water supplies are adequate for individual homes or small community water systems, they do not indicate a sufficient supply for the County to depend upon in the future. The Town of Manassas has already developed a surface water supply to replace its wells, and the Greater Manassas Sanitary District is preparing to purchase surface water from both the Town of Manassas and Fairfax County. An in-depth study of the County's future water supply is needed.

MINERAL RESOURCES

The mineral resources of Prince William County are predominantly those used in building: clay, sand and gravel, and stone. Abundant clay resources in the metropolitan area have made brick a common local building material. Sand and gravel are the most widely used mineral resources. Although stone has been quarried for buildings in the region in the past, its primary use currently is as crushed stone for use as aggregate in roadbeds and concrete.

It should be noted while materials such as sandstone and gravel are inexpensive to produce, their transportation costs are very high. The transportation of such materials as little as 20 miles may cost more than the materials themselves. Consequently, given the importance of having such materials in reasonable proximity to areas of urbanization, development should be controlled to prevent the total loss of economically extractable minerals and resultant increased building costs. Needed mineral resource areas should be identified for protection from other uses that would prevent the economic extraction of these resources.

GEOLOGIC FORMATIONS

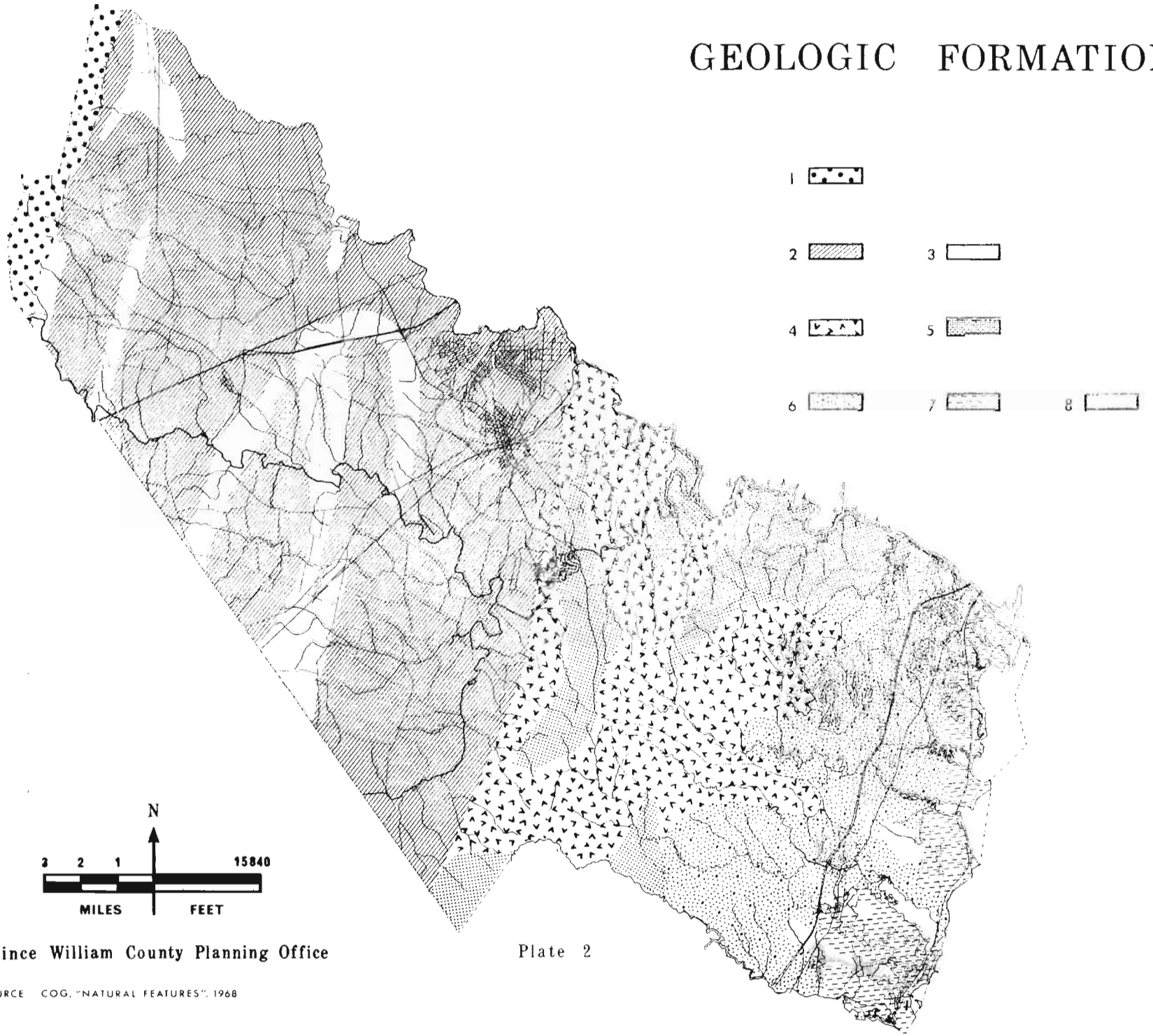

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Plate 2

SOURCE COG, "NATURAL FEATURES", 1968

TABLE 1: GENERAL INTERPRETATION OF GEOLOGIC FORMATIONS IN PRINCE WILLIAM COUNTY

Map Number and Type of Underlying Rock	General Topography of Surface	Depth of Soils to Underlying Rock	Remarks
I Blue Ridge Complex			
1 Quartzites, granite and volcanic rock	Upland hills, ridges and low mountains	Generally less than 10 feet	Poor source of ground water, which is found in weathered layers, joints and fractures
II Triassic Lowland			
2 Red sandstone, shale conglomerate	Gentle slopes, scattered low ridges, hills with flat summits	Generally less than 10 feet	Moderately good source of ground water, except where shale predominates, at depths of 500 feet or more; Poor drainage in soils near basaltic dikes
3 Basaltic rock - Diabase and Gabbro in sills and dikes, trap rock	Low hills and ridges	Generally less than 10 feet	Major source of crushed rock for construction; Poor source of ground water; Soils generally high in clay content with shrink-swell potential
III Piedmont Province			
4 Fine grained mica schist, chlorite schist	Rolling and hilly	Maximum 200 feet, average 50 feet	Moderate source of ground water in soils above bedrock
5 Granitic Rock	Generally low local relief	Maximum 100 feet, average 35 feet	Source of crushed rock and building stone; Some water in overlying soils and on joints and fractures
IV Coastal Plain (Unconsolidated Materials over Piemont Rock)			
6 Patuxent formation, inbedded gravel, sand and clay	Very hilly terrain	Up to 350 feet in outcrop areas	Major aquifer; Water occurs under artesian conditions in deep areas; source of sand and gravel, but interbedded with clay
7 Arundel and Patapsco formation - massive clay, variegated and sandy	Very hilly terrain of moderate relief	As much as 300 feet in outcrop areas	Poor source of ground water; source of building brick clay
8 Aquia Formation - quartz sand	Gently rolling hills	As much as 60 feet in outcrop areas	Good source of ground water; serves as aquifer

Sources: Prince William County Generalized Soils Map
Metropolitan Washington COG, " Natural Features", 1968.

SURFACE WATER

The quality of surface water is affected by several factors: the geological systems which inhabit the water (from bacteria to mammals); the chemical processes which take place in the water (including the breakdown of waste products); and physical processes such as siltation (natural erosion as well as increased erosion from construction activity). These and other factors determine whether the water is usable and at what cost.

WATERSHEDS

The size, orientation, and topography of the various watersheds have important implications for planning and subsequent land use decisions.

Consideration of watershed characteristics is important for protecting water supplies, for economic water and sewer planning, maintaining wildlife areas and for preventing erosion and siltation.

There are eleven major watersheds in Prince William County as shown in Plate 3, all of which eventually drain into the Potomac River.

The Upper, Little and Lower Bull Run, Broad Run, Cedar Run, and the Occoquan River watersheds are all part of the larger Occoquan Basin. The entire basin contains 600 square miles and includes parts of Loudoun, Fairfax, Fauquier and Prince William Counties. It supplies water for over 600,000 people in Northern Virginia, from the reservoir located on the lower Occoquan.

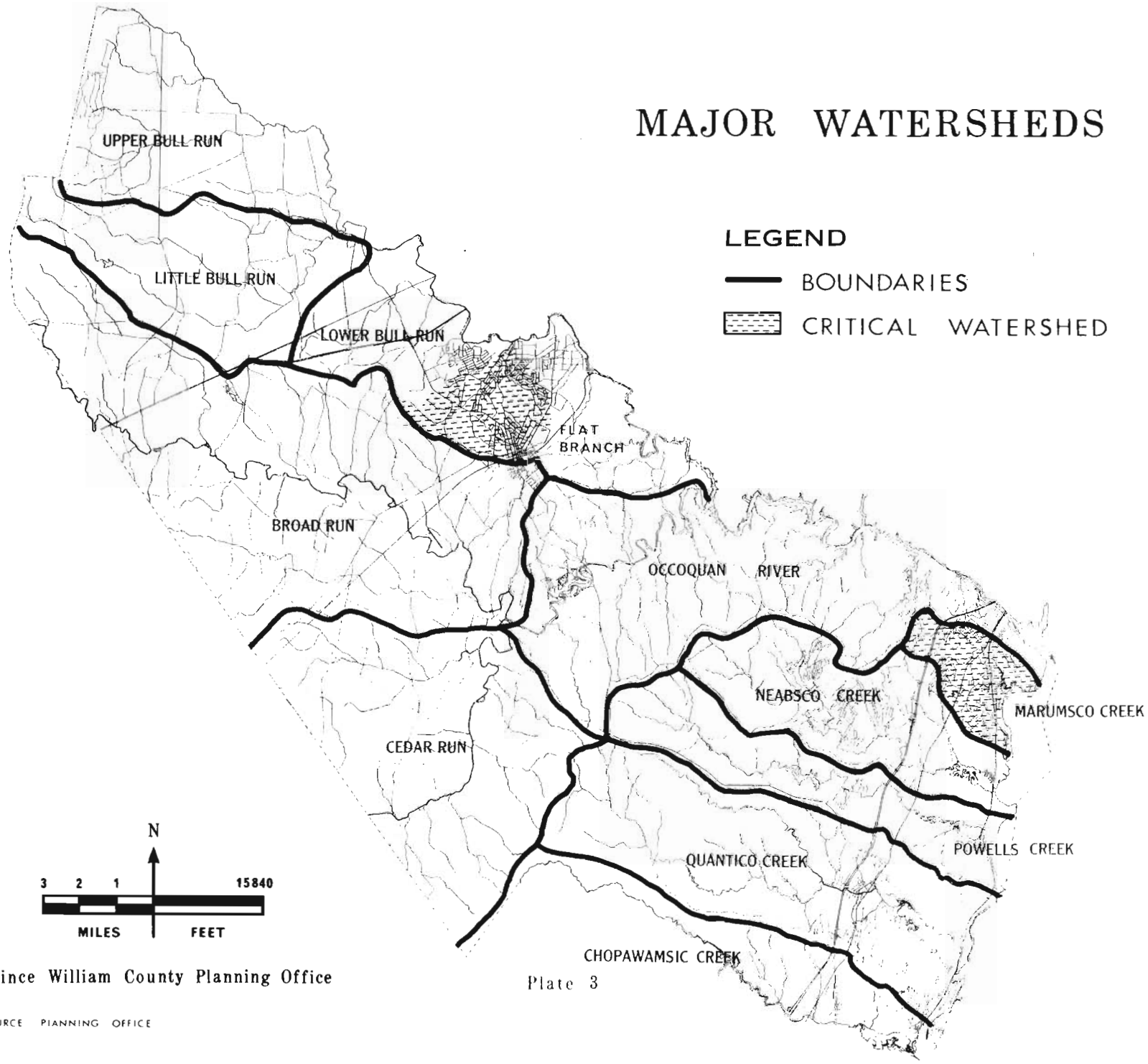
A second reservoir is located on Broad Run and serves the town of Manassas. A third large impoundment, Lake Jackson, located on the upper Occoquan, does not now serve as a water supply, although proposals have been made to obtain water from this source for the Greater Manassas Area. A water impoundment on Cedar Run has also been proposed as a future source of drinking water for Prince William County.

The Marumsco, Neabsco, Powells, Quantico, Chopawamsic and Farm Creek watersheds all drain directly into the Potomac along the southeastern border of the County. A recreational lake of approximately 120 acres is located on Powells Creek in the Country Club Lake development. Valuable natural marsh areas have been identified in the embayments of these creeks. Protection of several of these natural marsh areas should be undertaken before they are all destroyed by urban development.

Two small watersheds in Prince William County have been declared "critical" as a consequence of flooding problems which have affected existing homes in the lower portions of the watersheds. The two are the Flat Branch watershed, which is a smaller basin within Lower Bull Run, and the Marumsco Creek watershed.

Within these two critical areas, developers are currently required by the County to pay into a fund for downstream drainage improvement. Since the construction of buildings and the paving of streets and parking areas create impervious areas with a consequent increase in storm water runoff, developers are charged by calculating the number of impervious acres of land created by the development. The funds thus collected have been placed in a separate account and will be used at a future time to finance drainage structures in downstream areas. This method for obtaining drainage and flood control funds has been proposed to be applied County-wide. Special watershed studies will be necessary before this can be accomplished.

MAJOR WATERSHEDS

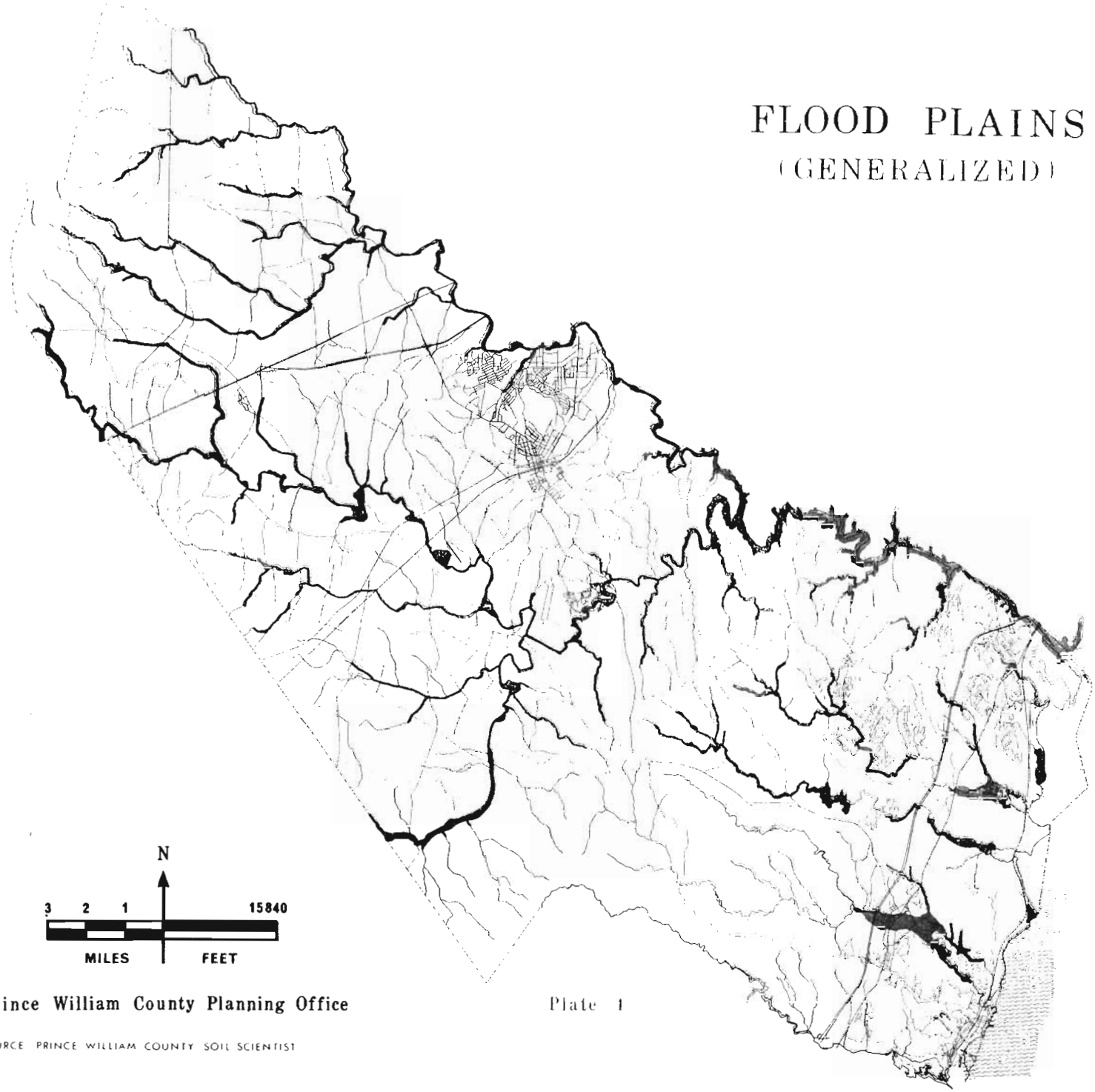


Prince William County Planning Office

Plate 3

SOURCE PIANNING OFFICE

FLOOD PLAINS
(GENERALIZED)



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MILES FEET

Prince William County Planning Office

Plate 1

SOURCE PRINCE WILLIAM COUNTY SOIL SCIENTIST

FLOOD PLAINS

Flood plains are areas subject to periodic flooding. The maximum extent of flooding that can be expected every 100 years is often the standard by which flood plains are measured. The best approach to delineating the flood plains is through detailed engineering and hydraulic studies which take into consideration planned future development in the Watershed. Such studies are expensive and time consuming, however.

A less accurate but still useful method is to use soils data to establish probable flood plains. This approach generally produces more conservative estimates than does an engineering study. The soils approach also does not allow for consideration of the effects of future development on increased runoff and consequent flooding. This method depends upon the identification of wet soils or of alluvial soils deposited over past years.

Unfortunately, recent experience with heavy storms has shown that residential and commercial development has occurred in and adjacent to flood plains in Prince William County with threatened loss of life and very extensive property damage as a result. The need for effective flood plain regulation is clear.

Currently, county-wide flood plain information is inadequate for regulating development. The current flood plain boundaries, as shown on Plate 4, are based entirely on soils information.

TOPOGRAPHY

The topography of Prince William County shows many contrasts, from low tidal marshes along the Potomac and very hilly terrain in the southeast to relatively flat areas in the central portion of the County. The Bull Run Mountains, composed of several rocky ridges, border the County on the northwest. Elevations vary from sea level to 1,350 feet.

The steepness of a slope is measured by the change in elevation for a given horizontal distance and is reported as a percentage. For example, a 25% slope is equal to a rise of 1 foot for each 4 feet measured horizontally. Plate 5 indicates slopes of 15% or greater in Prince William County. Such slopes are generally too severe for development and should be preserved as open space.

Table 2 indicates the general classes of land use suitable for various slopes and for flood plains. Regulations are needed to prevent the intensive development of steep slopes and to assure that what development does take place is carried out properly to prevent soil erosion.

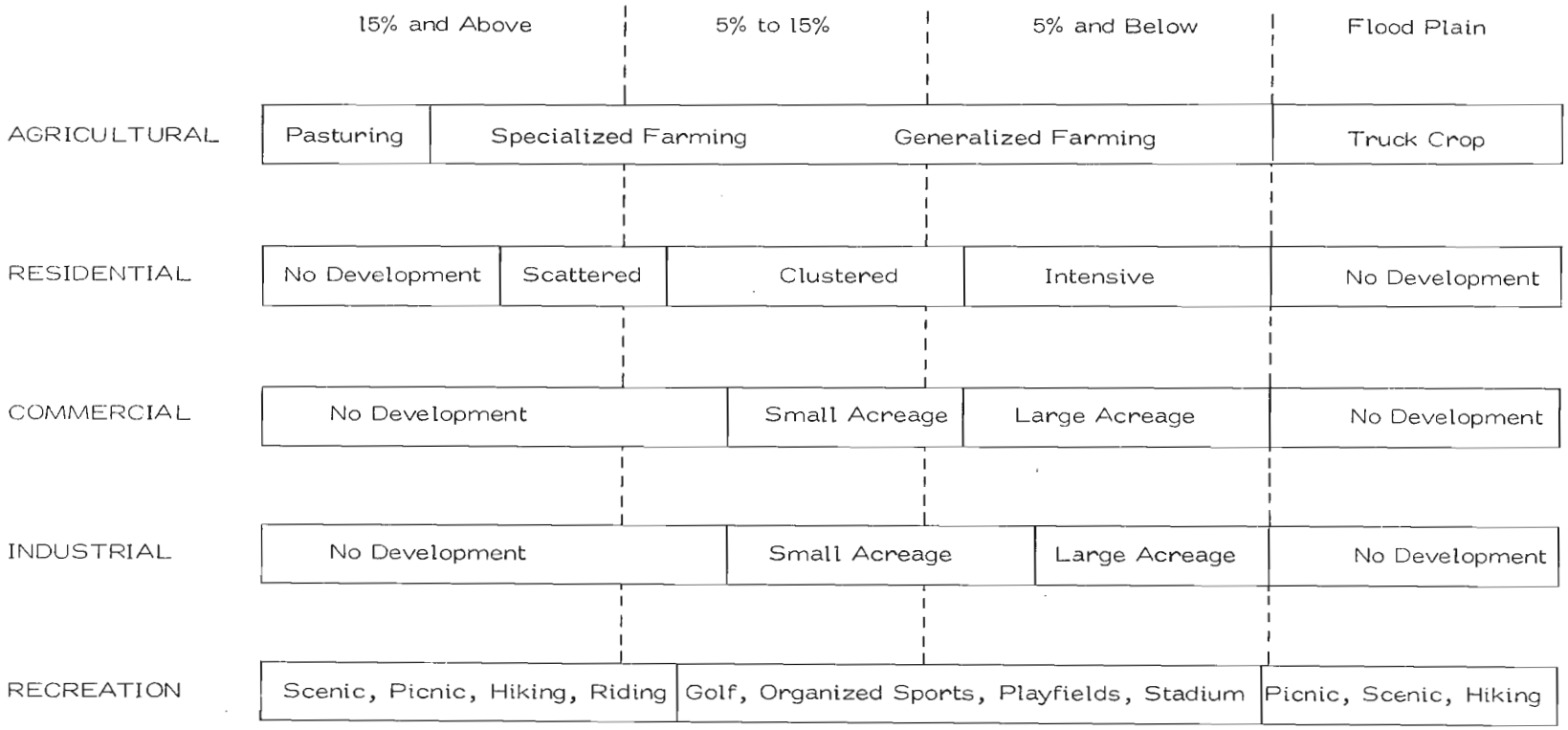
FORESTED AREAS

Forested areas serve several functions. Forests moderate storm water runoff and help to control erosion, particularly on steep slopes. As a result, forests protect surface water supplies as well as help to prevent flash flooding. Such areas also affect the micro-climate and provide recreational opportunities, wildlife habitats, and in some cases commercial opportunities.

Prince William County is fortunate in that it still has extensive woodlands. As can be seen in Plate 6, the largest areas of forests are located in the eastern portion of the County, where slopes are generally steeper and the soils are less suited for agriculture.

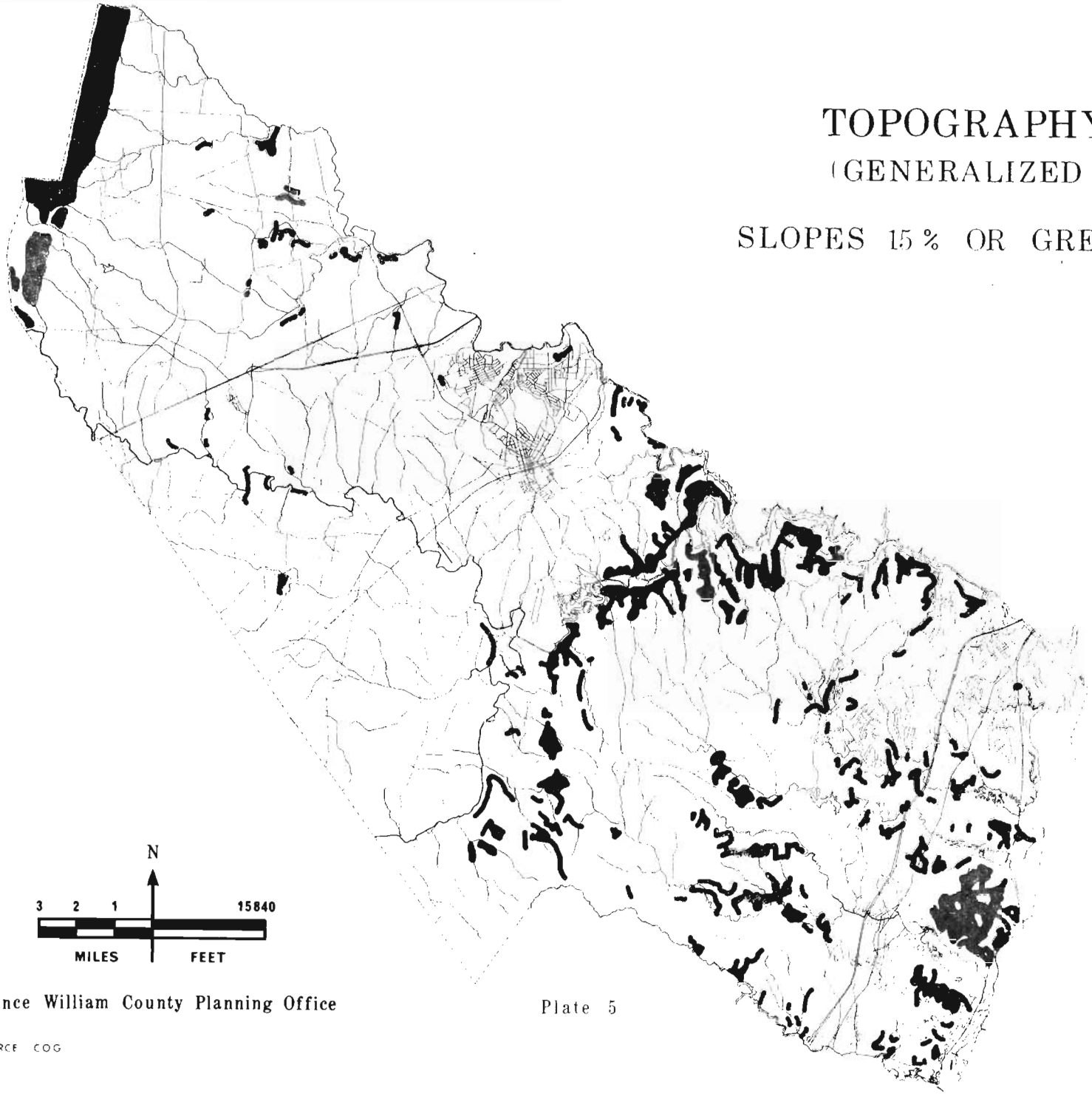
The forests in the County are composed primarily of oaks, hickory, pines, tulips and maples. On the coastal plain in southeastern Prince William, oaks and pines predominate. The pines take hold in abandoned fields and provide the necessary shade for the oaks which eventually dominate. In the mountains in the northwestern part of the County, the dominant association was oak-chestnut until a fungus disease destroyed the chestnut early in this century. This area is still adapting to this change.

TABLE 2: OPTIMAL TYPES OF DEVELOPMENT ON SLOPES AND FLOOD PLAINS



TOPOGRAPHY
(GENERALIZED)

SLOPES 15% OR GREATER



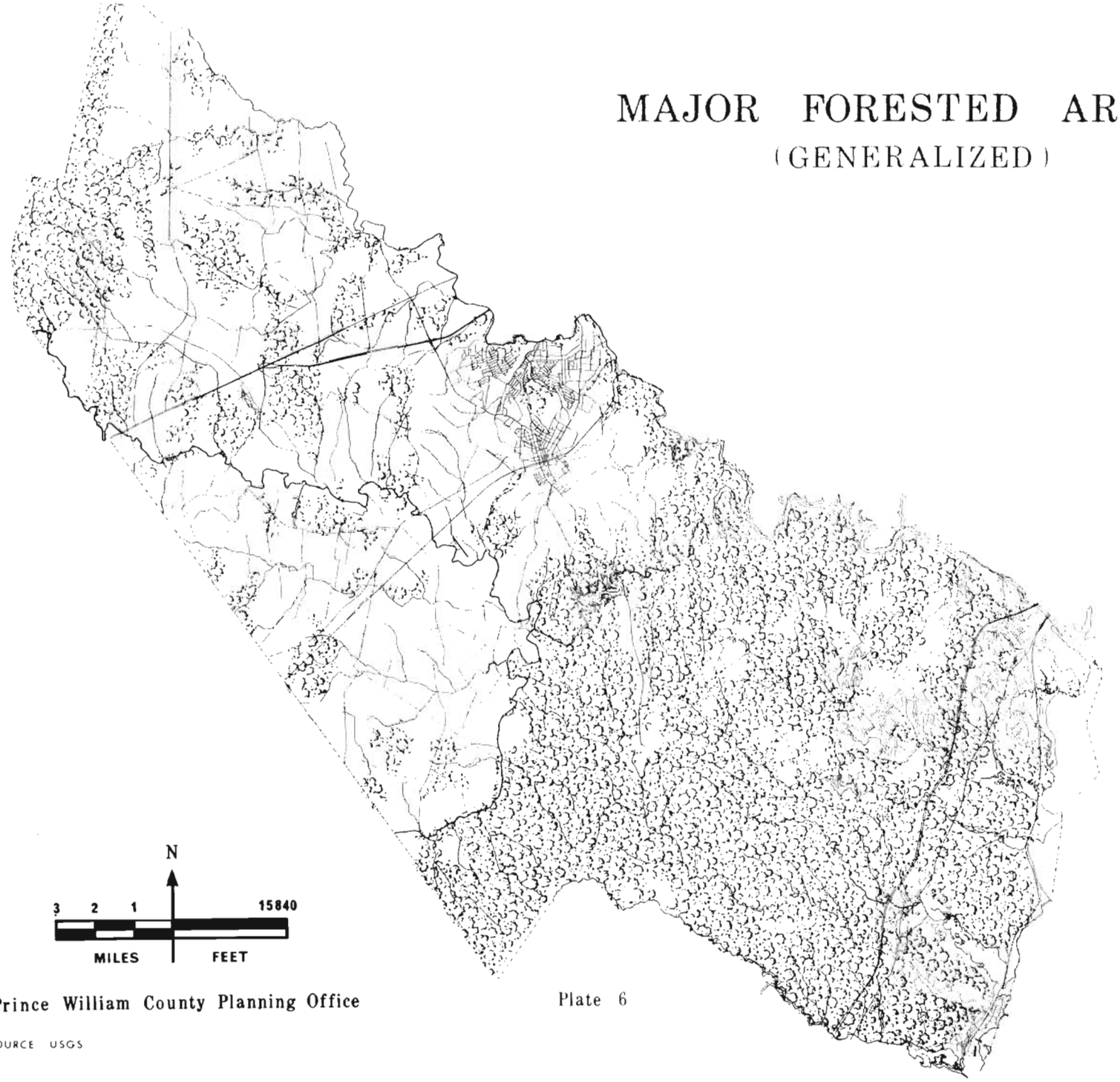
Prince William County Planning Office

Plate 5

SOURCE COG

MAJOR FORESTED AREAS

(GENERALIZED)



Prince William County Planning Office

Plate 6

SOURCE USGS

CRITICAL ENVIRONMENTAL AREAS

The Open Space Plan and Program published by the Metropolitan Washington Council of Governments in 1971 identified "areas of maximum environmental quality" in the region. These areas were identified by superimposing maps of streams, flood plains, steep slopes and woodlands. Contiguous areas demonstrating a significant concurrence of these features were judged areas of maximum environmental quality. Their identification was concerned with large areas and was intended to provide information to guide public agencies in acquisition of regional open space for conservation, outdoor recreation, and aesthetic purposes.

On May 8, 1972, the Northern Virginia Planning District Commission received a memorandum from the Division of State Planning and Community Affairs concerning Senate Bill #436 which requires a delineation and evaluation of "critical environmental areas". A critical environmental area has been defined as:

> "....any area which due to its location, nature or uniqueness must be preserved in order that special values essential in maintaining vital ecological relationships, as well as areas of special scenic or historic significance, be protected and conserved for the benefit, enjoyment and general welfare of the people of the Commonwealth."

In response to this request, the Northern Virginia Planning District Commission submitted the areas of Maximum Environmental Quality developed by COG as well as the results of other studies and the recommendations of local planning staffs. No additional areas were identified in Prince William County. In the future, the County may wish to identify its historic sites, its unique rural villages and additional natural features as "critical environmental areas". Plate 7 shows the County's Critical Environmental Areas as defined by the Northern Virginia Planning District Commission.

In Prince William County three large areas not in public ownership or otherwise developed were identified.

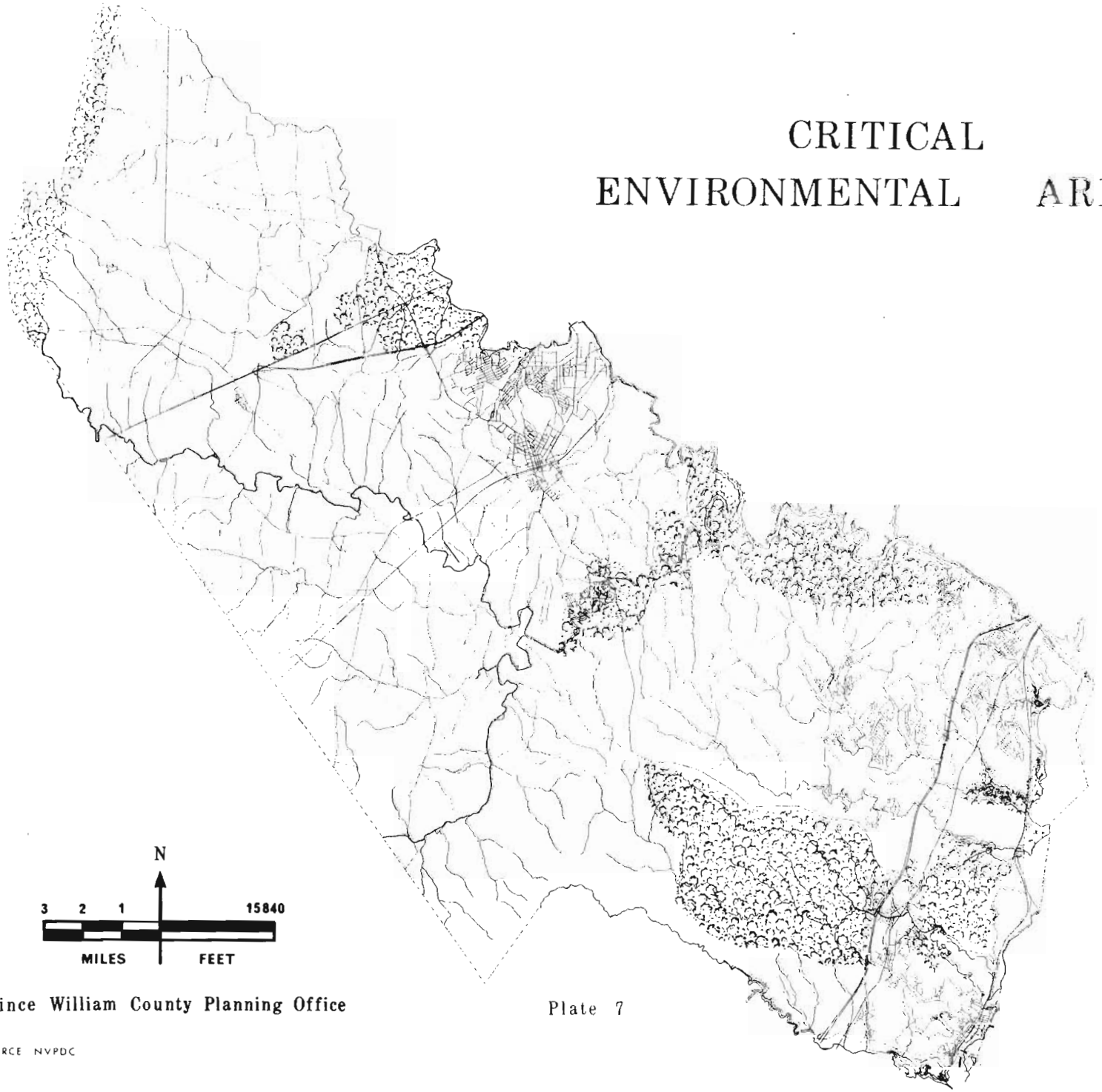
Bull Run Mountain at the western boundary of the County is approximately 7,700 acres in size. It is characterized by steep wooded slopes. It has been suggested that ski slopes could be developed on Bull Run Mountain, only 40 miles from Washington, D.C.

Bull Run - Occoquan Creek in the center of Prince William County is an area proposed for acquisition. This area, combined with existing parkland along Bull Run, would make this the region's largest park. The park could provide the full range of water-oriented activities along the vast areas of woodlands. The streams of this area could be protected as high quality water sources.

The Cherry Hill Area in the southeastern part of the County includes some of the greatest natural environmental diversity in the metropolitan Washington region. It includes portions of the Powells, Neabsco, and Quantico Creeks as they flow into the Potomac, as well as Freestone Point and Cockpit Point. There exists large areas of wetlands, and the area is characterized by very rough terrain.

It should be noted that a large strip of land along the Potomac within this last area is zoned for industrial use. How protection is to be actually accomplished is not clear in the language of the Act. Direct state regulation of prime environmental areas has recently begun in several states - notably in Vermont, Massachusetts, and Maine. Other states, including Virginia, have moved to protect specific critical areas such as wetlands, as noted earlier. Prince William County should keep informed on progress in this area in order to take full advantage of state legislation and avoid state action which would not be consistent with the County's goals.

CRITICAL ENVIRONMENTAL AREAS

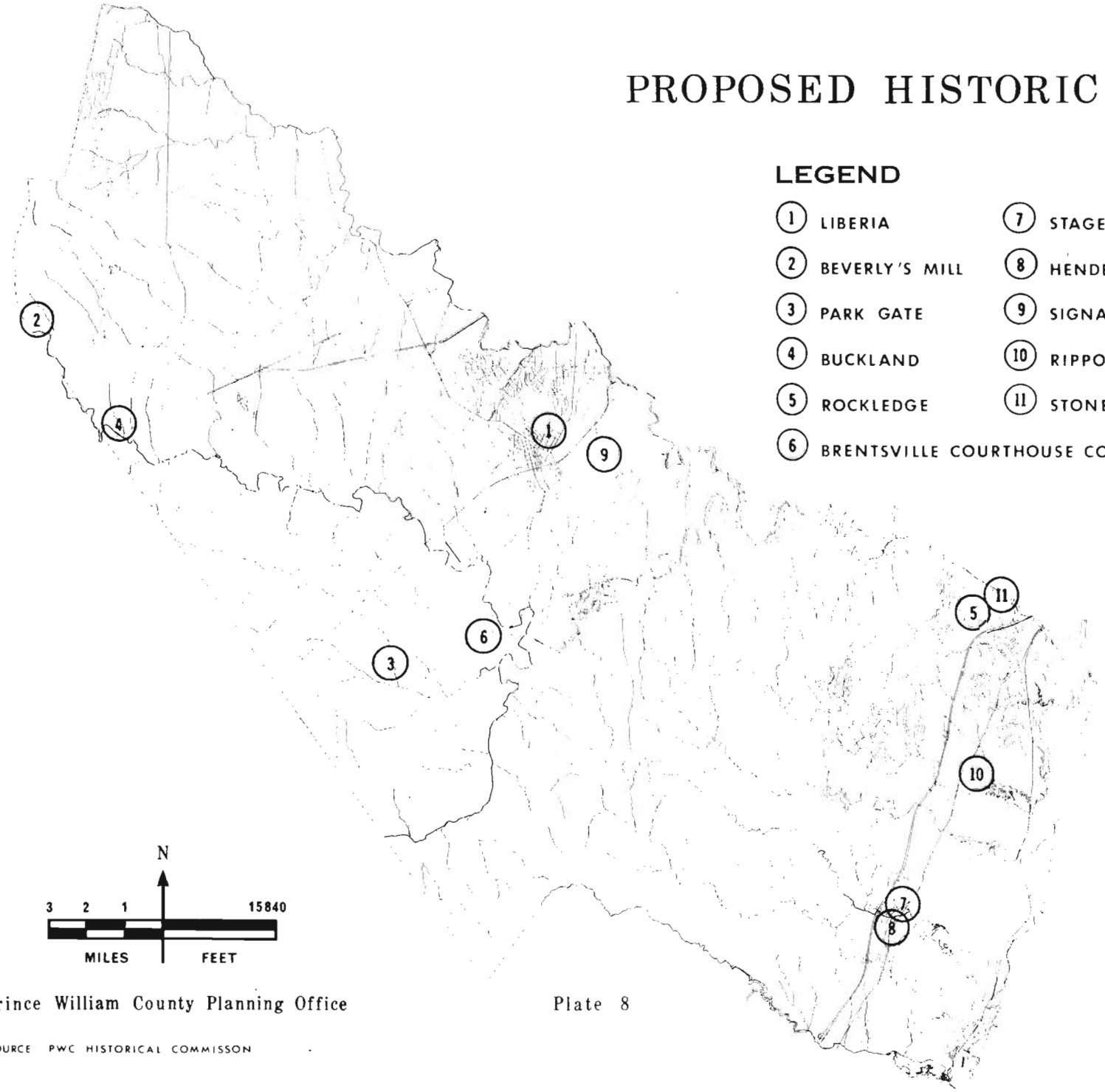


Prince William County Planning Office

Plate 7

SOURCE NVPDC

PROPOSED HISTORIC SITES



Prince William County Planning Office

Plate 8

SOURCE PWC HISTORICAL COMMISSON

HISTORIC AREAS

One of Prince William County's strongest assets is its many historic areas. The most famous of these is Manassas Battlefield Park, where the First and Second Battles of Bull Run took place. Since 1958, 900 acres of battlefield have been under federal jurisdiction. However, many other areas of the County are of great historic value and should be preserved. Realizing the need for preserving these areas, Prince William County's zoning ordinance includes a Historic Zone. In conjunction with the zoning ordinance, the Prince William County Board of Supervisors appointed a County Historical Commission. This Commission has made a survey of historical structures and sites in Prince William County. Plate 8 outlines these structures and sites. To date, none of the sites on Plate 8 have been zoned historic.

RURAL VILLAGES

The need for preservation of historic areas also applies to other resources of cultural value. For example, some of the rural villages of Prince William while not historic by definition of the zoning ordinance none the less provide a cultural link with the past. A list of these villages might include Occoquan, Brentsville, Bristow, Nokesville, Greenwich, Buckhall, Buckland and Haymarket. Unless protective measures are taken shortly, the unique historic or cultural values of these small communities may be destroyed by the spread of new suburban development and the improvement of roads and highways.

Existing Land Use

Existing land use data was obtained from the County land records of 1970. During that year a general reassessment of real property was performed. At that time, information was gathered on land use and zoning by the assessors and placed in the County's computerized land records. Table 3 summarizes existing land uses in the County for 1970, based largely on this information.

One of the outstanding features shown in Table 3 is the amount of publically owned land. The vast majority of the publically owned land is accounted for by the Quantico Marine Corps Base, the Prince William Forest Park and the Manassas Battlefield National Monument. In addition to these federal installations, publically owned land includes the Conway Robinson State Forest, the Belmont Bay Army Transmission Facility, Lake Manassas and small County-owned areas such as school sites, two community college sites, several parks, and other community facilities.

Under the residential category, it is interesting to note that land devoted to rural residential use comprised over 19% of the County. The majority of the 1970 population, however, lived in homes in the other residential categories, which together totaled less than 4% of the County's land area.

Commercial and industrial land uses each comprised less than one percent of the County. Active farm land accounted for over 28%. The amount of vacant or unused private property is not known, but it undoubtedly accounts for most of the acreage in the streets, roads and vacant category. A generalized picture of 1972 land use is shown on Plate 9.

Existing Zoning

The 1970 land records also yield estimates of the amount of land zoned in each zoning division. The zoning divisions in existence in 1970 are summarized below.

A-1	Agricultural and low density residential
R-10	Single-family residential
RT	Townhouse residential
RM-1	Garden Apartment residential
R-D	Duplex (two-family) residential
RPC	Residential Planned Community
B-1	General Business and Commercial
OI-1	Office and Institutional (limited commercial)
OI-2	Office, Institutional and Apartments
M-1	General Industrial
M-2	Light Industrial
H	Historic

Although there have been numerous changes to the zoning regulations since 1970, no new zoning divisions have been added.

The 1970 land records yield the following estimates of zoning in the County:

9,277 acres of land were zoned R-10, Single-family, of which 3,193 acres were vacant.

527 acres were zoned for townhouses, of which 333 acres were vacant.

951 acres were zoned for apartments, of which 656 acres were vacant.

9,483 acres were zoned Residential Planned Community, of which 7,545 acres were vacant (some of this vacant acreage will remain undeveloped as planned open space).

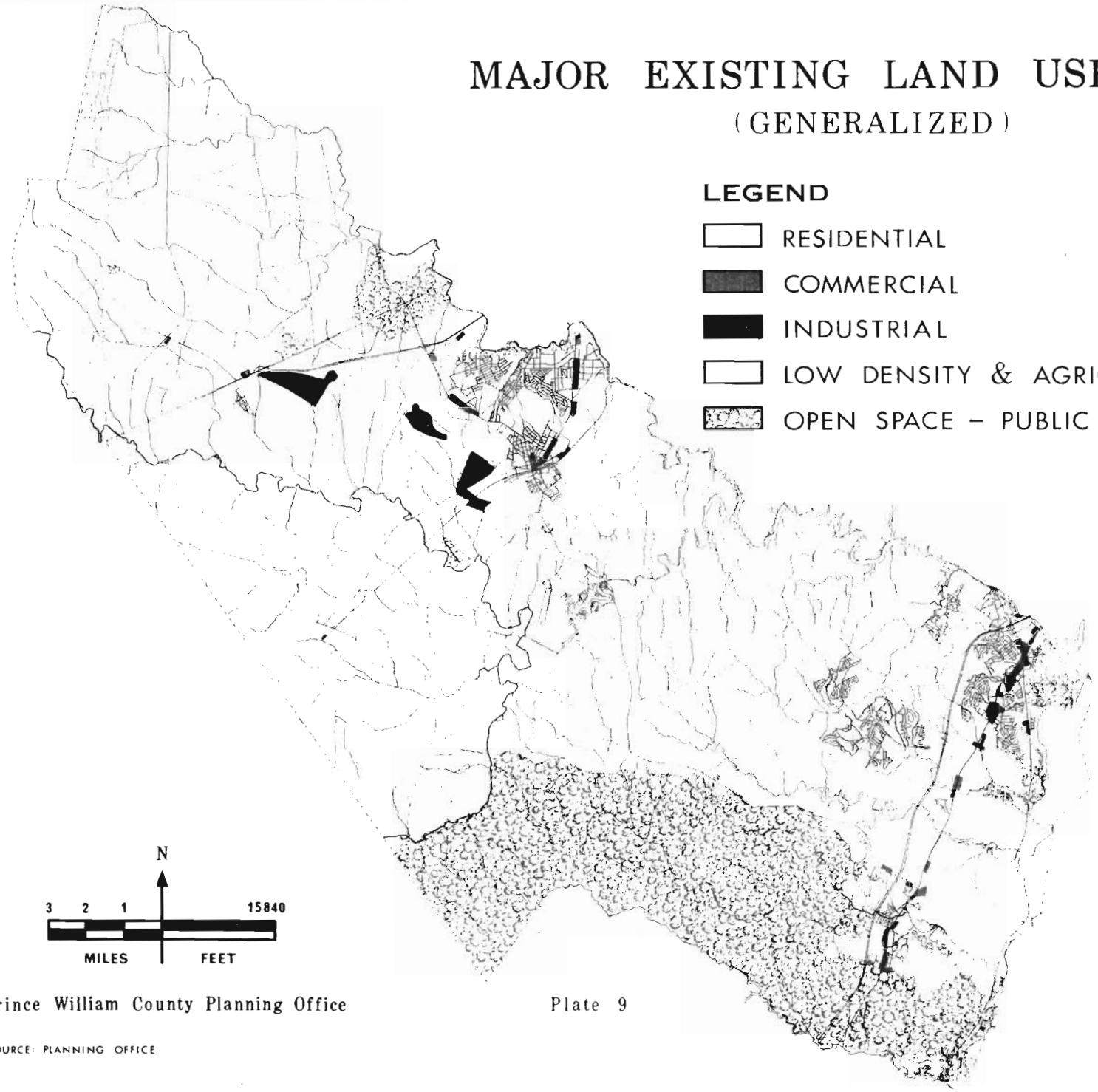
TABLE 3: EXISTING LAND USE, 1970

LAND USE CATEGORY	ACRES IN USE	PERCENT OF TOTAL
Residential (Total)	48,689	22.05
Single Family (rural)	42,115	19.07
Single Family (suburban)	5,748	2.60
Duplex	82	0.04
Town House	194	0.09
Apartment	295	0.13
Mobile Home	255	0.12
Residential Planned Community*	1,938	0.88
Commercial	1,478	0.67
Industrial	2,007	0.91
Farmland (improved)	62,600	28.35
Streets, Roads and Vacant	55,890	25.31
Publically Owned	47,728	21.62
Rail Roads	470	0.21
TOTALS	220,800 Acres	100.00%

*Residential Planned Community includes single family, townhouse and commercial uses. Vast majority of developed RPC acreage is single family. Data did not permit further breakdown.

MAJOR EXISTING LAND USES - 1972

(GENERALIZED)



Prince William County Planning Office

Plate 9

SOURCE: PLANNING OFFICE

2,616 acres were zoned for general business and commercial use, of which 1,138 acres were vacant.

65 acres were zoned Office and Institutional, of which 64 acres were vacant.

4,820 acres were zoned for industrial uses, of which 2,813 acres were vacant.

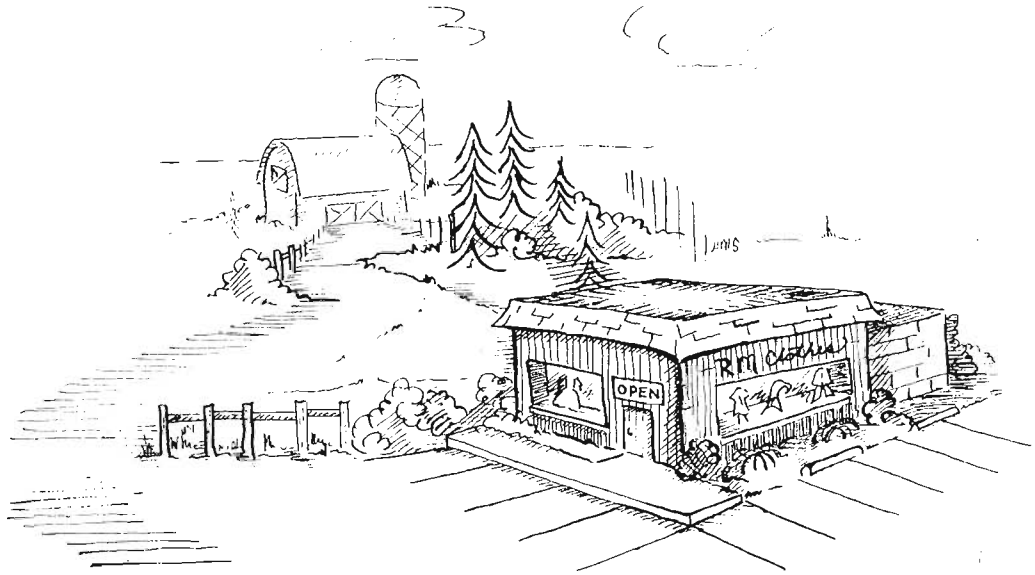
There were no areas zoned for either Duplex Residential or Historic. These zoning divisions remained unutilized through 1972.

The remaining areas of the County were zoned A-1, Agricultural and low density residential.

While the accuracy of these figures for 1970 has been questioned, they are precise enough to permit some general conclusions. The major conclusion is that zoning in Prince William County has far outstripped development. Rezoning actions between 1970 and the present have added to all of the categories indicated above except A-1, R-D, and H.

Although development since 1970 has continued at a relatively constant rate in all types of land uses, there remains a large proportion of each zoning category that is still undeveloped. Tens of thousands of new dwelling units and close to 100,000 persons could be added without rezoning another acre of land to residential uses. Commercial and industrial uses could likewise be developed, in theory, without additional rezoning action.

Zoning well in advance of development may be advantageous to the County with respect to zoning divisions such as industrial and Residential Planned Communities. Marginal benefit accrues to the County also in the form of additional tax revenues, based upon higher land values resulting from rezoning actions. Disadvantages are also seen in the rezoning of land well in advance of development. The price of "zoned" land rises more rapidly than "unzoned" land, resulting in higher development costs and a tendency on the part of serious developers to seek out yet unzoned land. Also, the potential that zoning offers for controlling the rate and directions of growth are minimized. Pressures for rapid development beyond the capacity of the County's fiscal resources are more difficult to resist, with sewage treatment capacity left as a relatively untested tool for controlling and directing growth.



Population Characteristics

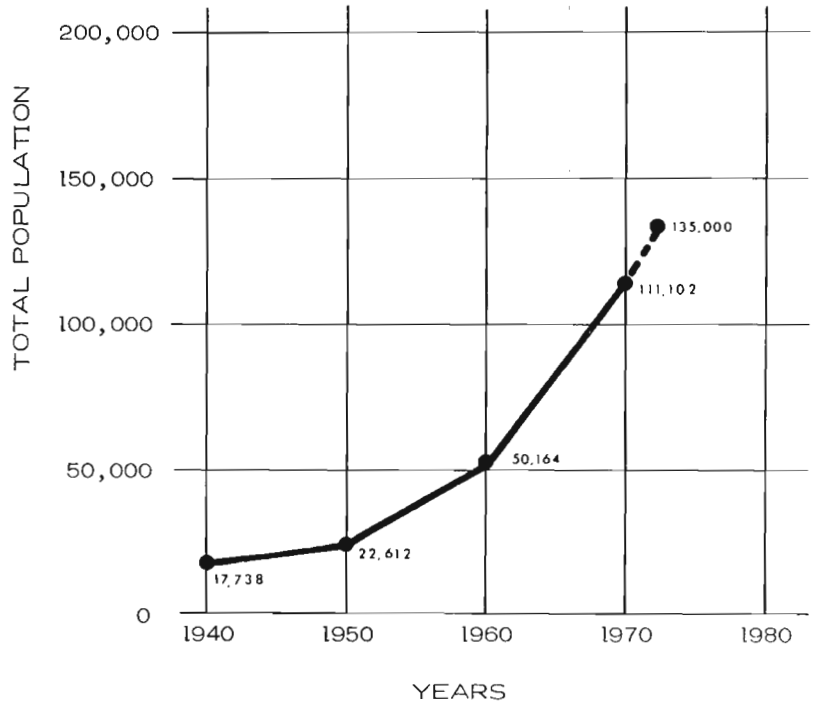
GROWTH

Population growth in Prince William County during the past 33 years is shown on Graph 1. In 1960, 50,164 persons lived in the County. By 1970 this figure had grown to 111,102 representing an increase of 121.5 percent. Prince William's recent growth is attributable to net in-migration and to natural increase. These elements were roughly of the following magnitudes between 1960 and 1970:

ELEMENTS	INCREASE Number	Percent
In-migration (excess of persons moving into the County over those moving out)	41,239	67.7
Natural increase (including births to in-migrants)	19,699	32.3
Total population increase 1960-70	60,938	100%

An important factor for future population growth is the County's relationship to the Washington Metropolitan Area. It was reported by the U. S. Census that in 1970, 48% of the County's workers, including members of the armed forces, commuted to places of work outside the County. It would be fair to surmise that most of these went to other parts of the Washington area. In appraising the effects of employment growth on a County's population, it is generally estimated that "primary" or "basic" employment gives rise to an equal amount of secondary employment. That is, County residents engaged in making things or selling services outside the County require the services of an equal number of service workers, retailers, construction workers, etc., in the County. So it would seem that some 95 percent of the County's workers are directly or indirectly affected by the volume of employment in the Washington Metropolitan Area.

GRAPH 1: POPULATION GROWTH IN PRINCE WILLIAM



Sources: U. S. Census of Population and
Prince William County Planning Office (1973 estimate)

PROJECTIONS

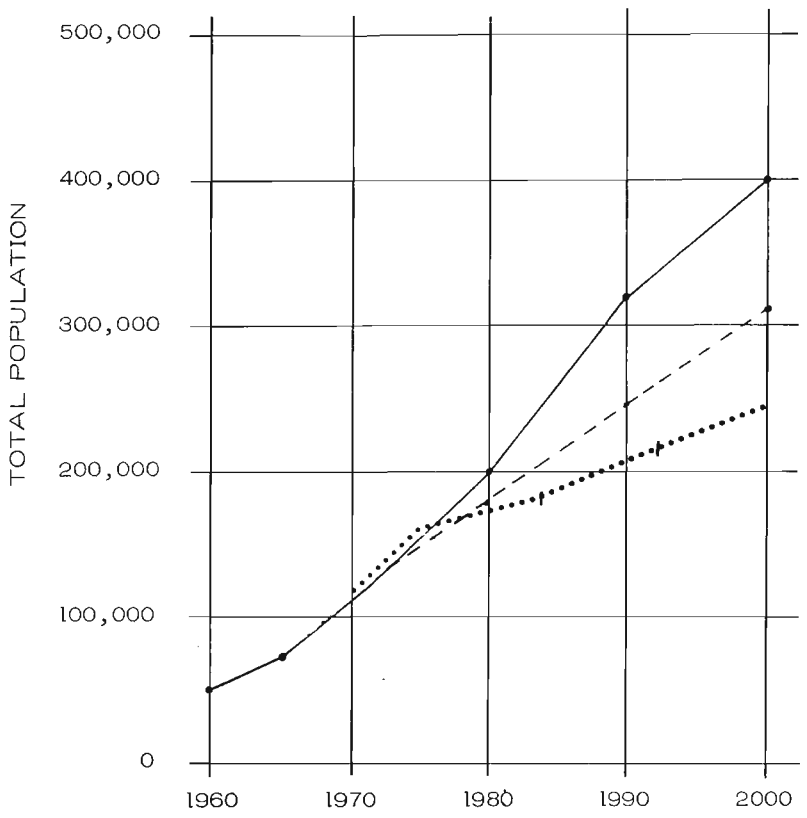
A number of different population projections have already been made for Prince William County. These projections are summarized in Table 4 and in Graph 2. As the period of the projections increases, the resulting projections differ more widely.

The projections of the Virginia Division of State Planning and Community Affairs (DSPCA) are issued by the Tayloe Murphy Institute of the University of Virginia. These projections are based on fertility assumptions of Census Series D, state economic analyses, general economic conditions, natural increase rates, migration rates and physical development factors in the County.

The projection of the Metropolitan Washington Council of Governments resulted from a sophisticated modeling process for the metropolitan area. Known generally as the "Empiric Model," it is an attempt to distribute a predetermined population projection for the entire metropolitan area to its individual parts. It is a policy-oriented model which uses as basic inputs a projected transportation system, policies on sewer and water services, zoning and open space. Other factors such as employment and family size are also included.

The Prince William County Planning Office has prepared a year by year population projection between 1970 and 1980, with ten-year estimates thereafter to the year 2000. These projections are based mainly upon past trends: building permits issued, estimates of family size trends, existing zoning, past growth, and projections received from other sources for growth in the Washington, D. C. area generally. These projections are higher than the other two.

GRAPH 2: POPULATION PROJECTIONS



Sources:

—— Prince William County Planning Office, 1971.
---- Division of State Planning and Community Affairs, 1972.
..... Metropolitan Washington Council of Governments, Alternative 6-2, 1972.

TABLE 4: POPULATION PROJECTIONS

	Prince William County Planning Office (1971)	Division of State Plng & Comm. Affairs (1972)	Metro Wash. Council of Govts. (1972)
1971	120,822	121,940	
1972	126,907		
1973	135,422		
1974	144,365		
1975	153,755		
1976	163,615		161,000
1977	172,073		
1978	180,779		
1979	189,808		
1980	199,000	182,000	
1984			182,000
1990	318,800	245,000	
1992			215,000
2000	400,000	310,700	

It is interesting to note that the population estimated by the DSPCA for the year 1971 is higher than that of the Prince William Planning Office. Building permit data through mid-1972 suggest that the population for early 1973 could surpass 140,000 persons rather than the previously projected 135,000 persons. There is some evidence to suggest that a decrease in growth may take place due to a much more rapid decrease in family size than previously projected. This factor is presently under study. Sewer availability may also become a limiting factor, although this issue has not been analyzed as of this time.

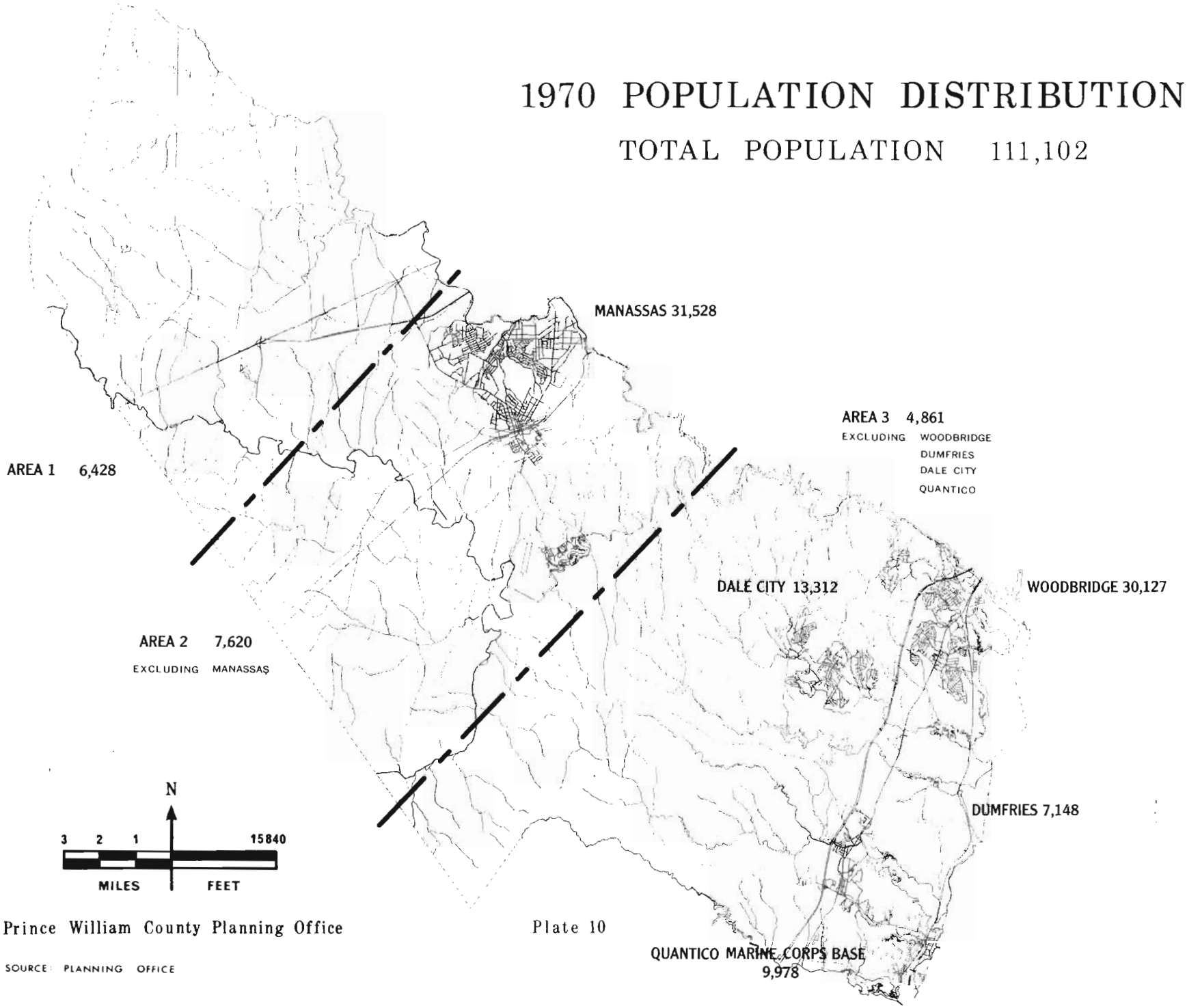
DISTRIBUTION AND DENSITY

Population density is still rather moderate in Prince William County with few really large concentrations of population. The largest urban areas are Manassas, Manassas Park, Woodbridge-Marumsco and Dale City (see Plate 10). The Manassas area owes its relatively high population density to over a century of superior rail and highway connections, which recently have contributed to some industrialization. The Occoquan and Neabsco Districts (within the I-95 Corridor) are within commuting distance by good highways of Fort Belvoir, the Quantico Marine Corps Base and other military installations and employment centers in Fairfax County, Arlington, Alexandria and the District of Columbia. Further rapid population increases may be expected in the I-95 Corridor. The Manassas, Manassas Park area may be expected to continue to grow rather rapidly with improved commuting via Route 66 to employment areas. Continued industrial development in the Manassas area will also encourage growth.

Historically, a substantial portion of the County's population has resided in rural areas. However, with the advent of the 60's, urbanization became apparent. By 1970, of the 111,102 total population, 76,815 people (69.13%) lived in incorporated towns or un-incorporated places in the county (see Table 5). The rural population was composed of the remaining 34,287 persons or less than one-third of the total population. Prince William County population is no longer essentially rural even though approximately 75% of the land area is undeveloped. The urban population has increased from 23.6% in 1960 to 65.6% in 1970. This compares to 63.1% in the State.

1970 POPULATION DISTRIBUTION

TOTAL POPULATION 111,102



Prince William County Planning Office

Plate 10

SOURCE: PLANNING OFFICE

TABLE 5

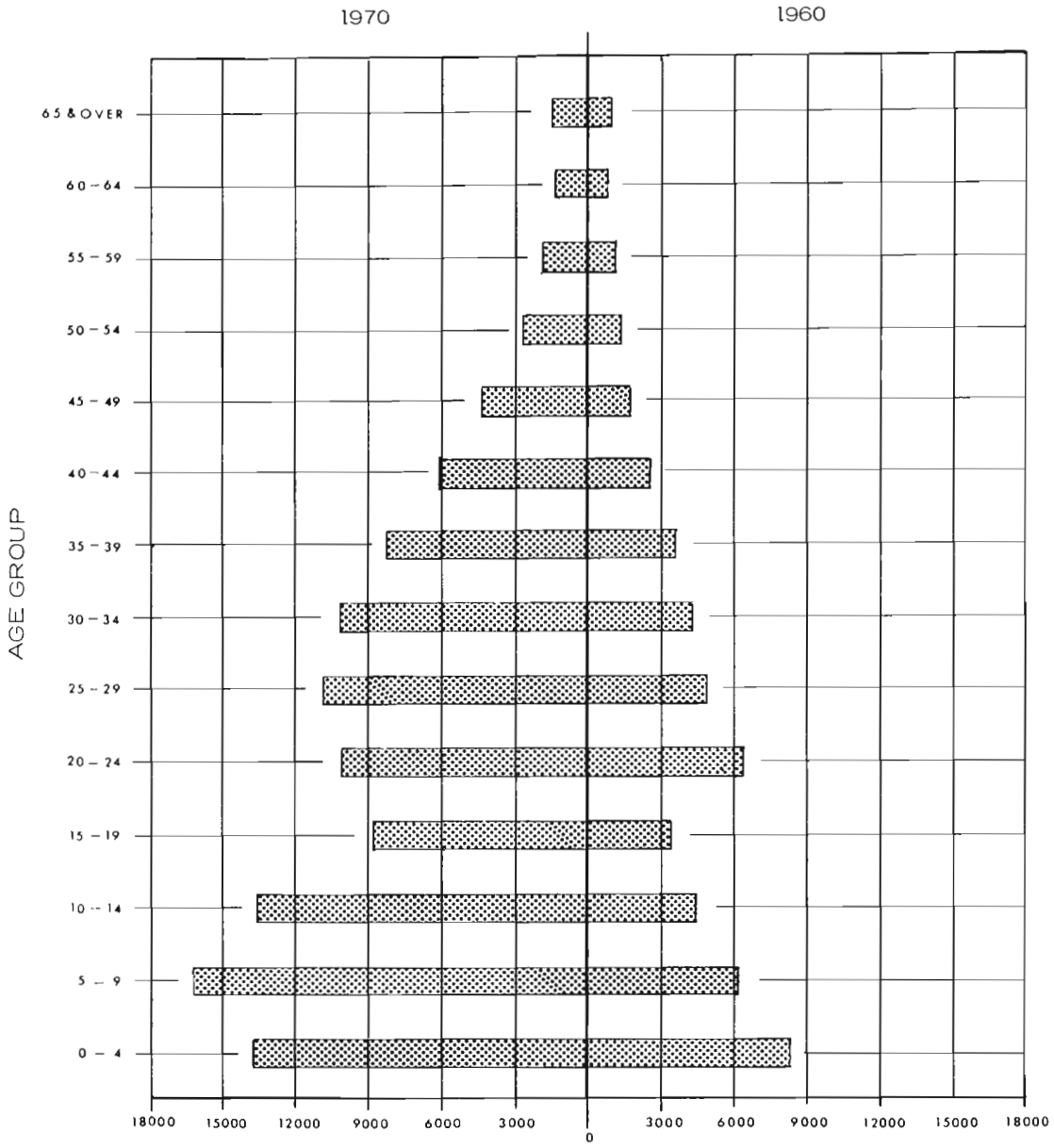
POPULATION OF INCORPORATED TOWNS AND UNINCORPORATED PLACES, 1940 - 1970

Town or Place	1940	1950	1960	1970	% Change 60 - 70
Haymarket Town	156	213	257	288	12.1
Lyman Park - Thomason Park(u)	N.A.	N.A.	N.A.	3,765	-
Manassas Park Town	0	0	5,342	6,844	28.1
Manassas Town (before annexation)	1,302	1,804	3,555	9,164	157.8
Occoquan Town	213	317	301	975	223.9
Quantico Station (u)	N.A.	N.A.	*N.A.	6,213	-
Quantico Town	1,139	1,240	1,015	719	-29.2
Triangle (u)	N.A.	N.A.	2,948	3,021	2.5
Woodbridge-Marumsco (u)	N.A.	N.A.	*N.A.	25,412	-
Yorkshire (u)	N.A.	N.A.	*N.A.	4,649	-
Dale City (u)	0	0	* 0	13,857	-
Dumfries Town	N.A.	N.A.	1,368	1,890	38.1
Total	-	-	-	76,815	-
Prince William County	17,738	22,612	50,164	111,102	121.5

* (u) = Unincorporated

Source: U.S. Census

TABLE 6: PRINCE WILLIAM COUNTY POPULATION BY AGE GROUPS



Source: U. S. Census

AGE AND SEX

The Prince William County age and sex profile resembles that of many other counties which are growing rapidly. Persons moving into the community are usually in their twenties and early thirties with children; hence the prominence of the under 14 groups and those in the 25 to 34 group. See Tables 6 and 7.

TABLE 7: AGE AND SEX DISTRIBUTION OF THE POPULATION PRINCE WILLIAM COUNTY, 1970

	Number		Percent	
Years	Male	Female	Male	Female
Under 5	6,909	6,867	6.2	6.2
5-9	8,311	7,807	7.5	7.0
10-14	6,988	6,571	6.3	5.9
15-19	4,649	4,122	4.2	3.7
20-24	5,412	4,683	4.9	4.2
25-34	10,364	10,701	9.3	9.6
35-44	7,741	6,652	7.0	6.0
45-54	3,781	3,364	3.4	3.0
55-59	1,031	939	.9	.9
60-64	696	746	.6	.7
65-74	728	940	.6	.9
over 75	407	693	.4	.6
Total	57,017	54,085	51.3	48.7

Source: U. S. Census

The high proportion of children under 14 and the high proportion of women of child-bearing age, promise a continued increase in Prince William's school population. They also promise a growing labor force and source of demand which may contribute to the County's economic growth. Note, however, the proportional decrease in the number of children under age 5, between 1960 and 1970.

RACE

In 1970 non-whites comprised 6 percent of the population of Prince William County, which was considerably under the national percentage of 12.0. As Table 8 shows, non-whites have declined as a percentage of the County's population, while increasing slowly in number. Over half of the increase in the number of non-whites during the 60's was attributable to in-migration.

TABLE 8: RACIAL COMPOSITION OF THE POPULATION, PRINCE WILLIAM COUNTY

	1930	1950	1960	1970
Total Population	13,951	22,612	50,164	111,102
Whites	11,413	19,921	46,032	104,438
Non-Whites	2,538	2,691	4,132	6,664
Non-Whites as Percent of Total:				
Prince William	18.2	11.9	9.0	5.99
Virginia	26.8	22.2	20.8	19.2
Washington SMSA	-	23.4	24.9	25.7
United States	11.2	10.5	11.4	12.0

Source: U. S. Bureau of the Census

TABLE 9: YEARS OF SCHOOL COMPLETED (By Persons 25 Years Old and Older)

Number of School Years Completed	Prince William Co. Number	Prince William Co. Percent	Fairfax Co. Percent	Loudoun Co. Percent	Virginia Percent
None	402	.8	.4	1.3	1.6
Elementary School					
1 to 4 years	1,166	2.4	1.1	5.2	6.0
5 to 7 years	4,148	8.5	4.3	16.2	17.0
8 years	3,079	6.3	4.0	5.8	7.6
High School					
1 to 3 years	8,299	17.0	11.4	16.8	20.0
4 years	19,196	39.3	31.4	30.2	25.2
College					
1 to 3 years	6,425	13.1	17.1	12.1	10.3
4 years	6,163	12.6	30.3	12.4	12.3
Total:	48,884	100.0	100.0	100.0	100.0
Median School Years Completed 1960	11.5		12.6	8.8	9.9
1970	12.4		12.9	12.2	11.7

Source: Bureau of the Census

EDUCATION

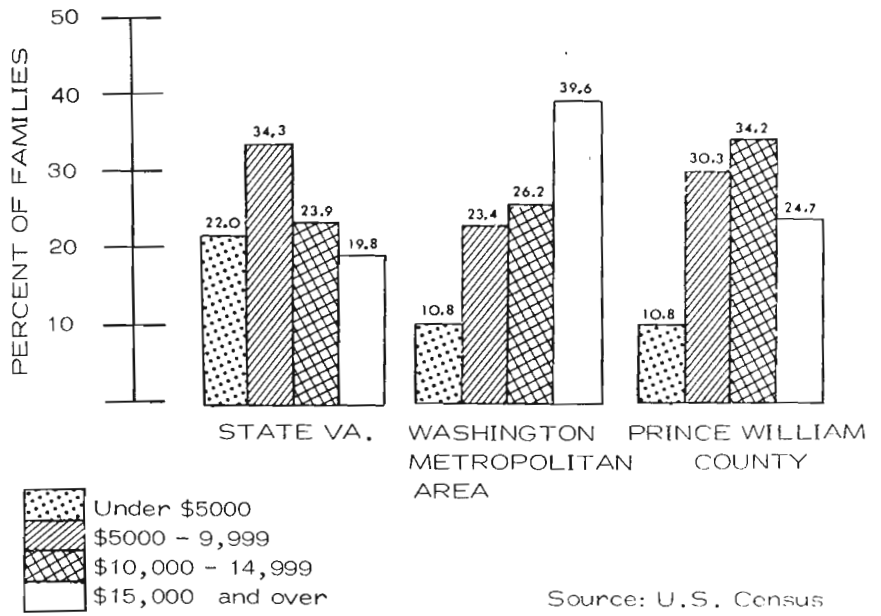
The general level of education in Prince William County is higher than that of the State as a whole. The County has about half a year edge on the State when comparing median school years completed (Table 9). Fairfax County has a higher median educational achievement at 12.9 years. The movement of young people in and out of these counties probably accounts for much of the differences among the counties. The older generation did not feel the need for as much education as does the generation now entering employment, many of whom are moving into Prince William County.

INCOMES

As measured by median income in 1969 of families living in the County in 1970, Prince William County at $11,205 is well above the state level of $9,049, and considerably below the Washington, D. C. metropolitan area of $12,933. The rate of increase of incomes during the 50's was higher than was that of the states and much higher than that of the Washington Area, however.

Table 10 shows the pattern of family income distribution in the County in 1970, as compared with the patterns in Virginia and the Washington Area. Table 11 shows that there are considerable differences in income levels among the jurisdictions which make up the Washington metropolitan area, and considerable differences in the rates of increase of these incomes.

TABLE 10
PATTERN OF FAMILY INCOME DISTRIBUTION, 1970



Source: U.S. Census

TABLE 11: COMPARATIVE MEDIAN FAMILY INCOMES, 1970

Jurisdiction	1959	1969	% Increase
Prince William	5,468	11,205	104.9
Fairfax County	8,607	15,707	82.5
Arlington County	8,670	13,743	58.5
Washington Area	7,577	12,933	70.7
Virginia	4,964	9,049	82.3

Source: U. S. Census

TABLE 13: CIVILIAN EMPLOYMENT BY INDUSTRY GROUP, 1960 AND 1970

Industry Group	1960 No.	1960 % of Total	1970 No.	1970 % of Total	Increase from 1960 to 1970 No.	Increase from 1960 to 1970 %
Agriculture, Forestry & Fisheries	655	5.5	525	1.6	-130	-19.8
Construction	1,574	13.1	4,383	13.1	2,809	178.5
Manufacturing	685	5.7	2,922	8.7	2,237	326.6
Transportation & Communications	677	5.5	1,854	5.5	1,177	165.0
Utilities & Sanitary Services	337	2.8	734	2.2	297	88.1
Retail Trade	1,948	16.2	5,296	15.8	3,348	171.9
Wholesale Trade	191	1.6	976	2.9	785	411.0
Finance, Insurance, Real Estate	361	3.0	1,515	4.5	1,154	319.7
Professional & Related Services	248	2.1	825	2.5	577	232.7
Business & Repair Services	423	3.5	1,404	4.2	981	231.9
Personal Services, Including Households	757	6.3	1,312	3.9	552	72.9
Educational Services	764	6.3	3,215	9.6	2,451	320.8
Public Administration	2,157	17.9	6,650	19.8	4,493	208.3
Other	1,248	10.4	1,922	5.7	674	54.0
Total	12,025	100.0	33,533	100.0	21,508	178.9

Source: U.S. Census

Economic Characteristics

Knowledge of the economy of the County and its probable development is valuable as background for planning. Knowing the sources of income of the population, the stability and growth prospects of the population may be estimated. Current and prospective manufacturing and commercial activity indicate trends in land uses and requirements, tax base, and utility and transportation needs.

EMPLOYMENT

Government, including federal and local government and the armed forces, employs an extraordinarily large share of the working population of Prince William County.

TABLE 12: EMPLOYMENT BY MAJOR CATEGORY, 1970

	Number	Percent
Agricultural Employment	316	0.7
Other Private Employment	21,877	51.7
Private Employment, Total	22,193	52.4
Government Employment, Civilian	11,340	26.8
Armed Forces	8,815	20.8
Government, Total	20,155	47.6
Total Employment	42,348	100.0

Source: U.S. Census

At 48%, this proportion exceeds that of the Washington metropolitan area (43%). The Quantico Marine Base and Ft. Belvoir account for most military government employment and also account for some of the civilian government employment. Except in the unlikely event of a base closing, this dependence on the government should tend to insure the insulation of Prince William County from any recessions of employment and income which the private and nonmilitary sectors of the national economy may experience.

Turning to civilian employment alone (Table 13, "public administration" is the leading field of employment. The major non-government sources of employment are "retail trade" and "construction". It is likely that the bulk of the "public administration" workers commute to jobs outside of the County. A comparison with statistics of employment within the County indicates that most persons employed in retailing and wholesale trade do not commute out of the County. Table 11 also indicates that the number of job holders living in the County almost tripled during the 60's, with the largest increases in real numbers occuring in public administration, retailing and construction.

In 1970, 805 persons were unemployed. This number comprised only 2.3 percent of the labor force (composed of those working or seeking work).

OCCUPATIONS

Prince William County's labor force (see Table 14) has a high proportion of craftsmen, foremen and operatives at 28.4 per cent of total employed civilians. This group includes construction workers, garage and service station workers, drivers and delivery men, as well as a few factory workers. By way of comparison, these groups comprise only 14.5 per cent of the occupations of employed civilians living in neighboring Fairfax County.

TABLE 14 OCCUPATIONS OF EMPLOYED CIVILIANS

Occupational Group	1960 No.	1960 % of Total	1970 No.	1970 % of Total	1960 - 1970 Increase or Decrease (-) No.	1960 - 1970 Increase or Decrease (-) %
Professional, Technical & Kindred Workers	1,346	11.2	6,582	19.6	5,236	389.0
Farmers & Farm Managers	310	2.6	115	.3	-195	-62.0
Managers, Officials & Proprietors (not farm)	840	7.0	3,080	9.2	2,240	266.7
Clerical & Kindred Workers	1,778	14.8	6,761	20.2	4,983	280.3
Salesworkers	673	5.6	2,015	6.0	1,342	199.4
Craftsmen, Foremen & Kindred Workers	2,292	19.1	6,371	19.0	4,079	178.0
Operative and Kindred Workers	1,351	11.2	3,155	9.4	1,804	133.5
Private Household Workers	421	3.5	374	1.1	-47	-11.2
Service Workers	954	7.9	3,585	10.7	2,631	275.8
Farm Laborers and Foremen	274	2.3	201	.6	-73	-26.6
Laborers, Exc. Farm	715	5.9	1,294	3.9	579	81.0
Occupations not reported	1,071	8.9			-1,071	-100.0
TOTAL	12,025	100.0	33,533	100.0	21,508	178.9

Source: U.S. Bureau of the Census

Professional, technical and kindred workers make up about 20 per cent of Prince William's employed civilians. In Fairfax County the percentage is about 30 per cent. This category is of growing relative importance in Prince William County, having more than quadrupled during the decade of the 60's. It appears to be the fastest growing category, with clerical workers, craftsmen, foremen, and operatives each increasing to between 3 and 4 times their 1960 levels.

The growth of the professional and clerical groups is in line with national and regional trends. The growth of the craftsmen and foremen groups reflects in part the increased construction activity in Prince William and neighboring counties and in part the availability of moderate cost housing in the County.

MANUFACTURING

There were 1,012 persons employed in manufacturing in Prince William County in April, 1970. While this is a low figure in relation to total employment it is nevertheless a considerable increase over preceding years, as shown in Table 15. It can be seen that the number of establishments has increased and that the new firms tend to be larger than the old ones.

The Manassas area currently has the most manufacturing activity, with steel fabricating, electrical machinery, electrical components, and clay products. In general, such manufacturing as there is had tended to locate near good transportation, with water and sewerage as additional considerations.

IBM, located in Manassas, has been a major addition to the manufacturing activity of the County.

Melpar, Inc., and Atlantic Research have establishments in the Manassas and Gainesville areas. While these are not manufacturing industries, it is not uncommon for research and development activities to convert into, give birth to or attract manufacturing.

With Route 95 and the proposed construction of sewer and water systems in the eastern end of the County, new possibilities of industrial, as well as residential, growth are opening. Route 66, west of Manassas, will be attractive to industry as sewer and water facilities become available. The County should do everything in its power to increase the employment and industrial base in this area.

Increased manufacturing activity would be desirable from many viewpoints, of which the real estate tax base is the most obvious. Manufacturing usually yields more in taxes to a community than it takes in services. Other effects are also important, though more subtle. With more of the working population employed within the County, it is probable that more retail and other family expenditures would be made within the County. Also, the location of a larger share of the county population's employment within the County would enhance feelings of loyalty and identity with the community.

TABLE 15: MANUFACTURING ESTABLISHMENTS AND EMPLOYMENT IN PRINCE WILLIAM COUNTY

Year (April)	Number of Establishments	Employment
1947	14	115
1950	15	164
1953	17	172
1956	15	195
1959	22	256
1962	26	432
1970	29	1,012

Source: U.S. Bureau of the Census, County Business Patterns. Figures are based on social security tax returns.

Prince William County's riverfront is also a feature which might be developed to attract heavy industries such as petroleum or chemicals, storage and processing, which can use water transportation and should be located at some distance from residential area.

With the improvement of highway transportation, industry has a tremendous choice of location. The County can truly represent itself as an ideal plant location.

RETAILING

Retailing in Prince William County is the second largest source of employment of the county's work force. It is also important to the tax base. An adequate assortment of easily accessible retail outlets is an advantage to any community which wishes to attract desirable new residents and industries.

Prince William County retailing works under two main handicaps: the large proportion (48%) of the work force which works outside the County, and the relatively low population density. Commuters by auto tend to combine shopping trips with work trips, and to be at least as familiar with shopping facilities near their places of work as with those near home. A low population density causes a low inventory turnover and uneconomic operation for stores which sell seldom-purchased items, such as appliance and furniture stores. Low densities will not support the varied inventory of a good department store. A shortage of such stores reduces the variety and attractiveness of shopping areas and adversely affects the sales of other stores.

OTHER ACTIVITIES

The list of occupations in Table 14 includes a bit of everything. For the most part, those not discussed above are currently of little importance and, for some time, they may be expected to grow in step with the population. On the other hand, finance, insurance and real estate and business, professional and related services may be expected to increase more rapidly than other activities. As the community grows it should become, economically, a more varied and complete community.

CONCLUSIONS AND OUTLOOK

The Quantico Marine Base and other Federal government agencies are the industries which are basic to growth in Prince William County. We may expect the former to remain stable for some decades. Federal civilian employment in the Washington area is expected to increase by 1980. The other basic employment categories are manufacturing, research and development, and some of the electric power industry. These are of little importance now in Prince William County and their growth is very difficult to predict, although we may confidently expect some growth.

A continuation of the current decline in agriculture is reasonably certain. Retail trade and business services may be expected to increase in volume and employment more rapidly than other lines, and more rapidly than the population.

As background for planning, this economic analysis means several things.

1. An increasing population supported by a varied economic base will require increasing addition to the facilities necessary for urban living. Land services with utilities will be necessary for medium and low cost housing of varied types for medium and low income groups. Of the two groups, the medium income group is increasing more rapidly.

2. Reservation of recreational areas will be necessary for an increasing population supported by varied occupations.

3. In order to compete better with shopping facilities near places of work outside the County, an effort should be made to consolidate shopping facilities in the County in centers where each facility may build upon the strength of others to offer greater selection and variety and thus, to encourage spending in the County of an increasing proportion of the income of county residents.

4. Provisions should be made for a moderate amount of industrial land, generally for light industry, with careful control and protection of surrounding residential areas. In addition, provisions should be made for the possibility of heavy industry, and this involves decisions regarding future use of the river front where both rail and water transportation are available. This decision must be made with careful consideration of the recreational potential of the same land.

Housing Characteristics

Existing Housing Stock

Reflecting its enormous population growth in the past two decades, more than eighty percent of the housing stock of Prince William County has been built since 1950. Between 1960 and 1970, Prince William County's supply of housing more than doubled. Table 16 summarizes the number of housing units in Prince William County in 1960 and 1970. In order to give a more detailed description of housing activity between 1960 and 1971, Table 17 lists the number of building permits issued yearly in Prince William County from 1960-72. From Table 17, one can see that construction of single family homes has dominated Prince William County's housing market. However, Table 17 makes clear that in recent years, higher proportions of townhouse units and apartment units are being built. As land costs continue to rise and as tastes change, it is expected that these trends will continue. Although 1972 shows a decline from 1971 totals, the total number of units is significantly above prior years.

TABLE 16: HOUSING UNITS IN PRINCE WILLIAM COUNTY, 1960 and 1970

	1960	1970
Total Housing Units	13,207	29,885
Occupied Units	11,893	27,760
Vacant Units	1,314	2,125
Percent Vacant	9.9%	7.1%
Detached and Townhouse Units	10,057	23,285
Units in Multi-unit Structures	2,275	5,266
Mobile Home Units	875	1,321
Seasonal Units	N.A.	13

Source: U. S. Census of Housing, 1960 and 1970

Selected Housing Characteristics

The 1970 Census revealed that 18,526 of Prince William County's housing units were occupied by owners and 9,652 units were renter occupied. As shown in Table 18, the 1970 median value of owner occupied housing units in the County was $23,800. The median contract rent in renter occupied units was $129.00 per month, as illustrated in Table 19. Prince William County's 1970 median value for owner occupied housing units was the lowest median value of all Northern Virginia Counties. In terms of median contract rent, Prince William had the second lowest figure of all Northern Virginia Counties in 1970.

TABLE 17: BUILDING PERMITS ISSUED, 1960-1971

PRINCE WILLIAM COUNTY

Year	SF	TH	APTS	Totals
1960	1,168	0	0	1,168
1961	575	0	24	599
1962	948	13	308	1,269
1963	1,131	226	530	1,887
1964	1,665	148	1,128	2,941
1965	1,766	207	407	2,380
1966	702	458	401	1,561
1967	888	289	297	1,474
1968	1,466	489	147	2,102
1969	1,811	616	144	2,571
1970	1,313	736	624	2,673
1971	2,016	1,348	771	4,135
1972	1,914	1,335	591	3,740

Source: Planning Office, Prince William County, based on data collected from the County Public Works Department and the Town of Manassas Zoning Office.

In 1970, Prince William County had the highest population per owner occupied unit (average household size) as well as the highest population per rental units of all Northern Virginia Counties. Statistics on median values of owner occupied units, median values of rental units, and average household size for Prince William County and other Washington metropolitan jurisdictions are found in Table 20.

Currently, the median value of new owner occupied units in Prince William County is well above the 1970 median value for all housing units. According to recent Federal Housing Administration survey, the median value of a new house in Prince William County as of January, 1971 was $29,534. According to the same source, a year later the median value of a new house in Prince William County rose to $32,218. This figure was still well below the median price of $35,513 for a new home in the entire Metropolitan Washington Area as of January, 1972. It is interesting to note that the figure for the Metropolitan Washington area for 1972 was more than $10,000 higher than the national median value for owner occupied ($24,800).

Existing Housing Conditions

In 1970, 1,542 or 5% of all housing units in Prince William County lacked complete plumbing facilities. This was 663 units less than the 2,175 housing units which lacked such facilities in 1960. According to the 1970 census, 598 rental units and 644 owner occupied units lacked some plumbing facilities. According to estimates made by the Metropolitan Washington Council of Governments, 1,756 housing units or 5.9% of all housing units in Prince William County were in need of replacement, and 673 housing units (2.3%) were in need of repairs. Between 1960 and 1970, Prince William County had the greatest percentage increase (26%) in the number of overcrowded units of any jurisdiction in the Washington Metropolitan area. Here, overcrowding is defined as housing units with more than one person per room. Specifically, Prince William County had an increase between 1960 and 1970 of 505 overcrowded units. The housing staff of the Council of Governments has attributed this high percentage of overcrowded units to the fact that Prince William County lacks any minimum housing regulations and enforcement procedures. Prince William County is one of three jurisdictions in the Metropolitan area which lacks a minimum housing code.

TABLE 18

FINANCIAL VALUE OF OWNER OCCUPIED HOUSING UNITS IN
PRINCE WILLIAM COUNTY
1960 and 1970

Value	1960 Number	1960 Percentage	1970 Number	1970 Percentage
Less than $5,000	481	8.6	142	.9
$5,000 to $7,499	539	9.7	181	1.1
$7,500 to $9,999	1,149	20.6	230	1.4
$10,000 to $12,499	885	15.8	525	3.2
$12,500 to $14,999	936	16.8	661	4.0
$15,000 to $17,499	880	15.8	890	5.4
$17,500 to $19,999	326	5.8	1,532	9.4
$20,000 to $24,999	258	4.6	5,283	32.3
$25,000 to $34,999	80	1.4	5,267	32.2
$35,000 or more	46	.8	1,626	10.0
TOTAL	5,580	100%	16,337	100%
Median Value	$11,800		$23,800	

Source: U. S. Census of Housing, 1960 and 1970

TABLE 19: CONTRACT RENT FOR RENTER OCCUPIED HOUSING UNITS IN PRINCE WILLIAM COUNTY, 1960 and 1970

Contract Rent	1960 Number	1960 Percentage	1970 Number	1970 Percentage
Less than $30	118	2.6	134	1.5
$30 to $39	123	2.7	50	.6
$40 to $59	416	9.1	266	3.0
$60 to $79	1,026	22.4	574	6.5
$80 to $99	1,372	30.0	758	8.6
$100 to $119	614	13.4	1,187	13.4
$120 or more	646	14.1	4,340	48.9
No Cash Rent	261	5.7	1,556	17.5
TOTAL	4,576	100%	8,865	100%
Median Rent	$88		$129	

Source: U. S. Census of Housing, 1960 and 1970

TABLE 20: SELECTED HOUSING CHARACTERISTICS OF WASHINGTON METROPOLITAN JURISDICTIONS 1970*

Jurisdiction	Owner Occupied Units		Rental Units	
	Median Value	Population Per Unit	Median Contract Rent	Population Per Unit
Prince William	$23,800	4.0	$129	3.6
Arlington	29,500	3.1	140	2.1
Fairfax County	35,400	3.8	164	3.0
Loudoun	25,600	3.5	105	3.5
District of Columbia	21,400	3.3	111	2.5
Montgomery, Md.	32,900	3.7	165	2.6
Prince George, Md.	23,800	3.8	143	2.8

*Data for Manassas and Manassas Park not included in source data.

Source: 1970 Census of Housing, U. S. Dept. of Commerce, February, 1971

SUBSIDIZED HOUSING PROGRAMS IN PRINCE WILLIAM COUNTY

Prince William County has no Public Housing Authority, and therefore has no federally subsidized public housing projects sponsored by the County. However, there are currently a number of federally subsidized housing projects in Prince William County. These subsidized housing projects are being developed by private, non-profit or limited dividend developers. Table 1 provides a summary of the federally subsidized housing within Prince William County.

As can be seen from Table 21, federally subsidized housing within Prince William County is being developed through three different federal programs, all administered by the Department of Housing and Urban Development. The three Federal programs utilized within Prince William County are the 221 (d) (3) program, the 236 program, and the 235 program.

Approval of these subsidy programs by the Board of County Supervisors is not required and has never been sought by the developers of these projects. The County does, however, have an opportunity to comment on applications by developers during the "A-95 Review" process. The"A-95 Review"procedures require a report on each application by the Northern Virginia Planning District Commission, the Washington Metropolitan Council of Governments and State of Virginia (Division of State Planning and Community Affairs).

Besides the 986 subsidized units already either occupied or under construction in Prince William County, application has been made to H.U.D. for a 70 unit 236 project in Triangle called Pinewood Gardens. H.U.D. has taken no action on this proposal. Currently, this proposal is caught up in the current housing moratorium on all housing subsidy programs recently announced by the Department of Housing and Urban Development. The attached article from the Washington Star-News describes this situation.

How Can Local Subsidy Programs be Aimed at Prince William County Residents?

Advertising in local newspapers should help to ensure that local residents will be given a chance to occupy the subsidized units. Another way that low income residents within Prince William County might become aware of the subsidized units is if the Department of Social Services keeps track of subsidized housing and notifies qualifying families. Unfortunately, there are families in Prince William County with such low incomes that only a County-sponsored public housing program would be applicable. Fauquier County is attempting to solve some of its housing problems through its Community Action Program.

Fair Share Formula for Metropolitan Washington

The Washington Metropolitan Council of Governments has also adopted a "Fair Share Formula" for the Metropolitan Washington Area. Essentially, the Council of Governments has advocated spreading low and moderate income housing units throughout the Metropolitan area, rather than concentrating these units in a few geographical areas. Based on an involved formula, the Fair Share Formula has advocated that 0.2% of all regionally subsidized housing units be located in Prince William County.

As of October 1971, Prince William County already had 2.2% of all subsidized housing units within the Washington Metropolitan Area. Because of the Fair Share formula and the fact that Prince William is already ahead of its proposed allocation, it is not expected that the Federal Government will advocate increasing the amount of subsidized housing units within Prince William County in the near future. This is buttressed by the fact that FHA also has a policy of not concentrating subsidized housing units within one geographical area. Several applications to FHA for subsidized housing units within Prince William County have already been turned down by FHA.

TABLE 21: FEDERALLY SUBSIDIZED HOUSING - PRINCE WILLIAM COUNTY

1972

Project Name Address	No. of Units	Federal Program [1]	Status
Woodmark Rt. 1 & Woodmark Drive Triangle	150	236	Occupied
Scattered Sites	73	235	Occupied
Woodbridge Apartments Rt. 1 & Bel Air Road Woodbridge	209	236	Occupied and Under Construction
Coverstone Apartments Rt. 234 Manassas	204	236	Under Construction
Manassas Park Townhouses Rt. 615 & Centerville Road	166	236	Under Construction
Chesapeake Apartments U.S. Rt. 1 & Possum Point Road Triangle	184	221-d-3	Under Construction
TOTAL UNITS	986		

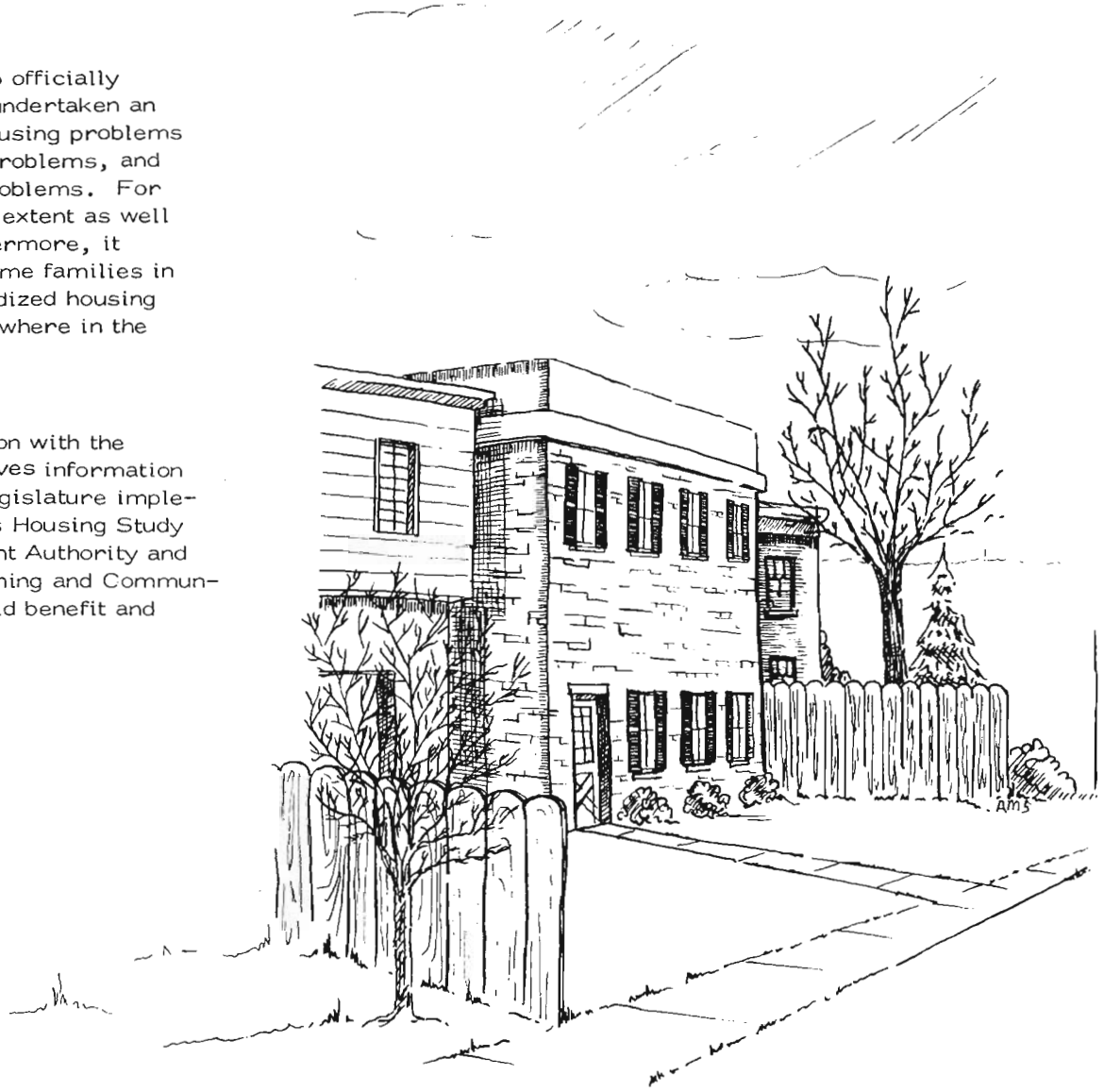
[1] Federal Programs:

221-d-3: Interest subsidy on owner's mortgage (permitting lower rents).
235: Interest subsidy for home mortgages, usually detached homes & townhouses.
236: Interest subsidy on owner's mortgage (permitting lower rents).

Source: Housing Division, Council of Governments

Presently, Prince William County has no officially adopted Housing Plan. The County has never undertaken an in depth housing study to determine what its housing problems are, what obstacles hinder overcoming these problems, and what strategies are optimal to solving these problems. For example, an in depth study could ascertain the extent as well as the location of substandard housing. Furthermore, it could ascertain whether low and moderate income families in the County were actually benefiting from subsidized housing programs. Likewise, it could also determine where in the County subsidized housing is most needed.

From Prince William County's association with the Metropolitan Council of Governments, it receives information and data on Housing. Recently the Virginia Legislature implemented the recommendations of the Governor's Housing Study Commission and created a Housing Development Authority and an Office of Housing in the Department of Planning and Community Development. Prince William County should benefit and utilize all of these resources.



Major Thoroughfares

The thoroughfare is in many respects the framework or skeleton upon which the body of the plan must develop. The lack of an adequate transportation system is one of the most important problems affecting development in Prince William County. The recent surge of residential, commercial and industrial development has brought about an unprecedented demand for efficient movement of people and things.

The interrelationships between land use and transportation supply and demand comprise the basic issues of the transportation planning process. Transportation facilities themselves affect land uses and, in turn, are vitally affected by land uses. A complete feedback process for land uses and transportation facilities is vital to the planning process.

In an area which is growing as rapidly as Prince William County, the transportation planning process can become very complex. Sophisticated methods, large volumes of data, complicated computer models, evaluation of multiple alternatives, and plenty of time and money are required for highly quantified and precise transportation planning. While all of these resources are not available in Prince William County at this time, sufficient information and planning experience exists for the purposes of this general plan.

Transportation planning for Prince William County must be carried out on a county-wide basis. It must be sufficiently long-range to assure that the County's future transportation needs will be met. It must be concerned with the County's present needs so that immediate action will be taken where it is needed most. Finally, it must be a continuous process so that changing conditions can be dealt with as they arise.

Existing Planning For Major Thoroughfares

Planning for major thoroughfares in Prince William County has been carried out mainly as part of the preparation of plans that have been adopted for the Planning Areas of Manassas, Woodbridge, Dale City, Occoquan and Powells. Each of these plans contains a section on major thoroughfares. Although never adopted by the Board of Supervisors, the County Comprehensive Plan of 1964 and the Northern Virginia Transportation Needs Study of 1968 also contained important proposals for major thoroughfares.

Planning for major thoroughfares has been developed on a county-wide basis through the cooperative efforts of the County's planning staff and the Virginia Department of Highways' Metropolitan Planning Section. A number of proposals for new roads and up-grading existing roads have been prepared. These proposals, known as "functional plans", provide more detail for the thoroughfare plans in each planning area. Several of them set forth proposed revisions to the area thoroughfare plans. Others propose major thoroughfares in parts of the County not now included in any adopted planning area study.

Transportation planning is conducted on a regional basis by the Transportation Planning Board of the Metropolitan Washington Council of Governments. Largely because Prince William County is located on the fringe of the metropolitan area, and partly because the County has not initiated a detailed transportation planning program of its own, the Council of Governments has contributed little to major thoroughfare planning in the County. A number of proposals important to the County have been brought forth, however, such as the Outer Beltway, the Monticello Freeway, commuter bus service and commuter rail service. The County Planning Office is represented on the technical committee of the COG Transportation Planning Board.

The Planning staff has maintained contact with the Fairfax County Division of Planning with respect to the planned thoroughfares which may link the two counties in the future. The staff also is in periodic contact with the U.S. Department of the Interior, which is the agency responsible for the George Washington Parkway and its proposed extension through eastern Prince William County.

The planning area studies, the 1964 Comprehensive Plan, the 1968 Thoroughfare Plan and the work of the Council of Governments document the need for an improved system of major thoroughfares. Traffic counts during recent years reveal a rapidly increasing demand for efficient movement of people and things. The traffic projects made by the Virginia Department of Highways (VDH) for various portions of the proposed highway network in the County substantiate the need for new or expanded thoroughfares in the future.

Roadway Classifications

For the purposes of this general plan, a road classification system has been developed according to Table 22. These specifications conform to current standards of the Virginia Department of Highways. Roads with shoulders rather than curbs and gutters are generally constructed in rural areas or in very low density subdivisions. Curbs and gutters are generally utilized in developed areas.

The provision of access to abutting property and to other streets is of critical importance to the function of a roadway. In numerous cases in the history of thoroughfare planning and construction, the very roads which initially provided good access to newly developing areas often became so congested that their value as a high capacity carrier was eliminated. Although traffic volume is certainly related to road capacity, the amount of direct access permitted along a thoroughfare can be the most damaging factor in causing traffic congestion.

Control of access varies with the street's function in the following manner:

Local Street: Provides access to home sites and intersects other local streets and thoroughfares. Designed for local traffic only, with no through traffic.

Collector Street: Provides access to home sites, elementary schools and minor business areas. Serves as collector for local street traffic. Intersects local streets, thoroughfares and some arterial roads.

Thoroughfare Street: In rural areas, this type of street provides for medium speed, through movement and for direct access to abutting properties. Although two lanes are sufficient in rural areas, four lanes (undivided) are necessary in developed areas, due to slower speeds, the increased friction with abutting properties, and more frequent intersections. Thoroughfares may provide direct access to schools, commercial areas and residential areas. They serve as connectors to arterial roads and as collectors of traffic from lesser streets. Important intersections may require channelization and signalization.

Arterial Road: Arterials provide access to major commercial or industrial uses, large schools and other major community facilities. Ideally, no direct access is permitted to individual residences. Median breaks are ideally at least 600 feet apart. Arterials usually provide for medium speed travel through developed areas and high speed travel in rural areas. Intersections should be well spaced with signalization and channelization where needed. Service drives may be required in urbanized areas to provide for movement of traffic through congested areas.

Expressway: A high speed, high capacity limited access highway with grade separations at intersections and no direct access to abutting properties. An expressway is usually a continuous route for regional movement and is not intended for strictly local use.

This plan is concerned mainly with the three largest types of roads: thoroughfares, arterials and expressways.

Commuter Transit Facilities

Almost one-half of the Prince William County work force is employed outside of the County. Many of these persons work in core areas of the metropolitan area. For this reason, commuter transit facilities may be feasible in several parts of the County.

TABLE 22

GENERAL ROADWAY CLASSIFICATIONS

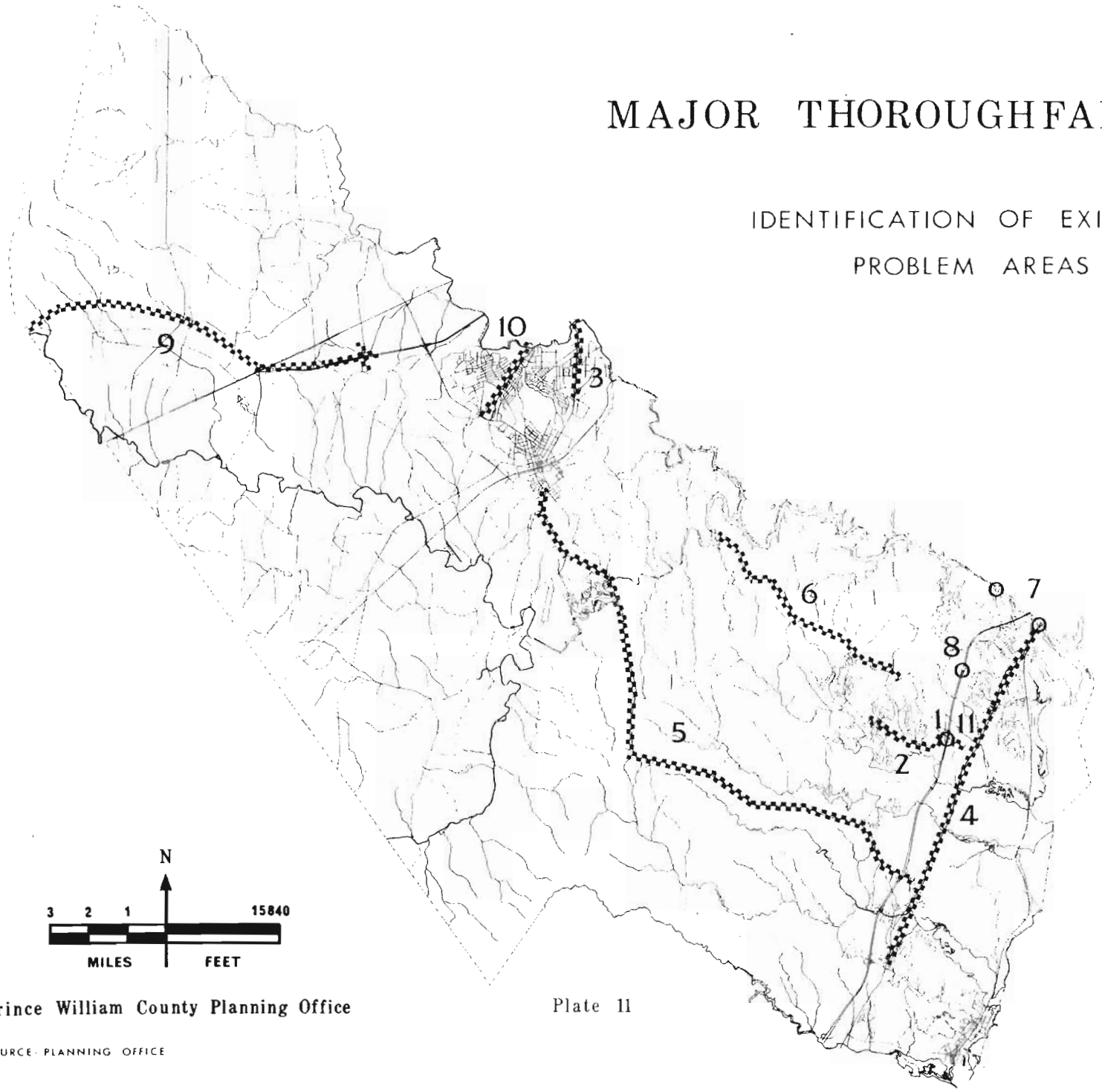
Class	Anticipated V.P.D.	Divided or Undivided	Curbs or Shoulders	Travel Lane Width	No. of Travel Lanes	Parking Allowed	Parking Lane Width	Pavement Width	Desired R.O.W.
Local Street	0 to 400	Undivided	Shoulders	10'	2	No	-	20'	52'
			Curbs	10'	2	Yes	8'	30'	52'
Collector Street	401 to 3,000	Undivided	Shoulders	11'	2	No	-	22'	60'
			Curbs	12'	2	Yes	10'	44'	60'
Thorough-fare	3,000 to 5,500	Undivided	Shoulders	12'	2	No	-	24'	64'
			Curbs	12'	4	No*	-	48'*	64'*
Arterial Road	5,501 to 30,000	Divided (With service drives if needed)	Shoulders	12'	4	No	-	48'	110' - 200'
			Curbs	12'	4 - 6	No	-	48' - 72'	90' - 200'
Express-way	25,000 and up	Divided	Shoulders	12'	4 - 6	No	-	48' - 72'	300' or more

* Parking under certain conditions may be permitted, but will require additional right of way and pavement.

V.P.D. = Vehicle trips per day

MAJOR THOROUGHFARES

IDENTIFICATION OF EXISTING PROBLEM AREAS



Prince William County Planning Office

Plate 11

SOURCE: PLANNING OFFICE

Commuter bus service has already been established in Prince William County, most notably in Dale City, from which over 25 round trips are made daily to employment centers. Expansion of this service to include other developed areas, including new routes, shelters, terminals, and commuter parking facilities should be studied.

Identification of Existing Problem Areas

Prince William County, like all urbanizing areas, has many problem areas and points of congestion along its present thoroughfares. The following are the major problem areas that lend themselves to solution through a middlerange planning process. While issues such as speed limits and signalization are important, the problem areas identified below are those that require major improvements, changes and additions to the major thoroughfare system in the County. The numbered items below are shown on Plate 11.

1. Dale City Interchange Area. This interchange and the nearby intersection of Route 642 and Dale Boulevard have become extremely congested during the morning and afternoon rush hours, causing lengthy delays and dangerous conditions, and are heavily used throughout the day.

2. Dale Boulevard, between Route 642 and Forestdale Avenue. This facility, presently a two lane thoroughfare is carrying traffic which far exceeds safe limits and tolerable levels of service. This is especially true during peak hours at intersections and near Ashdale Plaza Shopping Center.

3. Route 28, from Manassas Drive to Fairfax County line. Traffic counts and accident records indicate that this road requires additional lanes, channelization at major intersections, and a median strip to cut down on left turn movements to and from travel lanes.

4. Route 1, from Route 234 to Fairfax County line, and intersecting streets. Although traffic lights and speed controls have been helpful, traffic counts and accident records indicate the need for a median strip, turning lanes at major intersections and improved control of access from abutting properties. Major intersecting streets such as Smoketown Road, Featherstone Road, Longview Drive, Mount Pleasant Drive and Occoquan Road, require additional channelization and turning lanes where they intersect Route 1.

5. Route 234, from Manassas to Dumfries. This is the only primary route between the County's two developed areas. As a two lane thoroughfare, it does not provide the level of service necessary for the wide variety of vehicles that make use of it.

6. Davis Ford Road (Routes 663 and 642), from Occoquan Bridge to Route 640. This facility is a narrow, two lane secondary road with numerous sharp curves and steep grades. Presently being used beyond safe capacity, its improvement to rural thoroughfare standards would provide a thoroughfare link between Manassas and the Woodbridge Dale City area.

7. Route 1 and Route 123 Bridges over Occoquan River. These two bridges were victims of Hurricane Agnes. New bridges are already under way.

In assessing the existing situation, mention should be made of the totally new facilities that would serve existing as well as future needs. The major facilities that fall into this category are as follows:

8. New Interchange on I-95 at Horner Road, with related improvements to Horner Road and connection to Longview Drive. This would alter traffic patterns and relieve congestion on existing interchanges.

9. Extension of I-66 westward to Fauquier County line and addition of new interchanges for industrial areas near Wellington and Gainesville. These facilities will reduce traffic on Route 55 through Haymarket and provide for needed industrial access.

10. Route 28 By-pass and related improvements from Route 234 to I-66 near Centreville in Fairfax County. This facility will reduce through traffic on existing Routes 28 and 234 and provide additional access to I-66.

11. New connecting road between Dale City interchange on I-95 and Route 1, with related access road to the Potomac Hospital.

Who Builds Roads?

Major thoroughfares are built and paid for in several ways, as summarized below:

Secondary Road Funds. Each year, the Virginia Department of Highways (VDH) allocates funds for secondary roads in Prince William County. Secondary roads are essentially all roads with route numbers beginning with 600 and higher. The secondary road fund is administered by the local VDH Resident Engineer, who must use the funds for maintenance of the existing secondary road system as well as for new construction.

Primary Road Funds. The VDH allocates primary road money to each District Office. Prince William County is part of the Culpeper District, along with the other jurisdictions in northern Virginia. Primary roads in Prince William County are Routes 1, 15, 28, 29-211, 123, 215 and 234. Criteria have been established that require a road to serve significant volumes of general through traffic before it may be defined as a primary route. Dale Boulevard was evaluated recently and did not meet all of these criteria.

Interstate Highways. The interstate system is built and maintained largely by Federal funds administered by the Federal Highway Administration, working through the Virginia Department of Highways.

Industrial Access Roads. Several roads in Prince William County, such as a portion of Balls Ford Road, have been constructed or improved with funds from this state source. The funding decision depends upon the size of the industry and amount of funds available, which appear limited.

County Funds. Prince William County, although not responsible generally for any road construction or maintenance, has from time to time expended money on road construction and right of way acquisition, where the County's best interests are clearly involved and where no other funds are available. Recent examples of these expenditures include new Route 661 between Route 234 and the IBM Plant, the gravel access road to the Potomac Hospital from the Dale City interchange area, and the improvement of several small residential roads so that they could be taken into the secondary road system and maintained by the state rather than by the residents using them.

Developers. Developers of large parcels of land must be expected to construct all roads necessary to serve the properties that they are developing. Examples of major roads built through this means are Sudley Manor Drive, Dale Boulevard and Old Bridge Road in the Lake Ridge Community.

Sewage Facilities

Central and Western Prince William County

Sewage treatment facilities within Prince William County are presently provided by either sanitary districts, towns, the Federal Government or private corporations. Within the western sector of Prince William County, sewage treatment is provided by the Greater Manassas Sanitary District and the Towns of Manassas and Manassas Park. Two other sanitary districts exist in western Prince William County, the Gainesville-Hyamarket Sanitary District and the Yorkshire Sanitary District. A third district, the Nokesville Sanitary District, is proposed. A generalized picture of the areas covered is shown on Plate 12.

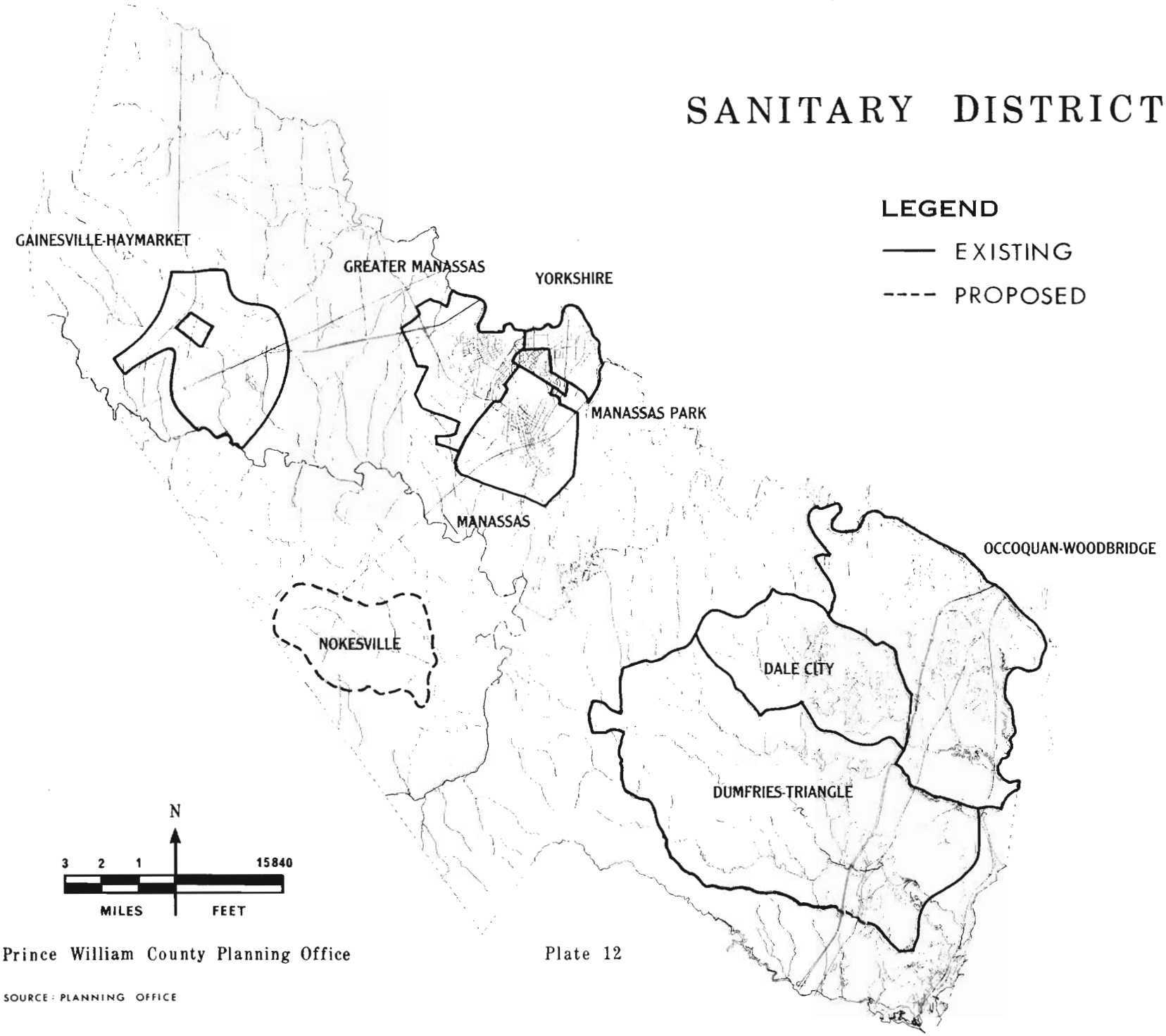
The proposed Nokesville Sanitary District has approximately 10,000 feet of sewer lines within its proposed boundaries and two package treatment plants. These sewer lines and plants serve a small number of private users, the Nokesville Elementary School and the Brentsville District High School. The Gainesville-Haymarket Sanitary District has approximately 8,000 feet of sewer lines. These lines serve the Tyler and Gainesville Elementary Schools. The sewage is collected in the lines and then trucked to the Greater Manassas Sanitary District Treatment Plant. Within the Gainesville-Haymarket Sanitary District there is also a privately owned water and sewage franchise, serving Lakeview Estates Subdivision. This package plant, as well as all other package treatment plants currently operating within Prince William, is listed at the end of this section. The Yorkshire Sanitary District currently has approximately 3,000 feet of sewer lines. This Sanitary District passed a bond referendum in the fall of 1971 in order to raise funds to provide sewer lines to approximately 900 households within its boundaries. Currently, the sewer lines in the Yorkshire Sanitary District run into the Greater Manassas Sanitary District treatment plant.

Most of the western half of Prince William County lies within the Occoquan Watershed. Due to the problem of increasing pollution of the streams which drain into the Occoquan Reservoir, the State Water Control Board (S.W.C.B.), in July, 1971, adopted the "Occoquan Watershed Policy". As a result of this policy, stringent regulations have been placed on the expansion of sewage services in the Occoquan Watershed. The Occoquan Watershed Policy calls for a regional sewage collection system and an advanced regional treatment plant with the elimination of existing treatment plants within the Occoquan Watershed.

To implement the Occoquan Watershed Policy, the S.W.C.B. recommended that a single political entity be formed. This has resulted in the formation of the Upper Occoquan Sewage Authority. This Authority is comprised of two members from four political jurisdictions which lie within the Occoquan Watershed. They are the counties of Prince William and Fairfax and the Towns of Manassas and Manassas Park. Currently, the governing bodies of all four member jurisdictions have signed the service agreements which will allow for the construction of the regional treatment plant and the first phase of laying the large interceptor lines which will carry the sewage to the new regional plant.

As mentioned earlier, the Occoquan Watershed Policy initially calls for one regional treatment plant and the phasing out of all existing treatment plants within the Occoquan Watershed. The S.W.C.B. has stated that any interim expansion of existing plants must be made with the understanding that they will be phased out when the regional plant becomes operational. Because of the tremendous growth expected in the central portion of Prince William County, interim plans for expansion of existing sewage treatment facilities have been made. These plans for expansion, as well as certified capacities for the existing six major treatment plants in the western part of Prince William County are enumerated as follows.

SANITARY DISTRICTS



Prince William County Planning Office

Plate 12

SOURCE: PLANNING OFFICE

A. Town of Manassas

Northside Plant

This is a conventional trickling filter plant followed by an aerated lagoon. A parallel contact aeration plant, although not used, is also installed. The trickling filter plant is certified for a flow of 0.6 m.g.d. (million gallons per day) and the contact aeration plant for 0.3 m.g.d. As of September, 1971, the 12 month average flow to the trickling filter plant was .84 m.g.d. An interim plan submitted to the S.W.C.B. in September 1971 called for a population equivalent of 2,100 people to be transferred from the Northside Plant to the Liberia Plant. Plans call for an interim expansion of approximately 400,000 gallons or approximately 1,000 sewer connections. This expansion is scheduled to be completed by July, 1973.

Liberia Plant

This is a Griffith contact aeration plant followed by a 5 million gallon holding pond. The plant is certified for .338 m.g.d. The six month average flow rate, as of September 1971, was.054 m.g.d. The Town plans to upgrade the Liberia plant through the process of phosphorus removal. This is to be achieved by injection of chemicals into the waste water at the effluent end of the second stage aeration basis with clarification in the existing final clarifer.

B. Town of Manassas Park

The town is served by two plants utilizing the Griffith contact aeration process. Each plant has a certified capacity of .344 m.g.d. Data collected in the fall of 1970 showed the average flow to be .169 m.g.d. to Plant No. 1 and .302 m.g.d. to Plant No. 2. No expansion of either Plant 1 or Plant 2 is planned.

C. Upper Occoquan Sewer Authority Programmed Facility

As previously stated, the Occoquan Watershed Policy advocates that initially one regional treatment plant be constructed to replace all existing sewage treatment facilities within the Upper Occoquan Watershed. Initially, the State Water Control Board has stated that the maximum allowable upper limit for the initial certified flow capacity for the plant will be 10.9 million gallons per day. The 10.9 m.g.d. has been divided in the following manner.

Regional Plant at 10.9 M.G.D.

Fairfax County	3.36 M.G.D.
Prince William County	3.6 M.G.D. Pr. Wm. Co.
	1.63 M.G.D. Manassas Park
	2.31 M.G.D. Town of Manassas
	7.54 M.G.D.
Regional Plant Total:	10.90 M.G.D.

Plans now call for the regional treatment plant to be operational by the first quarter of 1975. The S.W.C.B. has stated that upon one years successful operation of the treatment plant at 10.9 m.g.d., the U.O.S.A. may expand the plant to 15 m.g.d. The decision of whether to expand the plant from 10 m.g.d. to 15 m.g.d. must be agreed upon by the members of the U.O.S.A. with the approval of each of the four governing bodies of the member jurisdictions. If the plant were expanded to 15 m.g.d., the S.W.C.B. has allocated the 15 m.g.d. in the following manner. The 15 m.g.d. allotments are broken down into two alternatives. Case 1 reflects the maximum allowable to Fairfax County under the State Water Control Board Occoquan Policy. Case 2 reflects the conditions if 3.36 m.g.d. is all Fairfax County wants for the foreseeable future as per their letter to the S.W.C.B. dated March 7, 1972.

Regional Plant at 15 M.G.D.

Case 1 (exactly per S.W.C.B. Policy of July 26, 1971)

Fairfax County	5.05 M.G.D.
Prince William County	5.13 M.G.D. 54% Pr. Wm. Co. 1.0 M.G.D. 11% Manassas Park 3.44 M.G.D. 35% Town of Manassas 9.57 M.G.D.
Loudoun County	.38 M.G.D.
Required Plant Total:	15.00 M.G.D.

Case 2

Fairfax County	3.36 M.G.D.
Prince William County	6.08 M.G.D. 54% Prince Wm. Co. 1.24 M.G.D. 11% Manassas Park 3.94 M.G.D. 35% Town of Manassas 11.26 M.G.D.
Loudoun County	.38 M.G.D. 15.00 M.G.D.

By the beginning of 1975, the regional treatment plant will be providing 7.54 M.G.D. capacity for all of Prince William County (including the Towns of Manassas and Manassas Park).

If the regional plant is expanded to 15 M.G.D., it can be assumed that by 1976-77, Prince William County's total capacity (including Manassas and Manassas Park) will be either 9.57 M.G.D. (Case 1) or 11.26 M.G.D. (Case 2).

D. Greater Manassas Sanitary District

G.M.S.D. Plant

This plant process consists of screening, primary aeration, settling, secondary aeration, settling and chlorination. The plant has a certified capacity of 1 m.g.d. The average flow to the plant (1971) is approximately 0.9 m.g.d. although higher rates are reported periodically due to storm water infiltration. Present plans call for this plant to be expanded an additional 1.3 m.g.d. This expansion should be completed in June, 1973, giving the G.M.S.D. plant a total capacity of 2.3 m.g.d.

Westgate (Loch Lomond) Plant

This plant consists of two pairs of Griffith contact aeration plants in parallel followed by a polishing pond. The plant has a certified capacity of .96 m.g.d. The average flow through the plant in 1971 was .935 m.g.d.

EASTERN PRINCE WILLIAM COUNTY

Sewage treatment facilities in eastern Prince William are currently provided by two Sanitary Districts, a private service corporation and the U. S. Government. These include the Occoquan-Woodbridge Sanitary District, the Dumfries-Triangle Sanitary District, the Dale City Service Corporation and the Marine Base at Quantico. In 1969, the Dumfries-Triangle Sanitary District combined with the administration of the Occoquan-Woodbridge Sanitary District. The following sewage treatment plants currently serve eastern Prince William.

A. Occoquan-Woodbridge Sanitary District (O.W.S.D.)

Occoquan Plant

This plant is a conventional trickling filter plant with a certified capacity of 0.3 M.G.D. As of 1971, the annual average daily flow was 0.232 M.G.D. Plans for this

plant include an interim upgrading of the plant by chemical additives.

Belmont Plant

This plant employs a trickling filter operation and has a certified capacity of 1 M.G.D. The 1971 average daily flow was 1.120 M.G.D. The O.W.S.D. is planning to upgrade the plant by chemical additives.

Featherstone Plant

This plant employs a conventional trickling filter process and has a certified capacity of 0.3 M.G.D. Its 1971 average daily flow rate was .220 M.G.D. In July, 1972, the O.W.S.D. installed a 1 M.G.D. package plant at the Featherstone site.

Neabsco Plant

This plant uses the trickling filter process and an aerated lagoon. It has a flow capacity of 1.25 M.G.D. Its average flow in 1971 was 1.15 M.G.D.

As has been pointed out, the capacity of the Featherstone Plant has been increased by 1 M.G.D. This will help out all four of the O.W.S.D.'s sewage treatment plants, because all four plants are interconnected. Therefore, if one plant is above capacity, it merely routes the excess sewage to one of the other plants. The Dumfries - Triangle Sanitary District plants will be connected to the O.W.S.D. system.

B. Dumfries-Triangle Sanitary District (D.T.S.D.)

Dumfries Plant

This plant has a certified capacity of .6 M.G.D. It has an average daily flow of .71 M.G.D. Presently, a .4 M.G.D. addition is under construction which will provide a total capacity of 1 M.G.D. This addition is due to be completed in February, 1973.

Melrose Plant

This plant has a capacity of .25 M.G.D. It is currently treating an average daily flow of .125 M.G.D.

C. Dale City Service Corporation

Section 1, Treatment Plant

This plant, soon to be converted to a tertiary treatment plant, currently has an average flow of 2 m.g.d. It has a certified flow of 2 m.g.d. Plans call for it to be expanded to 4.0 m.g.d. by 1973-1974.

Section 8, Treatment Plant

This plant, which currently meets tertiary treatment standards, has an average and a certified flow of 1.0 m.g.d. Plans call for this plant to be expanded to an overall capacity of 6.0 m.g.d. by 1973 - 74.

D. Dale City Sanitary District

The Dale City Sanitary District was appointed by the Board of Supervisors in early 1972. Although presently

not involved in providing sewage treatment or water to the residents of Dale City, it has been involved in planning for a number of other amenities.

E. Quantico Marine Base

The Quantico Marine Base has three sewage treatment facilities. The main post treatment plant has a certified capacity of 1.75 m.g.d. The Town of Quantico receives its sewage treatment from this plant. The Brown Field Treatment Plant has a certified capacity of .175 m.g.d. and Camp Upshur has a plant with .12 m.g.d. capacity. All three plants provide secondary sewage treatment.

Eastern Prince William is currently implementing a regional approach to waste-water treatment. This approach was initiated in 1963, when the Occoquan - Woodbridge Sanitary District had its consulting engineers develop a long-range sewer plan. This plan, updated one year ago, calls for the eventual phasing out of the existing O.W.S.D. and D.T.S.D. plants. These will be replaced by one regional treatment plant called the Potomac Plant. The present system will be connected to the regional plant by an interceptor system.

Lastly, there is a list of all of the minor sewage treatment plants within Prince William which are not mentioned in the rest of the text. (Table 23)

Conclusion and Outlook

The information contained in this section has emphasized existing physical facilities, rather than the financial and water quality implications of future sewer services. These problems are being studied by the Board of County Supervisors, the Sanitary Districts involved, a special Water Pollution Abatement Task Force appointed by the Supervisors, the State Water Control Board and the State Health Department. These issues will be addressed in a plan for sewer facilities for the 1973-78 period.

It is clear, however, that public sewage treatment facilities will not be able to meet all of the demands that developers are bringing forth in the form of final development plans for new residential, commercial and industrial facilities. It is also clear that Prince William County suffers from a lack of balanced growth (see sections on land use, population and economy).

In order to provide for balanced growth at a rate which is acceptable to the County's fiscal capabilities, a method for allocating sewer capacity is needed that will bring about a more balanced community in the future. This allocation method should be consistent with the County's need for additional employment and light industrial areas and consistent with the County's goals and objectives.

TABLE 23
PRINCE WILLIAM COUNTY'S
MINOR SEWAGE TREATMENT PLANTS

Plant Name	Design Capacity (M.G.D.)	Level of Treatment
Gleaton Trailer Park	.020	Primary
Road Camp #6	.003	Primary
Independent Hill	.04	Secondary
Manassas District Home	.007	Septic Tank & Sand Filter
Nokesville	.025	Secondary
Manassas Air Force Station	.04	Secondary
Dean Elem. School	.005	Secondary
Woodbridge Clay Products	.008	
Partridge School	.022	Secondary
Gardner Trailer Court	.025	
Gainesville Utilities (Lakeview Estates)	.035	Secondary
Oak Park Motel	.010	Secondary
Haymarket-Tyler Elem. School	.0035	Secondary
Linton Hall	.018	Primary
Cole Run Elem. School	.005	Secondary
	.266	

Prince William County also has two privately owned spray irrigation sewer treatment facilities. They serve the small subdivisions of Occoquan Forest and Oakridge Estates, both located in the Occoquan Watershed.

Water Facilities

CENTRAL AND WESTERN PRINCE WILLIAM

Water within Prince William County is provided by either sanitary districts, local jurisdictions, or the U.S. Government. Within the western part of the County, water is provided by the Greater Manassas Sanitary District, Yorkshire Sanitary District and the Towns of Manassas and Manassas Park. Presently, no water is provided by the Gainesville-Haymarket Sanitary District. In the western part of the County, source of the water is primarily well water. Only the Town of Manassas has its own surface water supply. The Greater Manassas Sanitary District currently buys water wholesale from the Town of Manassas and the Fairfax County Water Authority. Water from the Fairfax County Water Authority is piped into the G.M.S.D. through a sixteen inch line from Centreville.

A. Greater Manassas Sanitary District

Water Lines in District (feet)	146,082 (1970)
Water Consumed (gallons)	238,285,000 (1970)
Water Storage Facilities	Lomond Dr. Tank, 200,000 Gallons Mt. Pone Tank, 1,720,000 Gallons

B. Yorkshire Sanitary District

Water Lines in District (feet)	115,749 (1970)
Water Storage Facilities	Maple St. Tank, 500,000 Gallons

C. Town of Manassas

The Town has a 700 acre Reservoir, near Buckland, Virginia on Broad Run. Capacity of the Reservoir is 3 billion gallons. The filtration plant currently processes approximately 1 m.g.d. It has a capability of processing 4 m.g.d. Furthermore, Town officials state that the plant could be physically expanded to process 8 m.g.d. Storage facilities within the Town are enumerated below.

Centreville Road Elevated Tank	500,000 gallons
Prince William St. Elevated Tank	500,000 gallons
Wellington Road Storage Tank	2,000,000 gallons

D. Manassas Park

The Town supplies water through its Water and Sewage Department. Presently, there are 11 1/2 miles of water lines. Daily water consumption in the Town averages 450,000 gallons. The source of water is wells. The Town has one storage tank, which holds 250,000 gallons. Manassas Park plans to double its storage capacity in the next five years, by building an additional storage tank.

E. Gainesville - Haymarket Sanitary District

Presently, there is no public water available in this Sanitary District.

EASTERN PRINCE WILLIAM

In eastern Prince William, water is provided by the Occoquan-Woodbridge Sanitary District, the Dumfries-Triangle Sanitary District and the Prince William Water Company. In eastern Prince William the source of all water is the Occoquan Reservoir. All water from this reservoir is purchased from the Fairfax County Water Authority on a wholesale basis and then resold to customers within the two Sanitary Districts and by the Prince William Water Company (i.e. serving Dale City). Presently, the O.W.S.D. and the D.T.S.D. have a contract with the Fairfax County Water Authority which expires in 1991. Existing water facilities are enumerated below.

A. Occoquan-Woodbridge Sanitary District

Water lines in District (feet)	455,830 (1971)
Water Consumed (gallons)	964,600,000 (1971)
Water Storage Facilities	I-95 elevated tank 3 mil.gals. Nottaway Tank .5 mil. gals. Lake Ridge Tank .5 mil. gals. A second Lake Ridge Storage Tank is under construction

B. Dumfries-Triangle Sanitary District

Water Lines in District (feet)	112,363 (1970)
Water Consumed (gallons)	167,769,300 (1970)
Water Storage Facilities	Sharon Road Tank,150,000 gal.
	Melrose Tank, 100,000 gal.
	Battery Hill Tank, 2 mil. gal.

C. Prince William Water Company

Water lines in District (feet)	262,450 (1971)
Water Consumed (gallons)	440,000,000 gal. (1971)
Water Storage Facilities	1 Tank 2.5 mil. gal.
	(Ground Storage located near Ashdale Plaza)

Prince William Water Company is currently constructing one elevated tank near Dale Boulevard and Minnieville Road with a storage capacity of one million gallons. Plans call for a second one million gallon elevated tank to be built near Pioneer Drive in Dale City.

Prior Planning For Water Supplies

A great deal of study has been undertaken by Prince William County concerning the need for future water supplies. For eastern Prince William, it has been assumed that the Fairfax County Water Authority will be able to meet future demand. Currently, the contract with the Fairfax County water Authority and the Occoquan-Woodbridge Sanitary District runs until 1991. With the Occoquan Watershed Policy in force, it can be expected that the water feeding into the Occoquan Reservoir will be of an increasingly higher quality.

The situation of future water for the western part of Prince William County is more acute. Most agree that some type of surface water supply is needed. Because of the expected population growth, well water will not be sufficient due to the geological make-up of the County. Although some studies have said that water might be pumped from the Potomac River across Loudoun County to the Prince William area, studies have shown this to be impractical due to the polluted condition of the river near the mouth of Goose Creek.

In a study done by Wiley and Wilson in 1966, it was projected that the County's water needs will ultimately be 46 m.g.d. by the year 2000. This would serve a projected population (estimated by Wiley and Wilson and exclusive of Quantico Marine Base) of 298,000. In that study, they suggested that the optimum water source would be Lake Jackson, backed up with the proposed Cedar Run reservoir at Brentsville. The County has purchased the Lake Jackson Dam, lake property and the water rights of Lake Jackson. The 1966 Wiley and Wilson report also mentioned a number of other possible sites for impoundment. These include a proposed reservoir on Broad Run near Linton Hall School, a proposed reservoir on Broad Run at Brentsville and a proposed reservoir on Cedar Run above Catlett.

Running concurrently with these planning activities, many have recognized the possibility of the Salem Church Dam and its impoundment as a future water source for Prince William County. While this is currently an authorized project of the Corps of Engineers, it has yet to be built. Besides running into opposition from local environmentalists, recently Virginia Attorney General Andrew P. Miller has said that the transfer of water from the Rappahannock River basin to the Potomac basin is illegal under present state law. Some 60% of the water to be impounded in the Salem Church reservoir is destined for Potomac basin counties in Northern Virginia.

Realizing the need to study future water needs in Northern Virginia, several members of the Board of Supervisors of Prince William County currently are meeting with several members of the Fairfax County Board of Supervisors to discuss future water requirements. A definite need still exists for the County to come to grips with its future water supply problem. Without an adequate water supply, future development will be greatly hindered.

TABLE 24 : EXISTING SCHOOLS, JANUARY, 1973

A. ELEMENTARY SCHOOLS

School	Capacity
Baldwin	600
Bennett (New)	840
Bennett (Old)	360
Bel Air	615
Belmont	615
Coles	570
Dale City	615
Dumfries	600
E. Vaughan	600
Featherstone	600
Gainesville	410
Gainesville Annex	210
Graham Park	965
Independent Hill (Special Education)	60
Kilby	630
Loch Lomond	600
Lynn	630
Manassas Park	630
Marumsco Hill	780
Neabsco	900
Nokesville	480
Occoquan	705
Parkside	660
Potomac View	780
Rippon	600
Sinclair	680
Sudley	900
Triangle	540
Tyler	630
Washington-Reid	240
West Gate	780
Woodbine (Special Education)	120
Yorkshire	600
Kerrydale (to open in June, 1973)	900

B. JUNIOR HIGH SCHOOLS

School	Capacity
Godwin	1,050
Brentsville	295
Dean	575
Graham Park	965
Lynn	965
Marsteller	980
Parkside	835
Rippon	975
H. J. Saunders (to open in 1973)	1,000

C. HIGH SCHOOLS

School	Capacity
Brentsville	380
Garfield (new)	2,500
Osbourn (old, to become junior high school)	1,070
Stonewall (old, to become junior high school)	1,335
Woodbridge (old, to become junior high school)	1,430
Stonewall (new, to open in 1973)	2,500
Osbourn (new, to open in 1974)	2,500
Woodbridge (new, to open in 1974)	2,500

Community Facilities

EDUCATIONAL FACILITIES

The education of the young people of any community is the largest single item of public expense, and it is an even greater factor in rapidly growing areas like Prince William County. For example, in Prince William County's General Revenue Fund for Fiscal Year 1972, 78% of the total outlay was for education. In order to implement the goal of providing "immediate and continuous improvement in the quality of education and educational facilities", it can be expected that Prince William County will need to continue to make similar monetary commitments for its educational programs during the next five-year period.

Although there is currently no enabling legislation which specifically permits Virginia Counties to require developers to dedicate land for school sites, many developers within Prince William County have cooperated with the County and have donated land for school sites. The County has generally asked that developments which generate enough children to warrant a new elementary school dedicate 15 acres of land for such a school. Plans are currently underway to have similar developments contribute a percentage of the cash needed to acquire a new school site, depending upon the amount of housing units within each of these developments. Likewise, the County has also encouraged these smaller developers to get together with other small developers and jointly donate a school site. If a developer builds a development which generates more children than one elementary school can accomodate, the County is encouraging the developer to make a cash donation to cover the additional children. As pointed out earlier, although Virginia law does not provide enabling legislation which permits Virginia Counties to require mandatory dedication, many Counties in the United States have ordinances which require mandatory dedication.

Current County School Board policies state that elementary schools in high density areas should have an enrollment of 900 pupils, while schools in rural areas should have an enrollment of 600 pupils or less. Currently, elementary schools are being placed on 15 acre sites, located away from major thoroughfares and arterial class streets. Although somewhat flexible, it is recommended that whenever possible an elementary school should only serve pupils living within one mile of the school. Primarily, this is to enable children to walk to school. This becomes particularly important if kindergarten is started in Prince William, as it is planned that kindergarten will be only on a half-day basis.

The Prince William County School Board and the Prince William School Department is currently working on two projects which will greatly affect future school planning. One is the possibility of year round schools in the County and the second is instituting kindergarten in Elementary Schools. The current Capital Improvements Program for schools is based on the regular nine-month school year. The School Board is presently operating an experimental year-round school program in Dale City. Evaluations of the year-round program are being made by the School Board. The School Board will consider continuation and expansion of the year-round school plan to the total county school system. This will be done before any request for additional bond funds are made for new construction. If the year-round system is adopted, considerable change will be required in the C.I.P. Program which would require air-conditioning and upgrading of approximately 30 older school facilities.

The school staff is currently preparing reports for the School Board for instituting a kindergarten program in the public schools. No date has been established yet for beginning the kindergarten program. The current C.I.P. Program anticipates that kindergarten on 1/2 day basis will be in operation before 1977.

The County is now or will shortly be served by 46 Schools, some of which are still under construction or scheduled for conversion. These schools, with their capacities, are listed on Table24.

LIBRARIES

Presently, there are two libraries within Prince William County. The Library Headquarters, located on Route 28 in Manassas (Near Manassas Park Line) was opened in the fall of 1970. It has 46,303 volumes. The Leesylvania Branch, located in the County Administration Building in Woodbridge, currently has 29,789 volumes. Both facilities are used to capacity. There is a pressing need for expanded library facilities within the County.

PUBLIC PROTECTIVE SERVICES

Fire Protection, Prevention and Rescue

The Fire Service of Prince William County coordinates plans to meet the demand arising from residential, commercial, and industrial construction within the County. Primarily a volunteer organization, the Fire Service is staffed by one paid fireman at each station during the day. Presently, there are ten volunteer Fire Departments within the County. They are the Manassas Volunteer Fire Department, the Manassas Park Volunteer Fire Department, the Yorkshire Volunteer Fire Department, the Haymarket Volunteer Fire Department, the Lake Jackson Volunteer Fire Department, the Dumfries-Triangle Volunteer Fire Department, the Occoquan-Woodbridge-Lorton Volunteer Fire Department, the Coles Volunteer Fire Department, the Nokesville Volunteer Fire Department and the Dale City Volunteer Fire Department. The Fire Service has requested the Board of Supervisors for additional paid firemen. The Volunteer Fire Departments also provide rescue operations within their boundaries.

Basically, sites for fire stations should be located to serve an area within a two mile radius of the Fire Station. However, the quality of roads serving the area, their alignment and the presence of barriers such as railroads, streams and limited access highways must be taken into account when determining the effective service areas. The density of population to be served and the type of fire hazards present also are important factors. A general rule of thumb, based upon the experience of the National Board of Fire Underwriters, states that residential areas should be served by fire stations located from one and one half to three miles from all homes, depending upon the density of population. In high density areas, and in industrial and commercial areas, fire stations should be located to serve a one mile radius.

Police Department

The Prince William County Police Department was established by resolution of the Board of Supervisors. It commenced operation on July 1, 1970. An initial strength of 76 employees was authorized. The Department maintains offices in Manassas (in the Old Bennett School) and ;in the Garfield Administration Building. The County has been divided into patrol areas with officers assigned to each area. This was done to reduce to a minimum the response time in answering complaints. With the population growing so rapidly in Prince William, it can be expected that the Police Department will have to hire additional policemen.

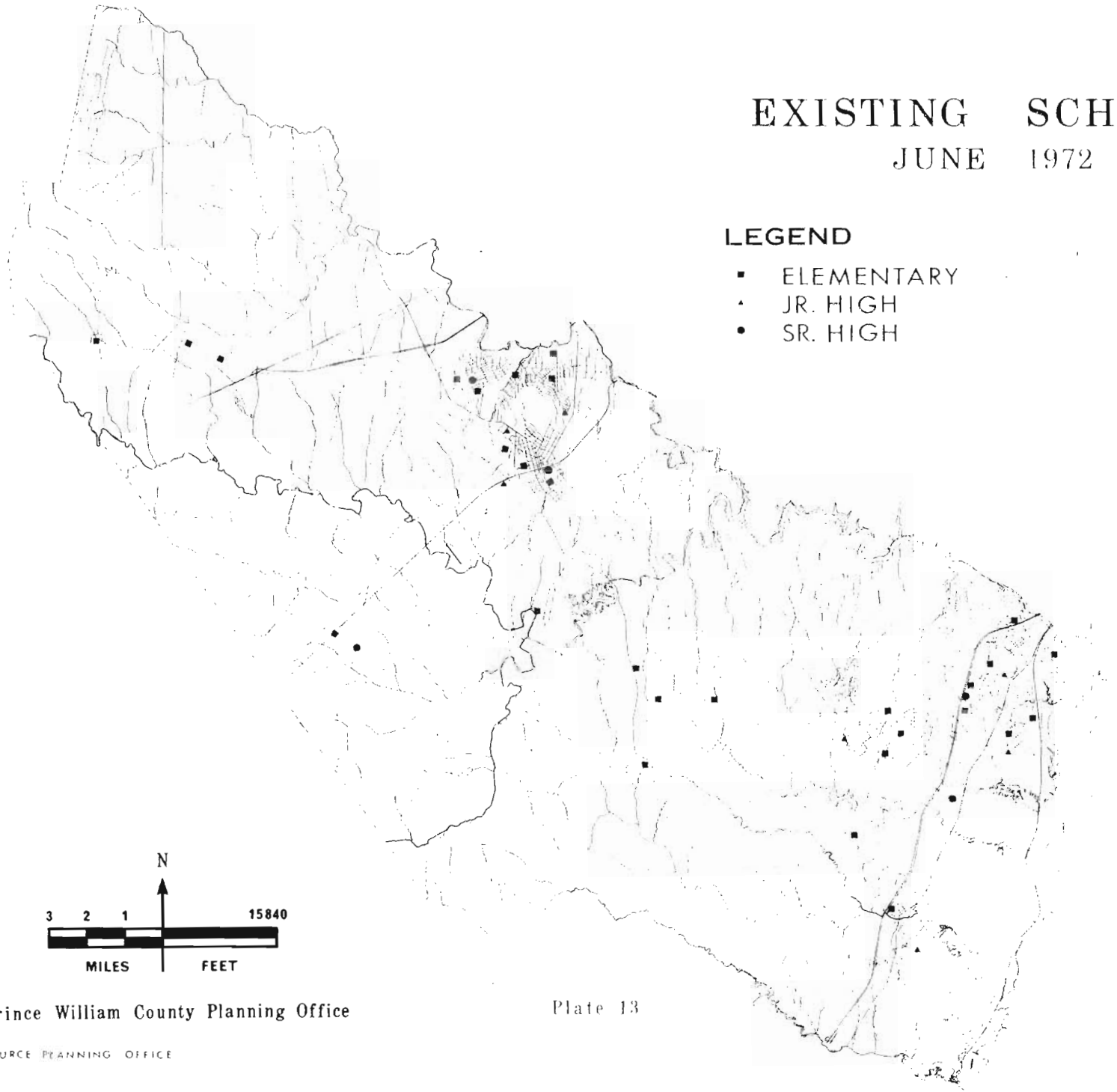
Sheriff's Department

The Sheriff's legal obligation is to provide for the care and maintenance of the Prince William County Jail and its inmates and to provide court bailiffs and process servers. To assist the Sheriff he maintains a staff of 36 employees. Presently, the County jail in Manassas has 62 spaces and an overnight lock-up in Garfield has 10 spaces. New jail facilities are needed. The County has been notified that state standards require a larger facility.

GENERAL GOVERNMENT OPERATIONS

Presently, Prince William County has County offices in two locations. The major activities of the County Government, including the County Courthouse, are located in Manassas, the County Seat. Administrative offices, including the branch of the Finance Office, a branch of the Public Works and a branch

EXISTING SCHOOLS
JUNE 1972

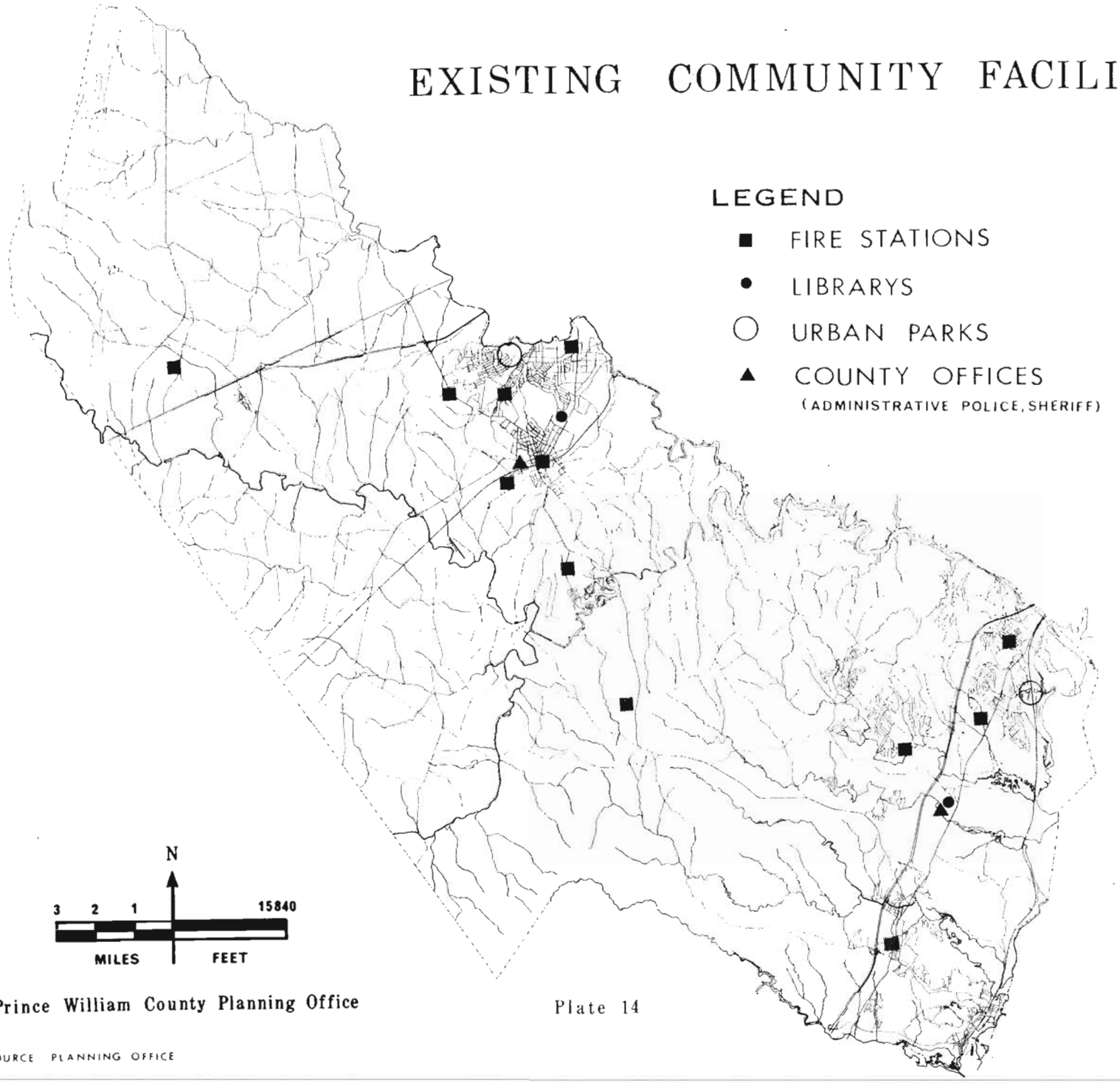


Prince William County Planning Office

Plate 13

SOURCE PLANNING OFFICE

EXISTING COMMUNITY FACILITIES



Prince William County Planning Office

Plate 14

SOURCE PLANNING OFFICE

of the Parks and Recreation Department are located in the Garfield Administration Building in Woodbridge.

SOCIAL SERVICES BOND REFERENDUM

On November 3, 1970, the voters of Prince William passed a 1.2 million dollar bond referendum for new social services facilities. The facilities which this bond referendum proposed are all outlined in the current Capital Improvements Program. Proposed facilities include a Juvenile Detention Home, facilities for the mentally retarded, a rehabilitation unit, a Comprehensive Community Mental Health Center, a psychiatric bed unit, and a Health and Welfare Complex.

The Planning Office has written a number of reports concerning the proposed facilities outlined in the Social Services Bond Referendum. Toward the end of 1969, the Planning Department completed a study of possible sites for the Juvenile Detention Home. In November; 1971, the Planning Department presented the Planning Commission a draft copy of a large report entitled Planning for Social Services Facilities in Prince William County. This report deals with all the proposed facilities in the Social Services Bond Referendum, and makes recommendations on each facility.

Since the Planning Department's report entitled Planning for Social Services Facilities in Prince William County, the County lost the federal share for the Juvenile Detention Home because a site for the Juvenile Detention Home could not be found. Recently, two sites of land have been offered to serve as sites for two schools for the mentally retarded. One site is on the Conner Tract in Manassas and the second is on the Potomac Hospital site in Woodbridge. Other facilities proposed in the Social Services Bond Referendum are still in the planning stages. In addition, the Board of Supervisors has committed the funds initially planned for the Welfare facility to be spent upon the mental retardation facilities. A new wing for the Health Department building in Manassas will soon be constructed.

PARKS AND RECREATION FACILITIES

The need for increased park and recreation facilities in Prince William County is at a critical time in the urbanization of the County. The County population and accompanying residential development have far outpaced the acquisition and development of parklands and facilities, resulting in a critical shortage of recreational opportunity for its citizens.

The County presently has less than 18% of the minimum park acreage which it should have in order to meet the minimum requirements for recreational facilities for its citizens. These standards, which are found in Table II, are set by the National Recreation and Park Association. The proposed five year plan for Capital Improvements call for acquisition of 2,958 acres of land during the 1972-77 period in an attempt to partially eliminate the hugh deficit of park lands in Prince William County. This acquisition program would bring our park properties up to 69% of the total park lands which are needed to meet the minimum requirements for the citizens of Prince William County in 1977.

The following acquisition and development proposals provide further details regarding the five year Capital Improvements Program, which would require the passage of a bond referendum to support the financial cost.

The Prince William County Parks and Recreation Department, in keeping with the current planning concepts and population projections, is striving to develop a network of neighborhood, community, urban, historical and large County Parks. It is also hoped that in some instances stream valleys may be utilized in linking one or more types of facilities. Each type of facility in the network serves a specific need of the citizenry and must be developed accordingly.

County Park Acquisitions

At the present time, Prince William County does not own any "County Parks". According to the national standards which

were mentioned in Table 11, our County presently has a deficit of 1,935 acres (minimum) in county parks. By 1977, this deficit will be 2,580 acres. The proposed plan for county parks will preserve areas of Lake Manassas, the Potomac, Bull Run, and the Occoquan from development pressures and will provide approximately 1,800 acres of the most scenic land in the county for outdoor recreation and conservation use.

Urban Park Acquisitions

Presently, the County maintains two urban parks. One is the Ben Lomond Park in Manassas and the second is the Marumsco Creek Park in Woodbridge. The need for urban parks to provide primarily active recreation facilities for intense use by populated urban areas is extremely great. According to the national standards, there is a present deficit of 420 acres in urban parks. Presently, land is being acquired for three urban parks in the Dale City RPC. The Parks and Recreation Department is planning to develop at least two of these urban parks by 1977.

Special Facilities

The County may have an opportunity to acquire and develop a county revenue-producing golf course in the near future. In this event, a feasibility study would be conducted for the use of revenue bonds to finance the development of the course. The costs of the bonds would be liquidated by greens fees and other revenue from the facility. There is also an urgent need for public fishing marinas and community centers which are being proposed for development. In this case, the marinas would mean simply launching facilities for small craft to take advantage of water facilities in the County.

Community - School Parks

Two junior high schools are proposed to be built in the next five years. Four senior high schools are going to be converted to junior high schools in the next five years. The Parks and Recreation Department proposes to spend approximately $55,000.00 average per site for construction of the following typical facilities: landscape plantings, play apparatus, shelter and storage building, grading and drainage, water lines and some access asphalt roads and parking areas.

Recreational Facilities

To a limited extent, many school sites in the County provide recreation opportunities for nearby residents. However, institutional arrangements and the physical layout and topography of school sites do not permit full usage.

The County Parks and Recreation Division operates a number of limited facilities, only two of which, the urban parks, provide for more than strictly local use. These facilities are:

Marumsco Creek Urban Park (includes community center, swimming pool, tennis courts, ball fields, picnic areas)

Ben Lomond Urban Park (includes swimming pool, tennis courts, ball fields, picnic areas)

Cloverdale Community Park (includes tennis courts and ball fields)

Dale City Recreation Area (includes civic center, swimming pool, and tennis courts)

Manassas Park Swimming Pool

Graham Park Swimming Pool

Occoquan Tennis Courts

Organized baseball and football are very popular sports in Prince William County. League demands for ballfields cannot be met with the present number of facilities. As the number of teams increases, they will need additional ballfields. These extra requirements only serve to widen the gap between needed facilities and available facilities.

Neighborhood - School Parks

Twelve new elementary school-park sites and ten existing school-park sites require or will require apparatus areas, grading and seeding, drainage, water lines, plant materials, and pathways, at an approximate average cost of $15,000.00 per site.

Historical-Cultural Parks

Many vestiges of national, state and local history are evident throughout the County. Some County historical sites date back to the pre-Revolutionary War. Many of these structures are privately owned and are thus inaccessible to the public. Some have been restored to their original state, but many are abandoned and unoccupied.

The Historical Commission of Prince William County should study sites and priorities for the feasibility of restoration. The Commission's report will be considered by the Park and Recreation Department, and the more significant sites could be acquired, restored and preserved by the Department for educational and passive recreational benefits.

Regional Parks

Bull Run Regional Park, located in Fairfax County, is operated by the Northern Virginia Regional Park Authority. The park chain contains over 2,000 acres which were acquired for conservation and recreation purposes. Outdoor recreation facilities are provided for camping, hiking, picnicking, swimming, fishing and boating.

The land along the Bull Run and Occoquan which lies within Prince William County could be acquired for conservation and outdoor recreation purposes by the Northern Virginia Regional Park Authority. Membership in Northern Virginia Regional Park Authority would require Prince William County to contribute for a land acquisition and development program and per year to the maintenance program.

State and Federal Parks

Prince William Forest, operated by the National Park Service, currently has 12,290 acres of land for forest preservation, conservation, wildlife preservation, and limited outdoor recreation. A proposed expansion of 1,756 acres will provide a total of 14,046 park acres. The recreation facilities provided for people from throughout the nation include overnight camping areas, picnic areas and pavillions, resident camps, and hiking trails.

The primary purpose of Prince William Forest Park is to provide a national conservation and outdoor recreation facility. Although the park does offer facilities to County residents on a limited basis, numerous Boy Scout, Girl Scout, and community groups are denied its use because of other demands upon the facility. County residents desiring overnight camping are frequently denied this opportunity because camp sites are filled with tourists visiting the Washington, D. C. area.

Manassas National Battlefield Park consists of 2,700 acres. The Battlefield Park portrays a rich history, and its development includes a natural history museum, pleasure driveways, historical monuments and markers, and limited picnic facilities. The underlying purpose of the park is basically to convey an historical heritage of national significance. It provides passive recreational benefits to Prince William County residents, but does not preclude the need for the outdoor recreation facilities identified with large acreage county parks.

Conway Robinson State Forest has approximately 400 acres of undeveloped land for reforestation, forest preservation, and forest management research purposes. The land deed specifically restricts outdoor recreation facility developments, but hiking and nature study activities are permitted.

The existing private and quasi-public recreation facilities offering limited or restricted use include various apartment building swimming pools and the following outdoor recreation areas as listed below:

Evergreen Country Club
Greenwich Golf Course
Manassas Hills Golf Course
Presbyterian Church Camp
Baptist Church Camp
Camp Tapawingo
Lake Jackson
Silver Lake
Occoquan Forest
County Fairgrounds
Prince William Archery Club
Fairfax Rod and Gun Club
Old Dominion Speedway
Triple B Riding Stables
Manassas Riding Stables
Jackson Hollow
Prince William Marina
Neabsco Marina
Occoquan Marina
Lake Ridge Park and Recreation Association

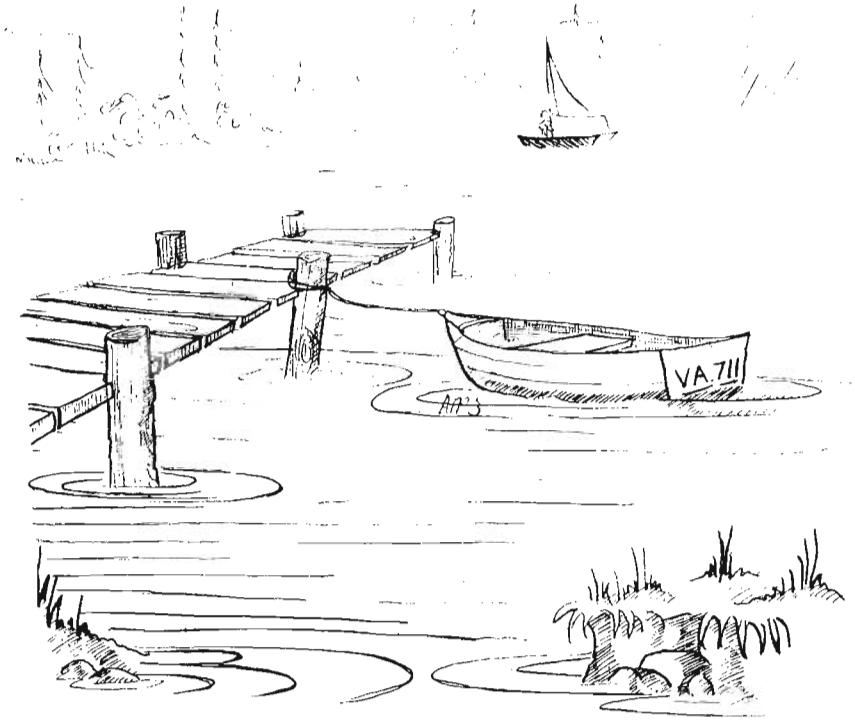
Although these private and commercial recreation facilities aid in fulfilling public outdoor recreation needs, their restrictions in membership and fee requirements prohibit many County residents from enjoying the recreation opportunities available.

Programmed for development by the Greater Manassas Sanitary District is the Sudley Barn Community Center. Also programmed for development by the Dale City Sanitary District, are several major recreation facilities in Dale City.

In conclusion, park and recreation facilities for the suburban resident of Prince William County are well below desired standards as set forth by the National Recreation and Park Association. A plan for the future should seek to take advantage of all possible ard feasible methods for developing additional needed recreation areas.

Land Fill

Prince William County owns and operates a sanitary land fill near Independent Hill. To this facility is hauled trash by commercial trash pick-up companies and by individual county residents. Established several years ago, fees paid by users are designed to cover the operating costs.



Current Status of Comprehensive Planning

The Planning Commission was established in 1954. A subdivision control ordinance, administered by the Department of Public Works, was adopted in 1956. A zoning ordinance was enacted in 1958. The Planning Department was established in 1961. A trailer park ordinance was enacted in 1960 and a site plan control ordinance in 1965. More recently, a soil erosion control ordinance has been adopted, which is administered by the Department of Public Works.

Although advance planning activities were undertaken by the Planning Department at an early date, the first county-wide effort was a comprehensive plan completed in 1964 by a consultant for the Planning Commission. The plan was amended by the Planning Commission and recommended to the Board of Supervisors in 1965. The Board of Supervisors referred the plan back to the Commission with the recommendation that additional study was necessary, particularly in the more urbanized areas of the county.

It was determined that the County's approach to comprehensive planning would be through study of sub-sections of the County. The plans prepared for each sub-section, called planning areas, would be adopted one by one, the objective being to eventually cover the entire County with adopted planning area plans.

Existing Planning Areas

Existing planning areas in Prince William County are shown on Plate 15. Since 1966, plans have been prepared and adopted for the Woodbridge, Occoquan, Dale City, Powells, and Manassas Planning Areas. A number of amendments to these plans have also been adopted. In 1969, the Prince William Industrial Complex was adopted as part of the County's comprehensive plan in the Wellington-Gainesville area.

In 1969, a plan was prepared for the Gainesville Planning Area. This plan with several modifications, was recommended for adoption by the Planning Commission but was not adopted by the Board of Supervisors. Instead, it was referred back to the Planning Commission for restudy along with an alternative plan for this area proposed by the Gainesville-Haymarket Planning Association, a citizens group.

The planning area approach has not been entirely successful, due to the time required to develop detailed plans, to the lack of county-wide perspective and to lack of consideration of timing of development. One of the purposes of this general county-wide plan is to provide a physical and policy framework within which sound planning may be carried out at the planning area level. It is anticipated that revised boundaries will be developed for planning areas in the next section of this general plan.

The boundaries between planning areas are formed mainly by the major highway network, major streams and watershed boundaries. Drainage areas and the resultant sewage collection systems that exist and will exist in the future also provide an important criterion in the delineation of the planning areas. Since highways in this area tend to follow ridges rather than the valleys, they usually coincide with the major dividers between watersheds.

A question naturally arises concerning the importance of the magisterial districts which already exist in the county. These are established to serve political representation with little recognition of natural boundaries formed by physical, economic or social considerations. The use of such districts as planning areas would tend more to disrupt the planning process than to facilitate it.

EXISTING PLANNING AREAS

(APRIL 1972)

Prince William County Planning Office

Plate 15

SOURCE: PLANNING OFFICE

The purpose of the planning areas is to facilitate future planning. Once the county comprehensive plan is available as a basic framework, each planning area may be planned in greater detail.

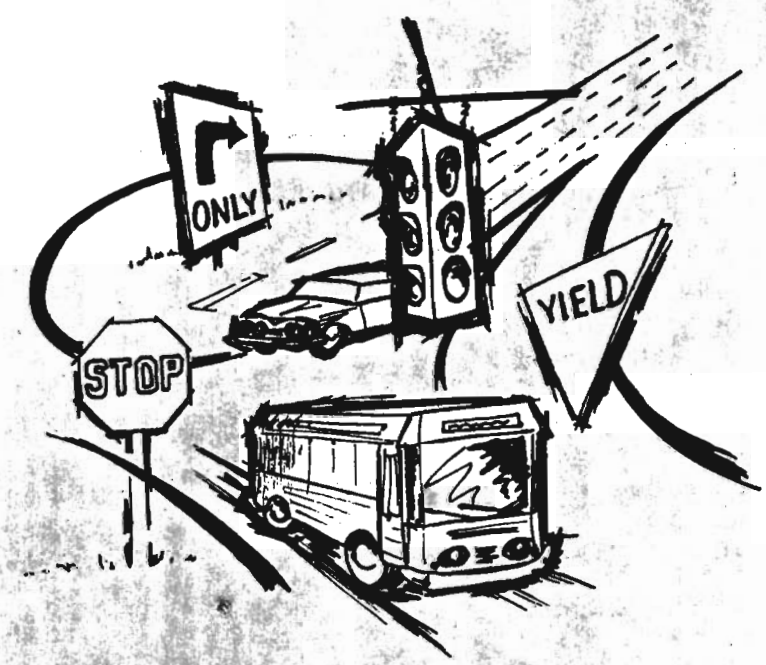
Another important function of the planning area study is to provide data collection areas for the future. Hopefully, the boundaries established here will be reflected in future Census Tracts, enumeration districts, school attendance districts and other statistical areas.

"WHERE ARE WE GOING?"

The sections of Part I of the General Comprehensive Plan, entitled "Where Are We Now?", provide the basis for Part II, "Where Are We Going?" The information provided above has indicated the County's problems and needs, as well as its resources and potentials. The first part of the Part II will be concerned with the County's goals and objectives.

OFFICE COPY

COMPREHENSIVE PLAN FOR PRINCE WILLIAM COUNTY, VIRGINIA



SECTION II WHERE ARE WE GOING?

Part A

THE
TRANSPORTATION PLAN

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A part of the comprehensive plan for the physical development within the jurisdiction of Prince William County, pursuant to the provisions of Title 15.1, Chapter 11, Article 1 of the laws of the Commonwealth of Virginia.

Prince William County Planning Office
Garfield Administration Building
15920 Jefferson Davis Highway
Woodbridge, Virginia 22191

PRINCE WILLIAM COUNTY

BOARD OF COUNTY SUPERVISORS

9250 LEE AVENUE
MANASSAS, VIRGINIA
PHONE: (703) 368-9171

The Citizens of Prince William County

Ladies and Gentlemen:

It is our pleasure to present herewith the Transportation Plan for Prince William County, adopted by the Board of County Supervisors by Resolution #75-5-29 of August 6, 1974.

This plan is an integral portion of the Comprehensive Plan for the physical development of Prince William County. The Transportation Plan, the first County-wide adopted plan, identifies transportation objectives and proposes a plan for achieving those objectives with an emphasis on actions to be taken over the next five year period. The plan was developed in cooperation with the Virginia Department of Highways, the Transportation Planning Board of the Metropolitan Washington Council of Governments, Northern Virginia Planning District Commission and the incorporated towns within Prince William County.

Several public hearings were held on this plan by the Planning Commission and the Board of County Supervisors. The interest and assistance of County citizens have been beneficial to the development of this adopted version. While the plan will be modified periodically, it is hoped that it will serve as a basis for the County's development. As such, it should be of considerable assistance in building a finer County.

Respectfully presented,

Charles J. Colgan, Chairman
Prince William County Board of Supervisors

HGB/sah

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THE TRANSPORTATION PLAN

Introduction

The Transportation Chapter of Section I - WHERE ARE WE NOW? discusses the importance of a transportation system as a key element in the implementation of a Comprehensive Land Use Plan. Section I describes current transportation planning in Prince William County. Also discussed is the current roadway classification system, and the parties responsible for building roads in Prince William.

Most importantly, Section I identifies the major problem areas in the present transportation system. Section I defines seven inadequate road facilities and discusses three totally new facilities which would serve existing and anticipated needs. The deficiencies discussed exist because the County's transportation system has not kept pace with the recent surge of residential, commercial, and industrial development.

TRANSPORTATION OBJECTIVES

Examination of possible solutions to existing problems and anticipated needs must be made in the context of the County's transportation objectives and policies in relation to its comprehensive land use plan. The following eight general objectives have been identified. The policies for implementing these objectives are stated in the final section of this element of the plan.

Transportation Plan Objectives

1. Provide a safe and efficient transportation network for the movement of people and things.
2. Provide adequate access to all areas at a level of service appropriate for the needs of each area.
3. Stage the development of the transportation system to complement the planned overall development of the County.
4. Provide for improvement of existing deficiencies before creating facilities primarily intended to serve future development.
5. Design highways that minimize the destructive physical impact on the environment and to provide the best possible opportunity for compatible development.
6. Design the transportation system as a comprehensive network, with each element planned to perform functions that do not conflict with each other.
7. Seek methods for promoting mass transit services.

8. Cooperate with regional, state and federal officials in order to promote plans of regional benefit.

TWO CRITICAL CONSTRAINTS

In evolving a plan to carry out the above objectives, however, certain constraints must be recognized. These are critical constraints which cannot be effectively handled by policy statements.

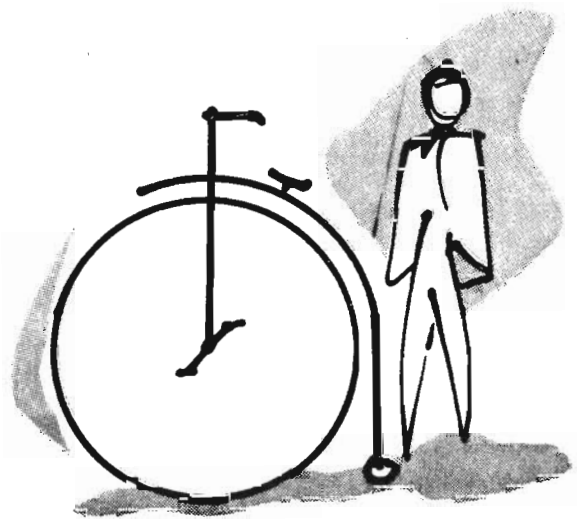
Insufficient Funds

The most obvious and profound constraint is the limited public resources for transportation-related projects in Prince William County. Numerous examples can be cited to illustrate that, under past and present policies, government has been unable or unwilling to provide enough money to satisfy highway transportation demands. The amount of public funds allocated to highway construction in Prince William County has not kept pace with the increase in travel requirements brought about by urbanization. The delay of needed Federal funds for construction of interchanges, the time required for completion of highway improvements, and the erosion of the State Roads Commission Six-Year Program due to escalating costs are specific examples of delays in financing needed transportation facilities. Thus, a very real problem in implementation of the comprehensive plan is the lag in public expenditures for highway facilities. Attention should be focused on the need for public support to maintain appropriate levels of funding for highway facilities.

Split Responsibility for Land Development and Transportation

In the absence of consistent and unified transportation and land use policies at the State and Federal levels, it is difficult to develop at local levels meaningful land use policies having adequate provision for all transportation systems. Among all public improvements affecting the spatial distribution of population and economic activity, transportation facilities are more dependent upon State and Federal financing and decisions than other public facilities. Due to the fragmented nature of transportation policy at the State and Federal levels, the County has been in the position of determining development policy which it hopes will be served by transportation facilities provided by other government agencies. In recent years, attempts have been made to encourage State and Federal highway agencies to give full recognition to the planning goals and objectives of the communities which highways and other transportation facilities are intended to serve. Hopefully, better coordination will be possible in the future.

This transportation plan focuses on the two major transportation issues of the County, highways and mass transit. Air transportation is covered briefly and other transportation elements such as freight movements and water-born transportation are not included.



1 Existing Plans for Major Highways

The following section examines the published plans of the Virginia Department of Highways, the Metropolitan Washington Council of Governments and Prince William County. It should be stressed that none of these plans are rigid programs and all are subject to review and modification.

COG/TPB CERTIFICATION PLAN UPDATE

On June 20, 1973, the Transportation Planning Board (TPB) of the Metropolitan Washington Council of Governments (COG), of which Prince William County is a member, adopted a "Long Range Transportation Plan for the National Capital Region". This plan fulfills the requirement of the Federal Highway Administration that an annual certification plan be prepared so that the regional body may continue to receive federal funding for transportation planning. This "certification plan" is "for planning purposes only and in order to obtain comments from citizens and governing bodies..." The major highways that directly affect Prince William County are shown on Plate 1 and are listed in Table 1. (Transit elements of this certification plan are treated elsewhere in this document.)

VIRGINIA'S ROADS AND STREETS, 1972 - 1982

In December of 1971, the Virginia Department of Highways published a report listing a proposed ten year statewide program. This document considers interstate construction projects in Virginia, proposed primary and urban construction projects, proposed distribution of construction funds to the secondary system and aid to mass transit.

The quote below is from the introduction to this document:

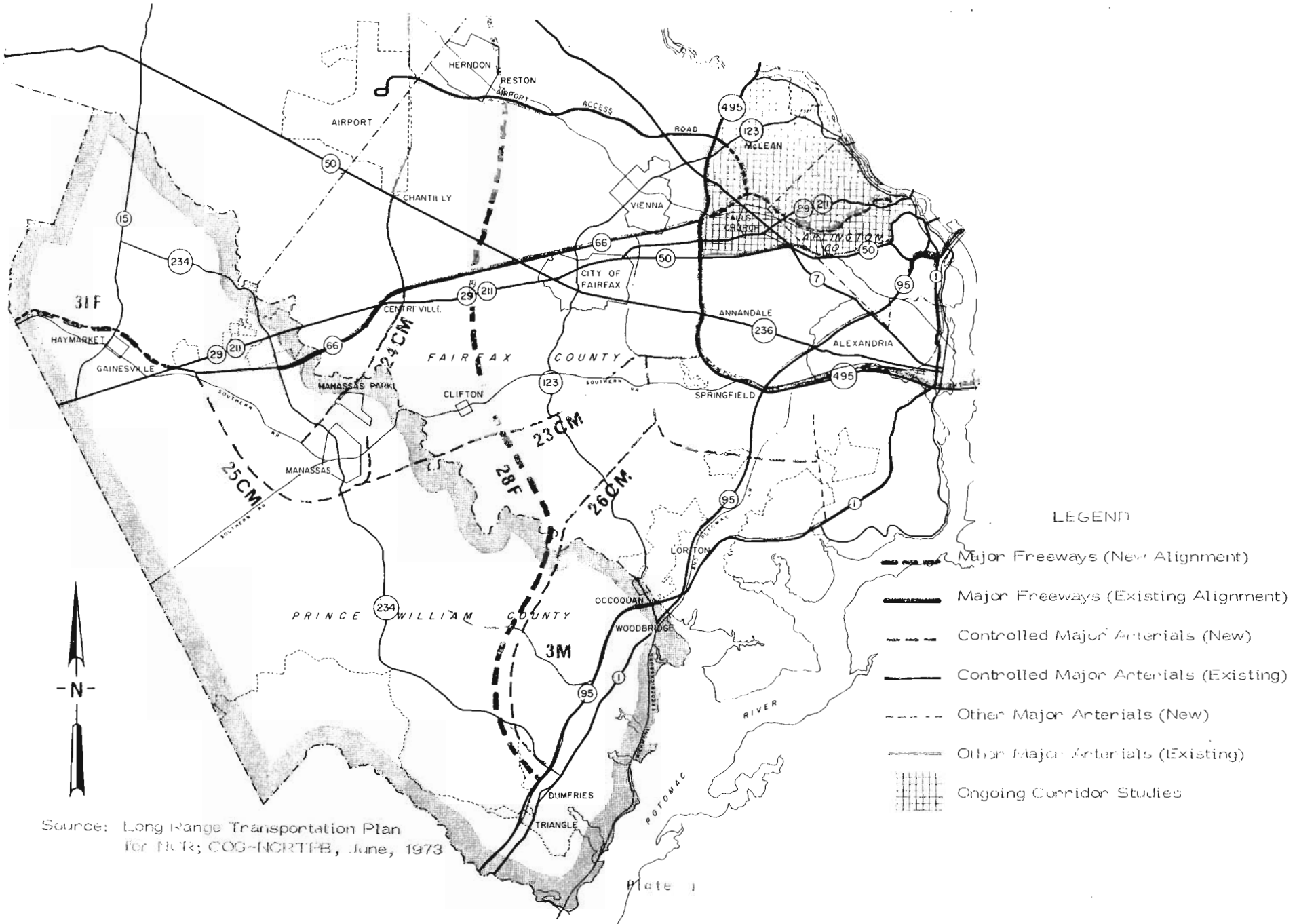
> "The following projects are those envisioned as essential to the highway improvement program being proposed by the Department of Highways to the Virginia Advisory Legislative Council. Based on presently available traffic and engineering information, the listing is intended as a fiscal and planning guide for the development of specific work projects. The overall program will be refined and broken into yearly construction increments on a priority basis. Urban priorities, especially, will be selected in cooperation with local government officials to assure maximum benefits and minimum disruption in the communities affected."

The report, as implied above, does not list the year each project is to be implemented during the ten year period.

Aid to Mass Transit. Prince William County is a part of the Culpeper District which includes 11 other counties in the northern part of Virginia. The Culpeper District is projected to receive $38.5 million dollars for "Highway Aid to Metro and Bus Transit" (See Transit Element).

Interstate Construction Projects. The following information is quoted from the report:

> "The program for construction of the Interstate System of Highways was originated by the Federal Government in 1956 with an estimated completion date of 1972. The construction is financed on a 90% Federal - 10% State ratio. The Highway Commission at the initiation of the Program adopted a policy of matching Federal Funds as they became available and has adhered fully to this policy. Federal Funds have not been apportioned at a rate sufficient to keep the program on schedule, and with the original completion date imminent, the system is far from complete nationwide. In Virginia, with 1,077 miles in the total system, 862 miles have been completed or under construction leaving 215 miles estimated to cost $777,800,000 to be placed under construction. Assuming Interstate Federal Aid is to continue at the present rate, it will be about ten



Source: Long Range Transportation Plan for NVR; COG-NCRTPB, June, 1973

Plate 1

TABLE 1: COG/TBP CERTIFICATION PLAN: HIGHWAY ELEMENTS THAT AFFECT PRINCE WILLIAM COUNTY

MAP NUMBER[1]	HIGHWAY ELEMENT	NAME	FROM	TO	STAGING[2]
23CM	Construct	Monticello Expy.	N. Va. Expy.	Manassas Loop	Late
24CM	Construct	Rt. 28 By-Pass	PWC Line	S. of Manassas	Early
25CM	Construct	Manassas Loop	Rt. 28 (Manassas)	I-66	Late
26CM	Construct	Ridgefield Road	I-95	N. Va. Expy.	Early
28F	Construct	Outer Beltway	I-70S	I-95	Late
31F	Construct	I-66	Fauquier Co.	I-66/29	Early
3M	Widen	Dale Boulevard	I-95	640	Early

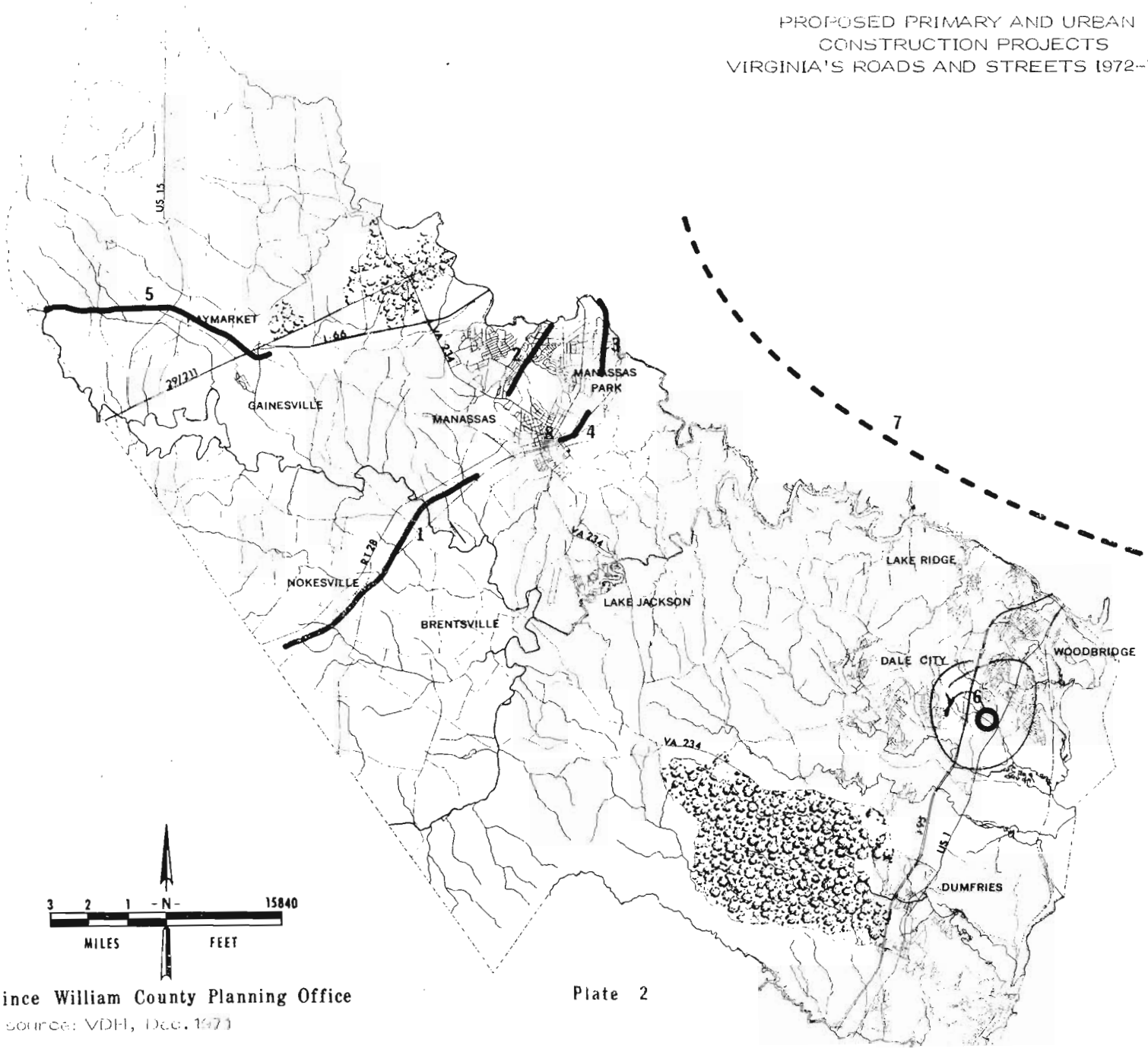
Footnotes:

[1] M= Major Arterial
C M= Controlled (Access) Major Arterial
F= Major Arterial

[2] Early = Recommended for completion within 10 year period.
Late = Recommended for completion within 20 year period.

SOURCE: A LONG RANGE TRANSPORTATION PLAN FOR THE NATIONAL CAPITAL REGION, Metropolitan Washington Council of Governments - National Capital Region Transportation Planning Board, June,1973.

PROPOSED PRIMARY AND URBAN
CONSTRUCTION PROJECTS
VIRGINIA'S ROADS AND STREETS 1972-1982



Prince William County Planning Office

Source: VDH, Dec. 1971

Plate 2

TABLE 2: PROPOSED PRIMARY AND URBAN CONSTRUCTION PROJECTS:
VIRGINIA'S ROADS AND STREETS
1972-73 through 1981-82
Culpeper District

NUMBER ON MAP	ROUTE	CITY OR COUNTY	DESCRIPTION	AMOUNT FINANCED (In Thousands) 1973 - 1982
1	28	Fauquier & Prince William	Rte. 29 (Near Remington)-Manassas By-Pass (Reconstruction by Sections)	$2,100
2	28	Fairfax & Prince William	Manassas By-Pass; 2-lane facility on 4-lane R-O-W	$3,950
3	28	Fairfax & Prince William	Manassas Park-Route 29 (Convert to 4 lanes)	$3,020
4	28	Manassas	Quarry Road-East Corporate Limits (Reconstruct 4 lanes)	$1,170
5	I-66	Fauquier & Prince William	Construction from Gainesville to Marshal By-Pass	Not Given
6	I-95	Prince William	Improve Interchange & Connection to Dale City (Supplemental to Interstate Funds)	$500
7	Outer Beltway	Fairfax	N. Va. Outer Circumferential (Prel. Engineering and Advanced R-O-W)	$3,000
8	Manassas	Other street improvements in Town of Manassas	----------	$2,370
		Reserve for Construction Deficits, Safety Improvements Projects		$24,901

Source: Virginia's Roads and Streets, 1972-1982, Virginia Department of Highways, December, 1971.

years before the system is complete. Highest priorities are being given to those projects meeting the heaviest traffic demands and closing gaps between completed sections."

Table 2 lists relevant interstate, primary, and urban construction projects for the Culpeper District. (see Plate 2)

Secondary Roads. Table 3 shows the various amounts of funds projected for distribution to Prince William and selected surrounding jurisdictions. The allocation to the counties is made by a weighted formula that depends upon area of County, population, road mileage, road use and needs. It may be noted that under the formula used, the 1972 allocation varied widely on a per capita basis as shown in Table 3. Also, this method of allocation penalizes the County that promotes mass transit and minimizes road use through land use policies designed to discourage suburban sprawl.

TABLE 3:

COMPARISON OF PROJECTED FUNDING FOR SECONDARY ROADS

County	Secondary Funds 1972-1973	Estimated Population July 1, 1972	Per Capita Expenditure
Prince William	$2,356,000	125,100	$18.83
Fauquier	$1,416,000	27,100	$52.25
Loudoun	$1,752,000	40,600	$43.15
Fairfax	$8,751,000	482,100	$18.15

Source: U. S. Census - Current Population Reports

The yearly program is made in the context of a six-year needs plan which outlines the expected program of improvements to the County's secondary roads. This six-year plan is developed by the local Resident Engineer of the Virginia Department of Highways. It is intended to be a flexible guide rather than a rigid program.

The proposed improvements for secondary roads in Prince William County during the coming six years are listed in Table 4 and are shown on Plate 3.

SECONDARY ROAD PROGRAM OF THE RESIDENT ENGINEER

After an allocation has been made for the fiscal year, the local office of the Virginia Department of Highways (the County Residency) proposes a list of projects and expenditures for the coming fiscal year. This proposed program is made available to the Board of County Supervisors and citizens for comment. The program is then submitted to the district office in Culpeper, with final approval coming from Richmond.

ROADS SHOWN ON PLANNING AREA DEVELOPMENT PLANS

Each of the five adopted development plans for planning areas (Occoquan, Woodbridge, Manassas, Powells, Dale City) contains a future road network. These plans attempt to project a picture of each area after full development has taken place. No attempt is made to phase road improvements over time. These plans, as adopted and amended, serve as a planning guide for development in the planning areas.

PLANS DEVELOPED BY JOINT EFFORTS OF COUNTY STAFF AND VIRGINIA DEPARTMENT OF HIGHWAYS

A number of proposals for new roads and improved roads have been developed through the cooperative efforts

of the County Staff and the V.D.H. Most of these proposals have been incorporated into the planning area development plans. Some, however, are not located within adopted planning areas, and some are relatively recent proposals that have yet to be presented as amendments to currently adopted plans. These will be proposed below as part of the County-wide highway plan.

Get this revised by Gerner

TABLE 4: SECONDARY ROAD IMPROVEMENTS CONTAINED IN THE SIX-YEAR PLAN OF THE PRINCE WILLIAM COUNTY RESIDENT ENGINEER

MAP NO.	ROUTE	STREET NAME	FROM	TO	YEAR IMPROVEMENT PLANNED	TYPE OF IMPROVEMENT
1	674	Wellington Rd.	28	619	'74	Two Good Lanes
2	642	Davis Ford Rd.	640	610	'73-75	Two Good Lanes
3	663	Davis Ford Rd.	770	642	'73-75	Two Good Lanes
4	646	Aden Road	653	608	'74-80	Two Good Lanes
5	649	Brentsville Rd.	234	619	'74-80	Two Good Lanes
6	776	Liberia Ave.	663	234	'74-80	Two Good Lanes
7	784	Dale Blvd.	640	642	'75-76	Two Additional Lanes
8	643	Spriggs Rd.	640	234	'75-76	Two Good Lanes
9	641 (641/640)	Davis Ford Rd.	253	640/641	'77-78	Two Additional Lanes
10	642	Hoadly Rd.	610	234	'77-78	Two Good Lanes

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Source: V.D.H., Prince William County Residency -FY74

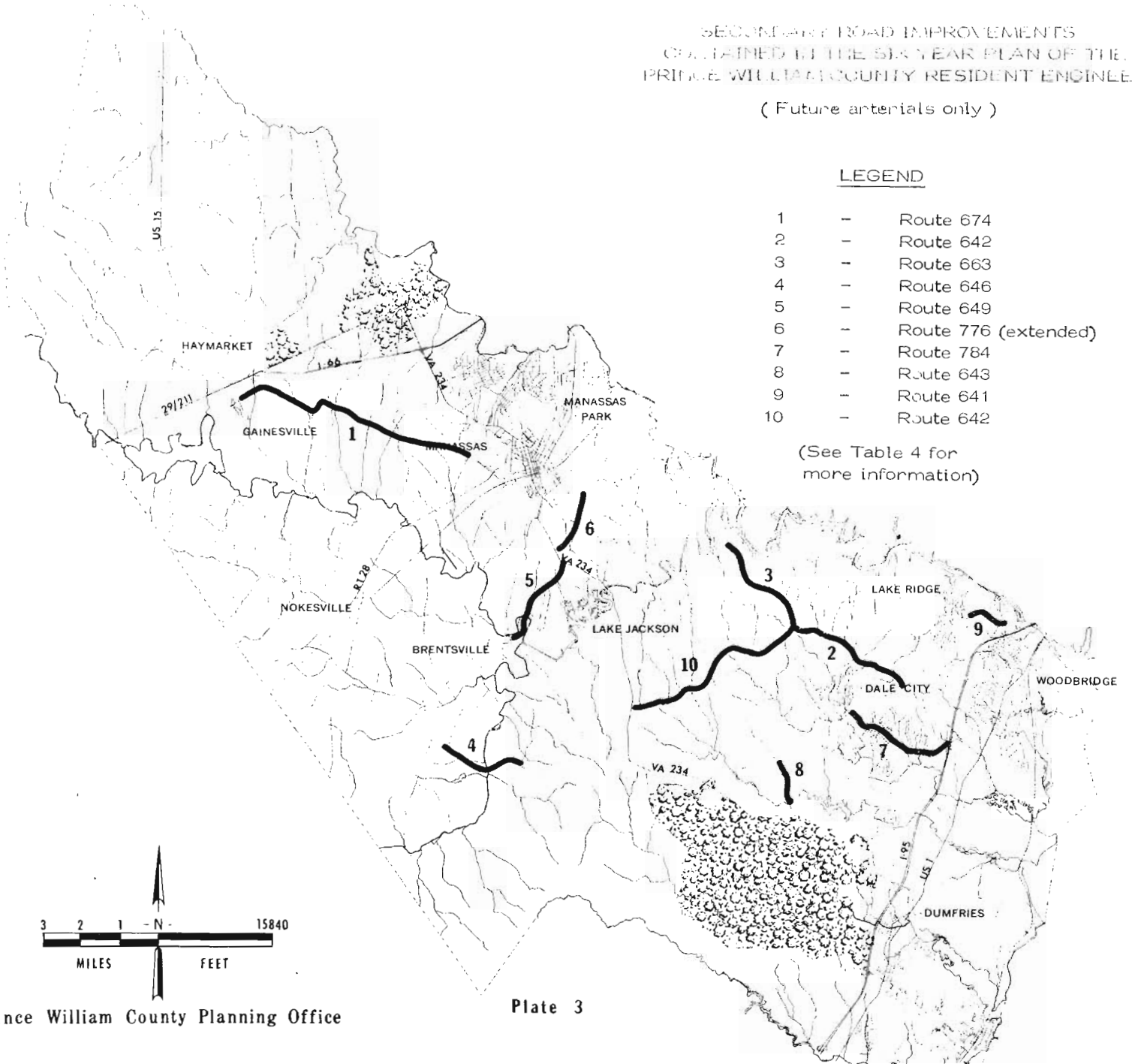


Plate 3

Prince William County Planning Office

2 Proposed Highway Plan

Many of the existing plans for highway improvements are being proposed for adoption as part of this plan. It is hoped that, where conflicts exist with the plans and proposals outlined above, these can be changed to conform to the plan outlined in the following pages.

In order to help establish priorities for improvements, the proposed highway improvements are divided into three categories.

1. Improvements to the transportation system that are needed to correct existing problems.

2. Improvements needed over the next five years to facilitate the five-year comprehensive plan.

3. Long range needs and alternatives.

Because of the general nature of this plan, when discussing highway improvements, only the expressways, interchanges, and arterials are identified. Expressways and arterial roads are defined as follows:

Expressway: A high speed, high capacity limited access highway with grade separations at intersections and no direct access to abutting properties. An expressway is usually a continuous route for regional movement and is not intended for strictly local use.

Arterial Road: Arterials provide access to major commercial or industrial uses, large schools and other major community facilities. Ideally, no direct access is permitted to individual residences. Median breaks are ideally at least 600 feet apart. Arterials usually provide for medium speed travel through developed areas and high speed travel in rural areas. Intersections should be well spaced with signalization and channelization where needed. Service drives may be required in urbanized areas to provide for movement of traffic through congested areas.

Lesser streets, thoroughfares, collectors and local streets may be dealt with in more detailed planning area studies and in further refinements of this County-wide plan. In most instances, streets which are ordinarily built to provide access to individual building sites are not considered part of a transportation plan. The highway element of the recommended plan is designed to meet future needs based on present projections of land use and population. If these projections are unexpectedly altered, however, modification in design, location and staging may be necessary. Periodic updating and re-evaluation of the plan will serve to keep the plan current and help insure optimum balance in the transportation system.

FIRST PRIORITY IMPROVEMENTS NEEDED TO CORRECT EXISTING PROBLEMS

As discussed above, the first category of plans details improvements needed to alleviate the existing problem areas. Each of the following recommended improvements is needed to serve present users and is justified by the current inadequacy of the facility involved. Plate 4 shows the location of these improvements.

1. Dale City Interchange - Stage 1

The existing congestion at this location requires two primary improvements: (1) access ~~must be~~ provided from I-95 ~~southbound into~~ Dale City, and (2) access from Dale Boulevard northbound onto I-95. ACCOMPL.

The off-ramp (1) has been programmed for 1974-1975. To date, the corresponding on-ramp (2) has not been programmed.

Both of these ramps are required as a minimum, and both must be rated as of the highest priority even to serve existing needs.

2. Dale Boulevard - From State Route 642 to Forestdale

Two additional lanes are needed. Parts of Dale Boulevard have recorded about 20,000 vehicle trips per

day. This problem is related to (1) above and requires simultaneous solution. Current plans by the V.D.H. call for this project to be constructed in 1975-1976. The current congestion, danger at intersections and at Ashdale Plaza require a rating of highest priority. When improved to a four-lane arterial, this section of Dale Boulevard should be adequate to serve existing needs of residents in the area in combination with improvements to other secondary roads surrounding Dale City.

3. Route 28 from Manassas Drive to Fairfax County Line

Designed to accommodate 4,000 vehicles per day, a V.D.H. traffic survey conducted in 1972 showed 16,625 vehicles per day on this two-mile section of Route 28. The V.D.H.'s 1972 - 1982 Highway Plan for primary and urban construction projects lists Route 28 between Manassas Park and Route 29 in Fairfax County as being upgraded to four lanes with 3.2 million dollars planned to finance this improvement.

In order to accomplish the upgrading of Route 28, a group of citizens in the Yorkshire area are constituting a program to encourage land owners along Route 28 to donate the necessary land for a 70-foot right-of-way. In the 1973 - 1974 fiscal year primary road budget, V.D.H. has allocated $250,000 to begin engineering work on Route 28. Every effort must be made to secure the upgrading of this section of Route 28. Until this is completed, a number of policies to control land use on this section of Route 28 should be adopted to prevent further deterioration of this facility and to provide the needed right-of-way wherever new development takes place.

4. Route 1 - From Possum Point Road to Fairfax County Line - Upgrading to Four-Lane Divided

This facility is currently loaded beyond its capacity and contains numerous dangerous intersections. Over 20,000 vehicle trips per day were recorded on some sections in 1972. In addition provisions are inadequate for left turns across traffic into many commercial developments.

This road, which originally served as the primary north-south route for regional travel, now essentially serves local traffic, mostly associated with shopping trips.

The proposed upgrading does not appear in the 10-year needs program for primary roads of the Virginia Department of Highways, and therefore is not contemplated by that agency in the 1972 - 1982 period.

However, traffic counts and accidents on this facility indicate that, until upgrading is accomplished, policies should be adopted to control land use in the Route 1 Corridor so that at a minimum, further deterioration of this facility does not occur, and so that needed right-of-way and frontage improvements will be made when properties fronting on Route 1 are developed.

5. Route 663/642 (Davis Ford Road) from Occoquan Forest to Route 640

The V.D.H. currently has plans to upgrade Davis Ford Road from the Ravenswood Bridge to Route 640 to two lanes of an ultimate four-lane roadway. The V.D.H. has divided this improvement into two projects. Construction from Route 640 to Hoadley is scheduled to begin in the summer of 1973. Construction of the second project (Davis Ford Road from Hoadley to the Ravenswood Bridge) is programmed to begin in 1974. Current traffic counts on Davis Ford Road from Hoadley to the Ravenswood Bridge are approximately 2,500 vehicles per day. From Hoadley to Route 640, Davis Ford currently has approximately 5,300 vehicles per day.

The V.D.H. has not programmed four-laning these sections of Davis Ford Road, even though the necessity for four lanes in the future is recognized. The upgrading of these sections of Davis Ford Road to two good lanes will be sufficient to alleviate the existing problem and will provide an excellent route between the Manassas and Woodbridge areas. However, due to development nearby, the section of Davis Ford Road from Hoadley to Route 640 will undoubtedly experience markedly increased traffic counts during the next five years. Policies should be adopted so that the needed right of way is provided as development takes place.

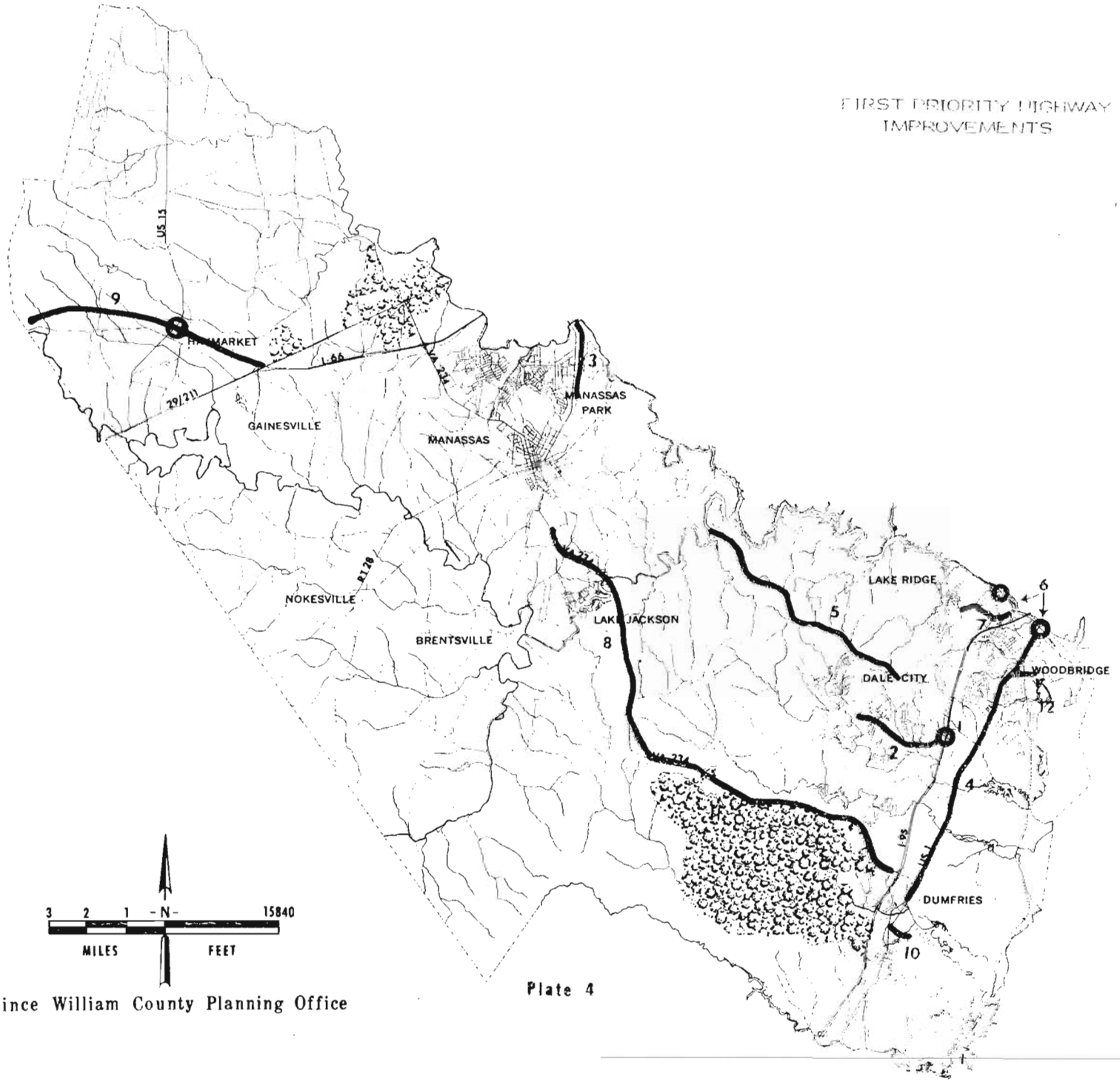


Plate 4

Prince William County Planning Office

6. Route 1 and Route 123 Bridges - Reconstruction

The bridges destroyed by Agnes will be replaced. The bridge at 123 is well under way on a new alignment and reconstruction of the bridge at Route 1 will occur in the near future.

7. Route 640/641 (Davis Ford Road) - Arterial Construction Between Lake Ridge and Gordon Boulevard

This route was, in 1972, carrying almost 11,000 cars per day, most of it as commuter traffic. Back-ups on I-95 frequently extended across the I-95 Bridge into Fairfax County during the evening rush hour, creating a highly dangerous situation. The back up is created by the restraint of left turn movement from Route 123 onto Davis Ford Road.

Immediate action is needed to improve the intersection of Gordon Boulevard and Davis Ford Road with medians, left-turn lanes and free flow right-turn lanes. Davis Ford Road should be up-graded to a four-lane arterial with a center turning lane between Gordon Boulevard and Occoquan Road and to a four-lane divided arterial between Occoquan Road and Old Bridge Road. The intersection at the entrance to the Lake Ridge RPC should be rebuilt according to the V.D.H. functional plan for this intersection.

Whenever development takes place along this road, the developers should be responsible for construction of these improvements. See "Third Priority Highway Improvements" for additional improvements needed for the future in this area. Policies should be adopted to obtain or reserve the necessary right-of-way and to ensure that the improvements are built as development takes place along this road.

8. Route 234 - Arterial Construction from Manassas to Route 642 (Hoadley Road)

This facility is the only existing primary route between the County's two developed areas. Between Hoadley Road and the Town of Manassas, traffic counts averaged 7,660 vehicles per day in 1972. The V.D.H.'s 1972 - 1982 Roads and Streets Plan does not include any financing for Route 234 to be upgraded. There is a need for an improved east-west arterial roadway connecting the eastern and western parts of Prince William County. As these two areas continue to develop, there will be increased need for this improvement.

9. I-66 Extension from Gainesville to Fauquier County Line

One of the two interstate highways which runs through Prince William County is I-66. Presently, I-66 begins at the Capital Beltway and runs westward to Gainesville, although several sections of I-66 have been constructed farther to the west. I-66 is planned to be extended eastward to Washington, D. C. and westward from Gainesville to Fauquier County. The right-of-way for this extension through Prince William has been acquired. One additional interchange on this section of I-66 has been planned in Prince William. This interchange is located near Haymarket on Route 15.

The interchange at Route 15 and I-66 should be built initially as a diamond interchange, but right-of-way should be obtained immediately by the VDH for the construction of a full cloverleaf interchange in the future.

10. Route 1107 Graham Park Road - Arterial Construction from Route 1 to Graham Park School

Construction of apartments and townhouses in this area will soon require up-grading of Graham Park Road to arterial standards.

11. Route 234 - Arterial Construction between Route 642 and I-95

First priority improvements included construction of Route 234 to arterial standards between Manassas and Route 642. The remaining sections of Route 234 should also be completely four laned in this period. Development along Route 234 such as Country Club Lake may have already four-laned portions of Route 234, so that it will be mainly a matter of filling in the gaps by the Virginia Department of Highways.

12. Access from Marumsco Creek Park to Route 1

Roadway providing access over the R F & P Railroad tracks in order to connect Belmont, Featherstone, the industrial park, federal government property, and Marumsco Creek Park to U. S. Route 1. (under study)

SECOND PRIORITY IMPROVEMENTS NEEDED TO SUPPORT DEVELOPMENT DURING NEXT FIVE YEARS

The second category of planned improvements assumes that the five year comprehensive plan will require the construction of new facilities, as well as the upgrading of existing facilities, in order to support projected development during this period. Projected development includes almost exclusively presently zoned areas. Plate 5 shows the locations of these improvements.

1. Dale City Interchange - Stage II

As cited earlier, new on and off ramps connecting Dale Boulevard and I-95 are required now, as are two additional lanes of Dale Boulevard from Forestdale to Route 642. During the next five years there is a possibility that a large regional shopping center will be built adjacent to the interchange. If this should occur, a full interchange would be required at that time.

Demand will continue to rise from residential development in the area over the next five years. However, if a shopping center is not built and the two connections to Dale Boulevard are completed, then upgrading of this interchange beyond Stage II may not be needed in the five year period.

2. Route 28 Bypass

The Route 28 Bypass has long been advocated by Prince William County. It is shown on the 1968 adopted Manassas Planning Area Plan. It is in the 1972 - 1982 V.D.H. Ten Year Highway Plan to build a two lane facility on a four-lane right-of-way. V.D.H. has projected $3,950,000 in the ten year plan for this facility, including improvements in Fairfax County. It has already secured most of the right-of-way for the facility. The Route 28 bypass has recently been proposed to become an expressway, but further study in cooperation with Fairfax County and V.D.H. is necessary before this road is changed to an expressway. Traffic projections indicate that a grade separated interchange will be necessary at Route 234 due to the heavy volumes of traffic on Route 234. The Route 28 bypass is shown on the COG 1973 FHWA Plan. It is shown as a controlled major arterial on this plan.

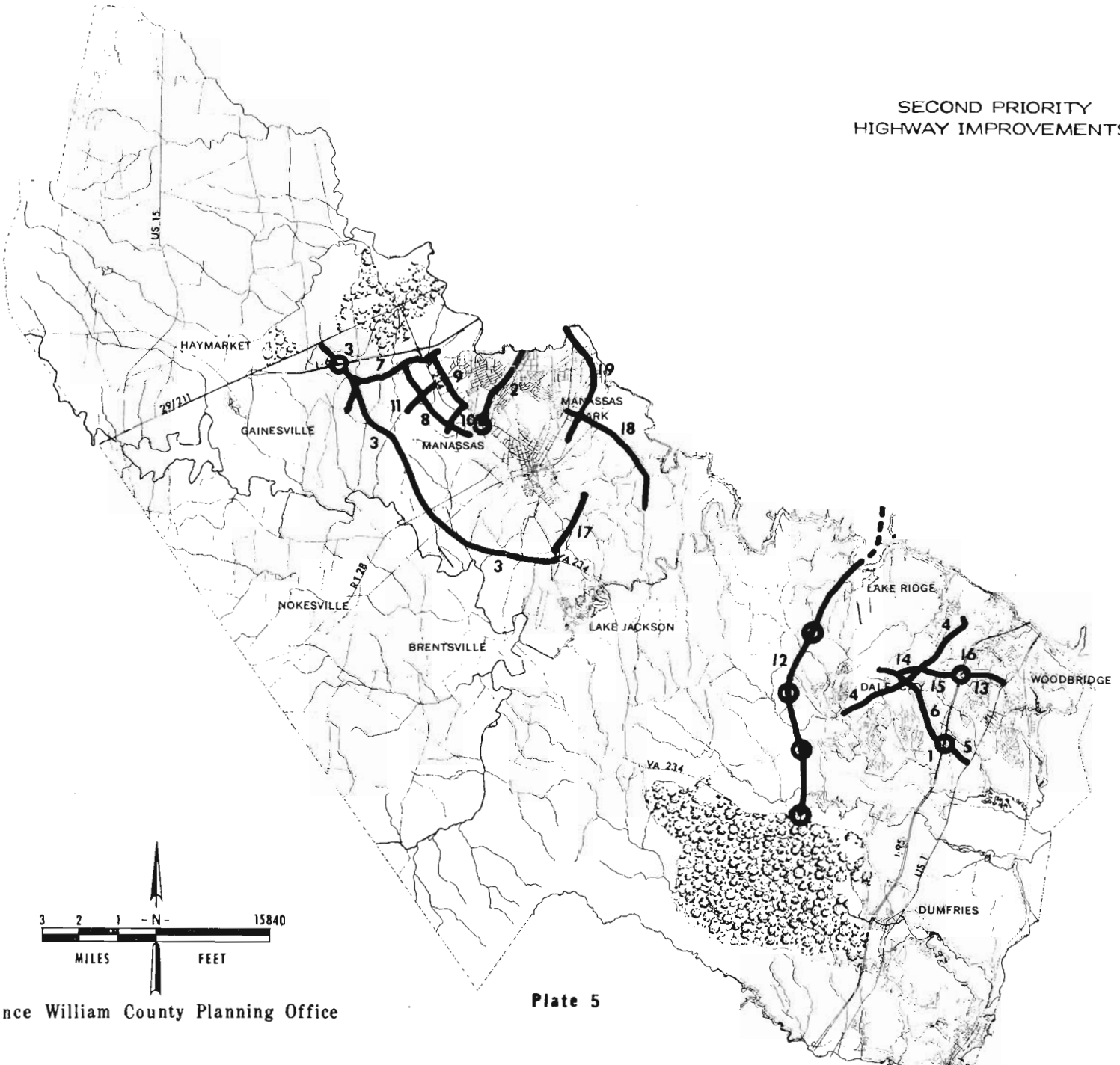
3. Route 234 By-Pass + I-66 Interchange

A major link in the entire Manassas Transportation System is the construction of a new arterial, part of which was formerly known as the Western Manassas Loop, extending from Route 234 south of Manassas to a new interchange on I-66. This road has been called the Route 234 By-Pass. The V.D.H. has engineered"functional plans" on certain segments of this road. V.D.H. funds for the facility have not been allocated. Recently, and primarily because of the Marriott Corporation's rezoning of land for industrial and amusement parks, the V.D.H. has been working on plans to engineer an interchange on I-66 which the Marriott project could utilize . Funding for the project has not been determined. Policies should be adopted that will insure the preservation of the needed right-of-way for this road and future interchange.

4. Route 640 (Minnieville and Davis Ford Roads) - Arterial Construction from Forestdale Apartments to Lake Ridge

This section should be constructed to a four-lane arterial within the next five years. The current road is now carrying approximately 9,000 vehicles per day. The expected construction of a large community shopping center at the intersection of Routes 640 and 642 will increase the demand. Continuing residential construction in the Lake Ridge and Dale City areas will be even more instrumental in increasing traffic volumes.

SECOND PRIORITY
HIGHWAY IMPROVEMENTS



Prince William County Planning Office

Plate 5

5. Route 642 (Smoketown Road) - Arterial Construction on New Alignment from I-95 to Route 1

This segment of Route 642 was carrying in 1972 over 13,000 vehicles per day. The development of a major commercial center on the property between Route 1 and I-95 should be accompanied by construction of this new road to arterial standards by the developer. Relocated Weeks Road should also be constructed in like manner, between Route 642 (relocated) and Opitz Boulevard, close to the Potomac Hospital.

6. Route 642 (Smoketown Road) - Arterial Construction from Route 640 to I-95

Route 642 was carrying in 1972 close to 5,000 vehicles per day between Route 640 and Dale Boulevard. This volume is expected to increase due to the new high school and commercial and residential development proposed along Route 642, in addition to through traffic demands. The four laning should be accomplished mainly by developers having frontage on this Route.

7. Balls Ford Road from Route 674 to Point east of Route 234

Both Ashton Avenue and Williamson Avenue terminate at Route 621 (Balls Ford Road). Therefore, it is proposed that Route 621 be improved to a four lane arterial from Route 674 to a point east of where Williamson Avenue intersects Route 621. The Route 621 improvement should be shared by developers making use of this road and by the V.D.H. It should be completed in coordination with the northern sections of Ashton Avenue and Williamson Avenue.

8. Ashton Avenue - New Arterial

In April of 1973, the adopted Manassas Plan was amended. The transportation system in the Route 234 Corridor north of the Town of Manassas was amended because the adopted transportation system in the Route 234 Corridor was inadequate. One of the backbones of this newly adopted transportation system is Ashton Avenue. Planned as a four-lane divided arterial class road, Ashton Avenue is west of, and runs roughly parallel to Route 234. Ashton Avenue extends from Route 668 in Manassas and runs north to Route 621. When built, this road will serve the high density residential area west of Route 234. To be built by developers, it may be almost complete by the end of the next five years.

9. Williamson Avenue - New Arterial

A second major arterial outlined in the Route 234 Corridor amendment of April, 1973 is Williamson Avenue. Planned as a four-lane divided arterial class road, Williamson Avenue is east of and runs roughly parallel to Route 234. Williamson Avenue extends between Portsmouth Road and Route 621. When built, this road will serve the large amount of commercial land east of Route 234. To be built by developers, it may be almost complete by the end of the next five years.

10. Portsmouth Extended - New Arterial

A third roadway which is an integral part of the Route 234 Corridor system is an arterial running east-west between Ashton Avenue and Williamson Avenue. This facility would be built by developers as development takes place.

11. Sudley Manor Drive, Terminating at the Paradise Tract

Another part of the Route 234 Corridor transportation system is Sudley Manor Drive Extended, from Route 234 westward through the Paradise tract. Like Ashton Avenue and Williamson Avenue, it is proposed that this road be built by developers whose developments would utilize the road. Although included in this section on five-year needs, it is not certain that it will be built within the time-frame of the Five Year Comprehensive Plan. The road will utilize an at grade intersection with Route 234.

12. Ridgefield Road

This major facility will connect eastern Prince William with the proposed Outer Beltway and the Northern Virginia Expressway in Fairfax County. Ridgefield Road is conceived as an alternative to I-95 for commuter traffic

to and from Northern Virginia and other parts of the Washington Metropolitan area.

Interstate 95 is quickly reaching the saturation point. Traffic counts in the Woodbridge area in 1972 approached 60,000 vehicles per day. It is expected that the next five years will see continued increases in traffic. Ridgefield Road, when constructed, will help to relieve I-95 of commuter and other traffic originating in eastern Prince William and, perhaps, farther south.

In any event, however, considerable expansion of mass transit services will be necessary to adequately serve the commuting needs of eastern Prince William. In the event that mass transit proves successful, then Ridgefield may be built at lesser standards than those of an expressway. Exclusive bus lanes should be considered for this facility as well as for I-95.

The alignment currently accepted by the Virginia Department of Highways runs from Route 234 adjacent to Country Club Lake north through Dale City across the Occoquan and into Fairfax County. It continues to the proposed Outer Beltway and then to the proposed Northern Virginia Expressway. The advantage of this alignment is that it does not require a new interchange on I-95 and reflects the concern of the Federal Highway Administration that new interchanges on the interstate will hasten use beyond the road's capacity. However, this will put greater pressure on Route 234 and its interchange on I-95. It will have to be constructed mainly by the V.D.H., and may initially be constructed as a two-lane facility, to be expanded to four lanes in a later period. No hint of funding for this facility has been received from the V.D.H. although the V.D.H. has supported fully the planning for the Ridgefield Road. Interchanges will be needed at the major arterial intersections.

It should be noted that while this road is needed to serve eastern Prince William, the planning and eventual construction of it will put great pressure for development on this portion of the County. These pressures are likely to be felt well before Ridgefield Road is ever constructed.

13. Lancaster Boulevard - New Arterial Connecting Route 1 at Longview Drive to Horner Road near I-95

This link would constitute an improvement to a portion of Longview Drive west of Route 1 and construction of a new road through the planned Lancaster Apartments area to Route 639 by developers. Associated arterial connectors to Marumsco Village and Marumsco Hills will also be required. This arterial will constitute the easternmost section of an arterial connection between Route 1 in Woodbridge and the Manassas Loop, making use of portions of Routes 639, 642, and 663. In approving the Transportation Plan, the Board of Supervisors instructed the Planning staff to review this proposal, and to make additional recommendations after additional studies are completed as to whether this planned road should be retained, modified, or deleted.

14. Route 639 and Route 642 - Arterial Connections in Area of Bethel

These improvements will be necessary to provide through movement and to carry traffic to and from the commercial and residential areas that have been zoned in the Bethel area. These roads will be constructed mainly by developers.

15. Route 639 (Horner Road) Between Route 640 and I-95

In 1972, parts of this road carried over 5,000 vehicles per day. As traffic counts increase, this link should be rebuilt to a good two lane facility on an alignment that would be satisfactory for eventual four-laning.

16. Bus Ramps on I-95 at Horner Road (Route 639)

It is proposed that bus ramps be constructed for access to and from I-95 at this point exclusively for transit vehicles. ~~A full use interchange is proposed for a later period, if approved by State and Federal highway officials.~~

17. Liberia Avenue Extended (Route 776) to Route 234 (South of Manassas)

County plans for the Manassas area have long included the concept of a "Loop Road" around Manassas. Part of this "Loop Road" has been constructed. From Route 28 south-east to Route 663 (Davis Ford Road), two lanes of an eventual four-lane arterial are already constructed. Known as Liberia Avenue, this road is designated Route 776 by the Virginia Department of Highways.

18. Manassas Drive Extended to Davis Ford Road

Manassas Drive extended, from Route 28 to an interchange with the future Monticello Freeway and to Route 663 (Davis Ford Road). From Route 28 through Manassas Park Village, the developer is currently building a four-lane arterial highway, while the developer of Pinewood Garden is continuing two lanes of the arterial through his development to Euclid Avenue extended. Although construction of the Monticello Freeway is well into the future, the plan proposes extending Manassas Drive to Davis Ford Road.

19. Euclid Avenue Extended to Fairfax County Line

A new arterial, beginning as Euclid Avenue in Manassas and extending up to the Fairfax County line to include much of Lake Drive along Bull Run has been adopted as a second priority need. This arterial could act as an alternative to the up-grading of Route 28 through the Manassas Park and Yorkshire areas. If constructed, this arterial would perhaps tend to cause increased development and even re-development in the Yorkshire area. Depending on what is accomplished on Route 28 and on the Route 28 By-pass, a lesser road may eventually be found adequate.

Arterials - general

Arterials that will be constructed in major developments in Prince William County include Dale Boulevard in Dale City, Lake Ridge access to Ridgefield Road, Old Bridge Road in Lake Ridge, extension of relocated Route 642 in Rippon Landing, and other arterials in other developments that will be necessary to carry the traffic generated. These should all be built by the developers.

THIRD PRIORITY IMPROVEMENTS: LONG RANGE NEEDS

In order to assure that the county's future transportation needs will be met, adequate long range transportation planning must be undertaken. Because of this, a third category of plans, outlining long range needs and alternatives is presented. The reasons for this approach are several. First, by outlining major projects and alternatives well in advance, there is still time for the county to evaluate and analyze their impact.

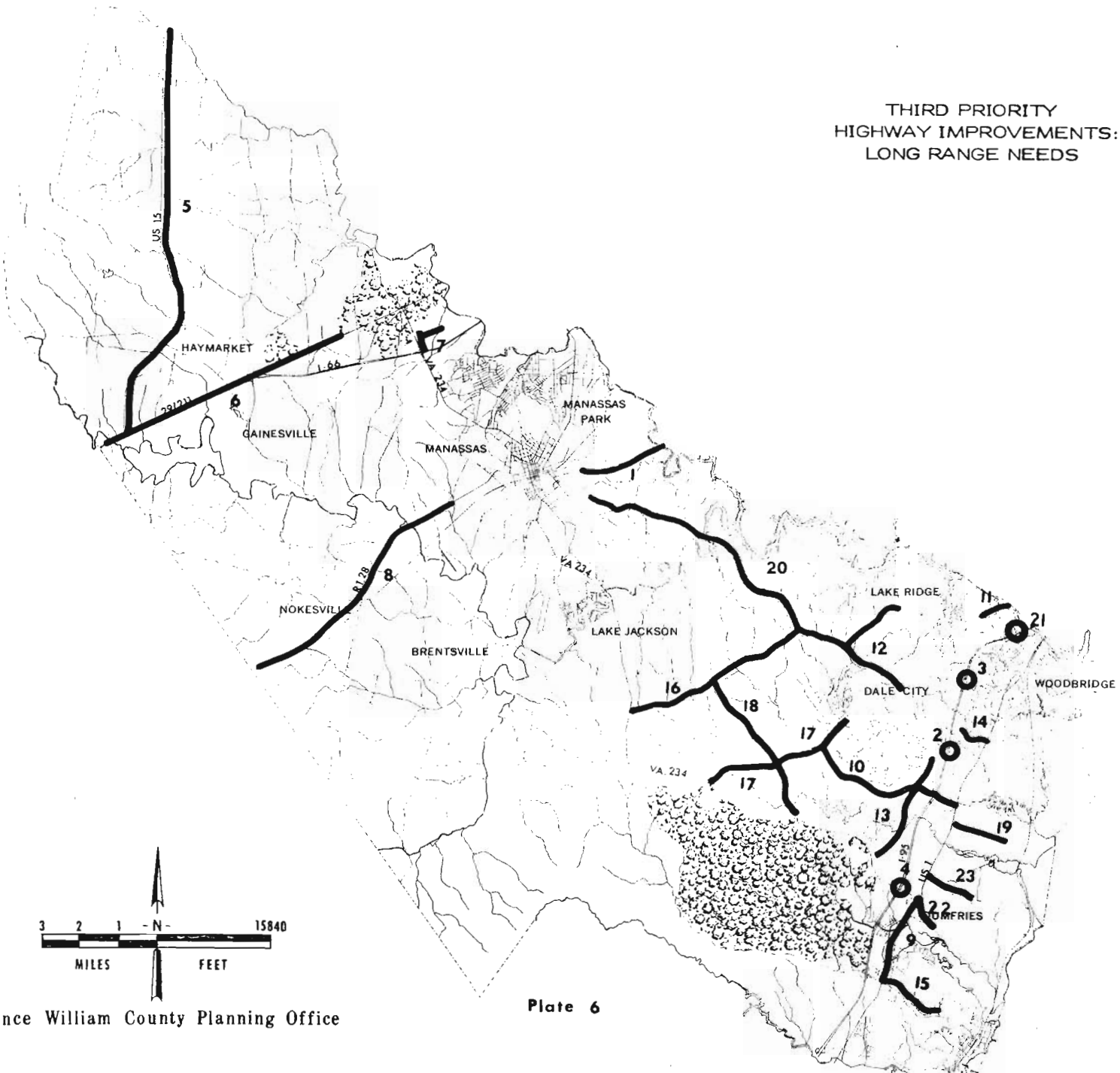
Secondly, construction of major transportation facilities require a great deal of lead time as well as substantial amounts of funds. Often major transportation facilities are planned through interaction of a number of governmental levels, (i.e. State, Regional, Federal and Local). Besides taking time, there is also a need for close cooperation among these governmental units. For example, if an outer beltway is to be constructed, all the suburban counties of the Washington area will be substantially affected. It is in Prince William's best interest to participate as fully as possible in planning for such significant changes in regional transportation patterns.

Major improvements programmed far in the future also have implications for the present. For example, the alignment, or even the existence of a future road may be jeopardized if right-of-way is not reserved or acquired from development occurring in its path. It is for these reasons that the plan currently outlines long range needs or third priority needs.

It should be noted that while some of the projects are designed to serve primarily local needs, a few of the major facilities discussed would - if built - have far greater implications for the overall future of the county. Third priority improvements are shown on Plate 6.

1. Monticello Freeway

An element of the Council of Government's regional plan, this highway would provide a direct connection to the Capital Beltway (I-495).



Prince William County Planning Office

Plate 6

This highway was the subject of studies as far back as 1948. It was originally conceived to be a road connecting the Jefferson Memorial with Monticello, in Charlottesville. The divergence of I-95 and I-66 away from Washington is such that the provision of the Monticello Freeway may be necessary. Fairfax County planners have indicated the need for this route in their county. Present thinking is that it will not extend beyond Manassas and that it may not be an expressway but an arterial road between Manassas and the Outer Beltway in Fairfax County.

However, it is most important to note that by endorsing the Monticello Freeway concept, the county is thereby accepting the inevitable fact that by providing added access to the metropolitan area, there will be increased pressures to develop the Buckhall/Signal Hill section of the county which will be transversed by this road. The Monticello Freeway is currently shown on the COG 1973 FHWA Certification Plan. It is shown as a controlled major arterial on the COG plan.

2. I-95/Dale City Interchange -Ultimate Design

A plan for the ultimate development of the Dale City Interchange on I-95 has been adopted by the Board of County Supervisors. Because of recent zoning action and further study of the future demands, the Board has requested that the plan be re-evaluated and revised, if necessary to handle projected traffic under full development. The revised plan will probably involve expansion of the arterial road net close to the interchange as well as the interchange itself. The need for this interchange and related improvements must be recognized at this time. The plan itself will be added as an amendment to this plan as soon as it is prepared and adopted.

3. I-95/Horner Road Interchange - Construction

Bus ramps at this location were among the "Second Priority Improvements" proposed above. It is proposed here that, ultimately, a full service interchange will be constructed at this location. This interchange is shown on the adopted Woodbridge Planning Area and the adopted Routes 640-641-642 Corridor Study Development Plans.

4. I-95/Route 234 Interchange - Improvements

Two additional clover leaves should be constructed at this interchange. The need for these ramps was anticipated in the design for the existing interchange.

5. Route 15 - James Madison Highway

Route 15 from Route 29-211 to the Loudoun County line is in no immediate need of upgrading. In 1970, traffic counts on this primary road were approximately 2,000 vehicles per day. Although not listed to be upgraded in Prince William in the 1972-1982 V.D.H. Highway Plans, sections of Route 15 in Loudoun County are to be upgraded to four lanes.

6. Route 29-211 - Lee Highway

Routes 29-211, or Lee Highway, is not in need of immediate upgrading. Between the Prince William/Fairfax County Line to where Route 66 now terminates, average daily traffic counts on 29-211 are approximately 3,300. After Route 66 ends, traffic counts on Route 29-211 rise to approximately 15,000 vehicles per day. Currently the V.D.H. Ten Year Plan does not include upgrading this primary facility, as most of Routes 29-211 in Prince William County is a four-lane arterial. Only safety improvements will be made on Routes 29-211 in the future by the V.D.H. It will be necessary to maintain traffic capacities by requiring well-spaced entrances, service drives and additional lanes wherever development fronting on Routes 29-211 takes place. No widening is proposed through the Battlefield Park. This would significantly injure the historic values of the Battlefield Park.

7. Route 234 - From I-66 North to Routes 29-211

Route 234, Sudley Road from Manassas to Route I-66 is currently four-laned. This section of Route 234 is heavily travelled, with existing traffic counts of up to 29,000 vehicles per day. Because of the heavy volumes of traffic along this section of Route 234, every effort should be made to continue to limit the number of crossovers and access points on this arterial to the number outlined in the V.D.H. standards. Hopefully, as development

occurs, Ashton Avenue and Williamson Avenue will be built, helping to alleviate the ever increasing traffic congestion on Route 234.

North of I-66, Route 234 is a two-laned facility. Because the majority of this section of Route 234 transverses the Manassas Battlefield Park, little or no development will occur on this section of Route 234 and therefore there is little need to upgrade this facility to four lane arterial standards. Between the Northern Virginia Community College campus and I-66, however, four lanes will probably be needed, as well as an arterial intersecting this section of Route 234 from the east.

8. Route 28 South-West of Manassas to Fauquier County Line

Route 28 south-west of Manassas is currently a two lane roadway. These two lanes are planned to be part of an ultimate four-lane arterial. V.D.H. has not programmed any time in the future for the four-laning of this section of Route 28. Currently, traffic counts on this section of Route 28 are not great enough to require any upgrading in the immediate future.

9. Route 1 - Arterial Construction between Route 234 and Route 619

Minor improvements to this portion of Route 1 will hopefully enable it to carry the gradually increasing amounts of traffic projected for at least ten years. In the long range picture, however, it will be necessary to complete improvements on this section. Also four lanes for through traffic will be needed, with median and left turning lanes. The one-way portions of Route 1 are expected to remain, but with improved cross-over capability.

10. Route 610 (Cardinal Drive) between Route 640 and Route 1

An improved Rte. 610 from Rte. 640 to Rte. 1 would serve the high density areas of Dale City near I-95, the Country Club Lake area, and anticipated development east of I-95 and east of Route 1. East of Route 1, this new arterial would be built by developers at a future date. First phase construction would be a two lane road on an alignment suitable for four lanes. The full four lanes would be built later.

11. Route 640 (Tanyard Hill Road) - New Arterial on New Alignment Between Route 641 (Davis Ford Road) and Route 123 in Town of Occoquan

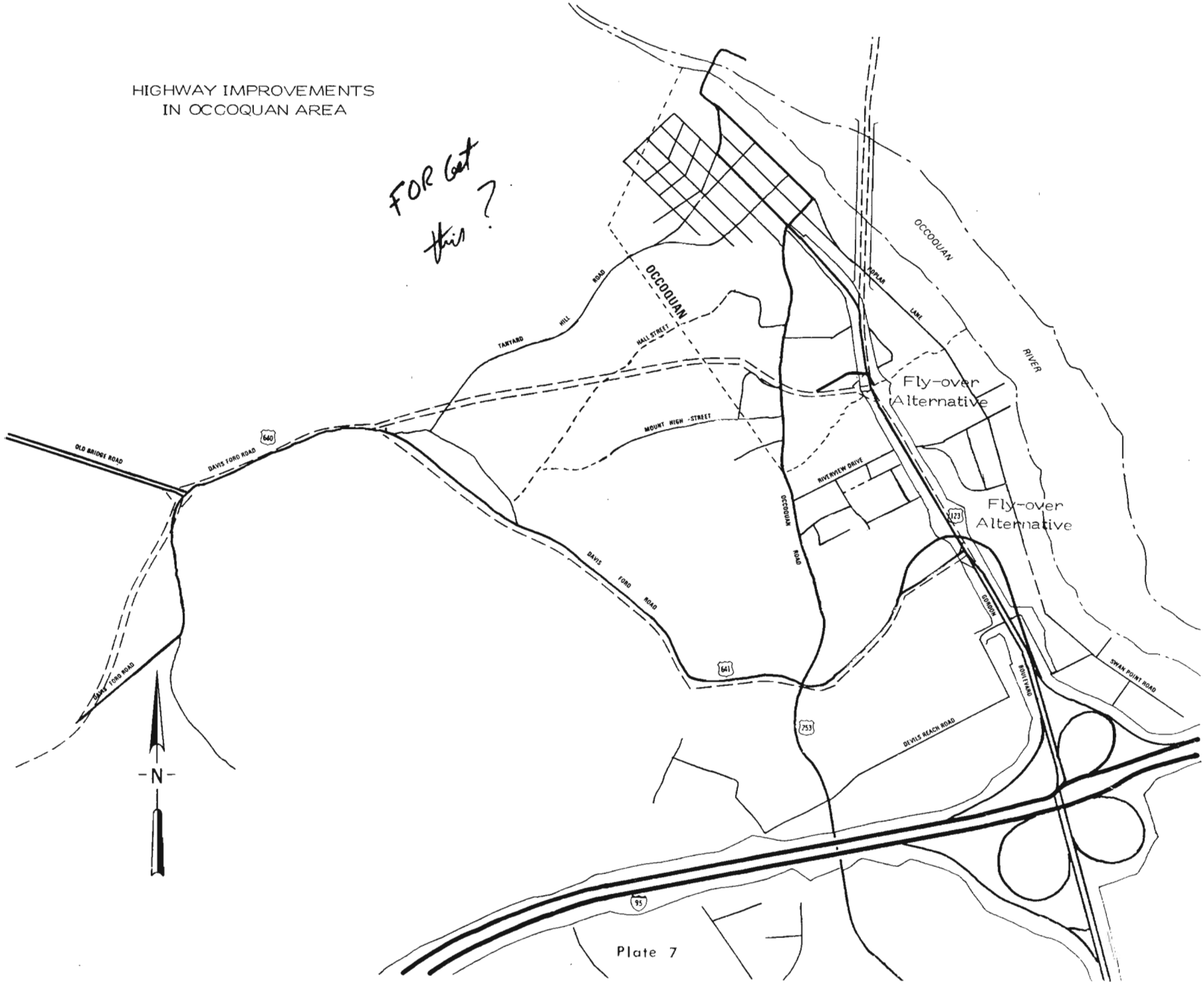
The adopted "Routes 640-641-642 Corridor Study" shows this new road connecting Davis Ford Road to Gordon Boulevard on the east side of the Town of Occoquan. This facility will be necessary to provide adequate service for future development of the Lake Ridge area. A special intersection, with perhaps a fly-over for free flow left turns from Route 123 northbound, will be needed. An alternate location for a fly-over ramp would be the intersection of Route 123 with Davis Ford Road, several thousand feet to the south, toward I-95. Plate 7 shows the features proposed.

12. Route 641 (Old Bridge Road) - Arterial Construction between Lake Ridge RPC and Route 642

This part of Route 641 will be needed as a four-lane arterial to serve as a link between the Lake Ridge/Occoquan area and the Route 642/663 corridor to Manassas. Future development in the area will also create the need for a road of this type.

13. New Arterial West of I-95 between Route 234 and Dale Boulevard

This arterial will be necessary for through traffic and to provide for future development in the area traversed. Continued study is needed to determine how this road can connect to Dale Boulevard and Route 610. If the I-95 interchange with Route 610 cannot be constructed and if a satisfactory plan for the I-95 interchange at Route 642 cannot be implemented, this road should not be built between Route 610 and Dale Boulevard in order to avoid unbearable congestion on Dale Boulevard.


HIGHWAY IMPROVEMENTS
IN OCCOQUAN AREA
FOR Get this ?
OCCOQUAN
TAXYARD HILL ROAD
HALL STREET
POPLAR LANE
OCCOQUAN RIVER
Fly-over Alternative
MOUNT HIGH STREET
OLD BRIDGE ROAD
DAVIS FORD ROAD
640
RIVERVIEW DRIVE
OCCOQUAN ROAD
123
Fly-over Alternative
DAVIS FORD ROAD
641
GORDON BOULEVARD
SWAN POINT ROAD
753
DEVILS REACH ROAD
-N-
95
Plate 7

14. Opitz Boulevard

It is anticipated that Opitz Boulevard will become a major connection between Route 1 and the future Dale City I-95 interchange area. In addition to serving through traffic, it will also serve the hospital and other anticipated developments.

15. Fuller Road/Fuller Heights Road (Route 619) - Arterial Construction

The area east of Triangle and adjacent to the Quantico Marine Corps Base has already undergone some development, with more anticipated in the future. Fuller Heights Road now carries over 6,000 vehicles per day in one section. An arterial is needed in this area. This will require cooperation among the Base, the County and the Virginia Department of Highways.

16. Route 642 (Hoadly Road) - Arterial Construction between Hoadly Road and Route 234

17. Route 640 (Minnieville Road) - Arterial Construction between Dale City and Route 234

18. Route 643 (Spriggs Road) - Arterial Construction between Route 234 and Route 642

These arterials will be needed for through traffic and to serve future developments in the areas traversed by them. Two lanes of eventual four lane roads should be built first.

19. Freestone Point Arterial, east from Route 1

As shown on the adopted Powells Planning Area Development Plan, an arterial road is required from Route 1 eastward toward the Potomac River. This road, as well as other new roads east of Route 1, must be built entirely by developers whose properties the roads are to serve.

20. Davis Ford Road - Arterial Construction between Manassas and Route 640

21. I-95 Interchange with Route 123 - Improvements for handling traffic exiting from I-95 onto Route 123

22. Route 234

Extend eastward from Route 1 to connection with Possum Point Road.

23. Cherry Hill Road

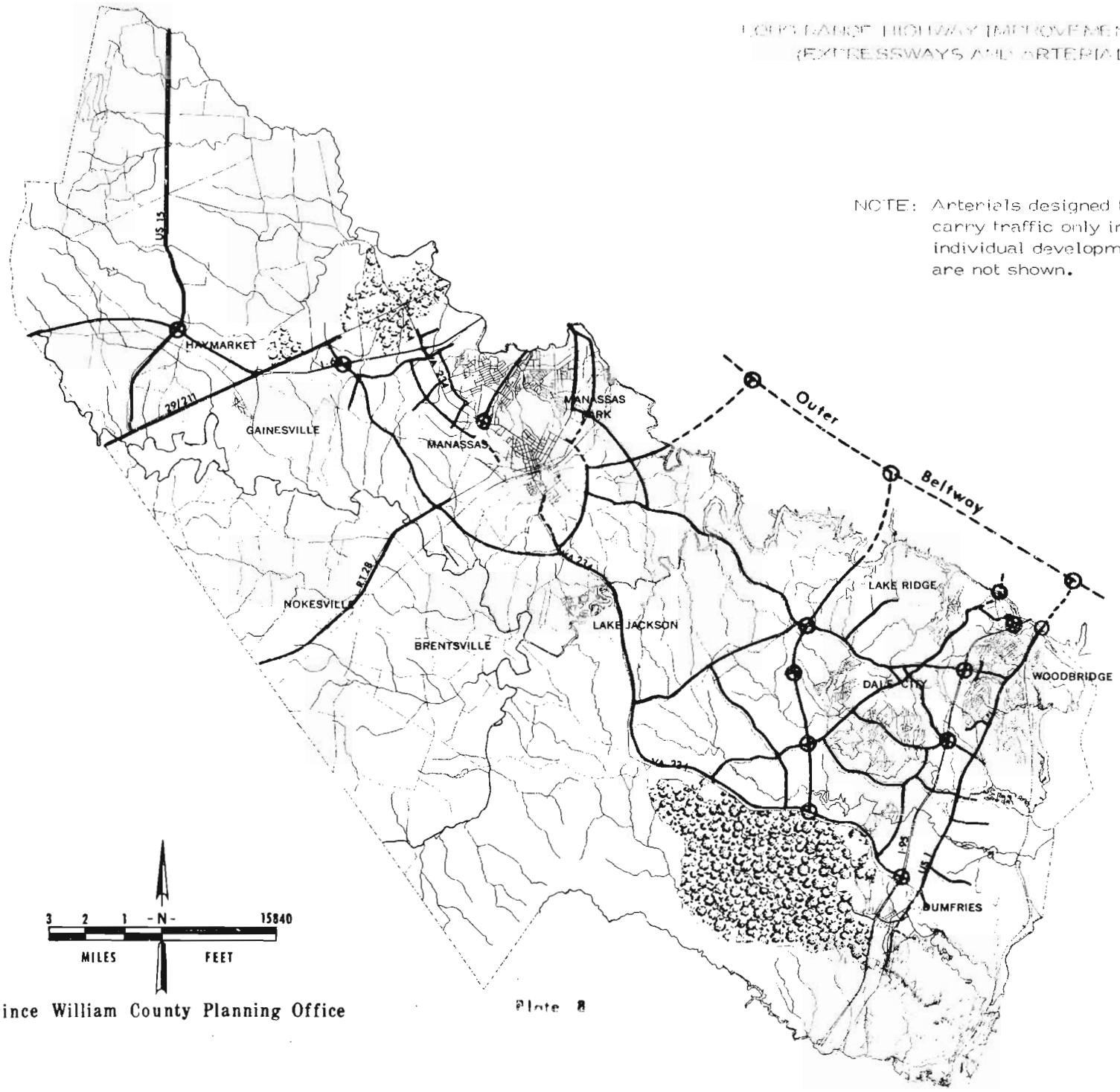
Improve Cherry Hill Road from Route 1 eastward to rural two lane thoroughfare standard.

Summary - Highway Element of Transportation Plan

The Highway Element of the Transportation Plan has divided major highway improvements into three categories. The first category describes improvements which are needed immediately to ameliorate the existing problem areas outlined in Section 1 of the Comprehensive Plan. The second category outlines improvements needed to handle traffic from anticipated development during the next five year period. The third category entitled Long Range Needs and Alternatives, presents improvements which should be built in a later period, after additional evaluation of the County's ongoing transportation planning process.

In order to summarize the Highway Element, Plate 8 shows the complete long range highway improvement plan for expressways and arterial roads. Table 5 lists the three categories of recommended improvements.

LONG RANGE HIGHWAY IMPROVEMENTS PLAN
(EXPRESSWAYS AND ARTERIALS)



NOTE: Arterials designed to carry traffic only in individual developments are not shown.

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MILES FEET

Prince William County Planning Office

Plate 8

TABLE 5

SUMMARY OF HIGHWAY ELEMENT OF TRANSPORTATION PLAN

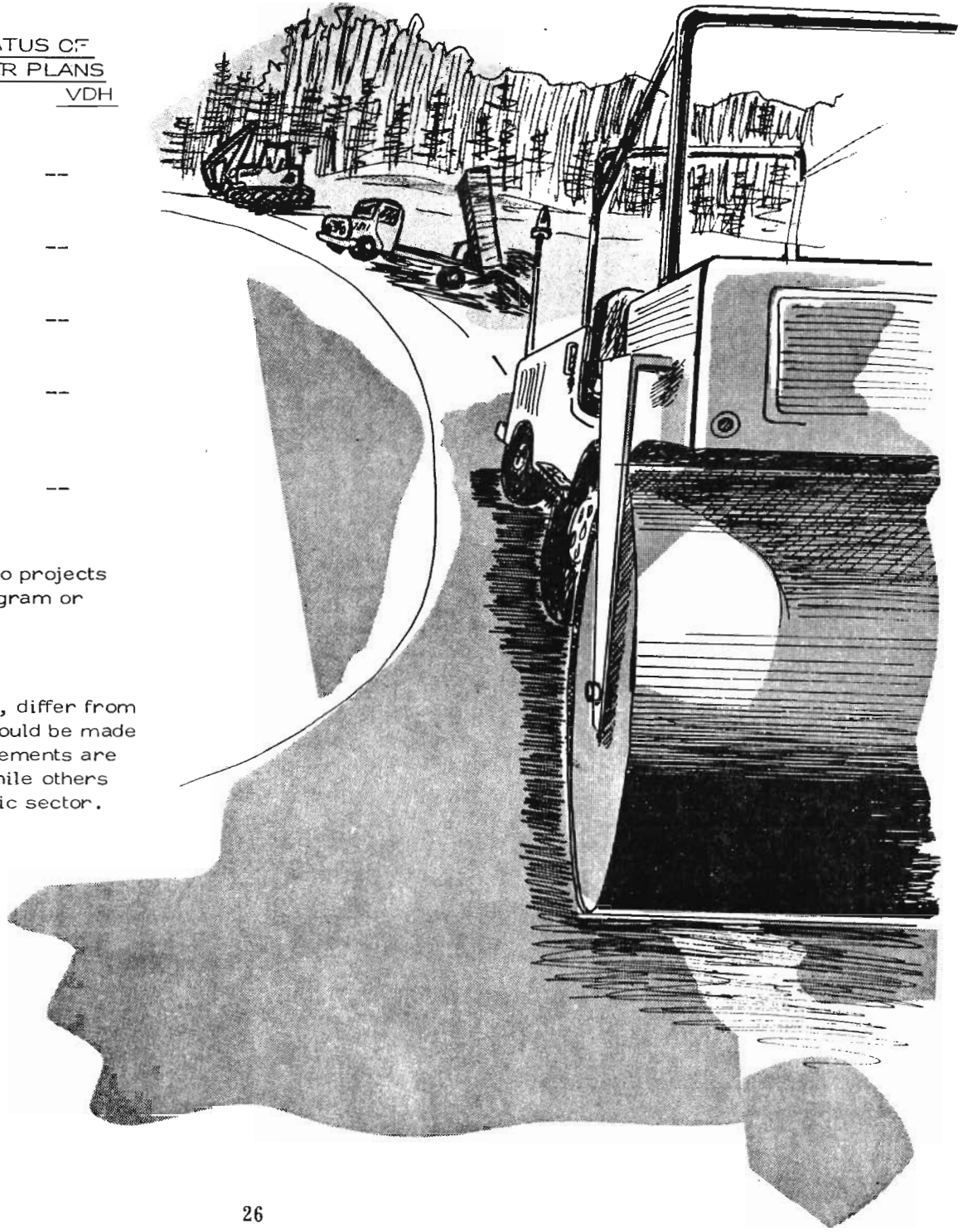
PROJECT DESCRIPTION	STATUS OF OTHER PLANS COG	VDH
Existing Needs		
1. Dale City Interchange - Stage 1	--	South-bound Off-Ramp Improvement '74 - '75
2. Dale Blvd. Rt. 642 to Forestdale	Within 10 years	2 additional lanes '75-'76
3. Route 28 Manassas Park to Fairfax County Line	--	10 Year Plan
4. Route 1 Possum Point Road to Fairfax	--	--
5. Davis Ford Road Occoquan Forest to Route 640	--	Upgrade 2 good lanes '74 - '75
6. Bridges - Route 1 and Route 123	--	Projects underway
7. Route 641 between Lake Ridge and Route 123	--	2 additional lanes '77 - '78
8. Route 234 - Manassas to Route 642	--	--
9. I-66 Extension, Gainesville to Fauquier County line	Within 10 years	10 Year Plan
10. Graham Park Road Route 1 to Graham Park School	--	--
11. Route 234 - Route 642 to I-95	--	--
12. Access from Marumsco Creek Park to Route 1	--	--
Five Year Needs		
1. Dale City Interchange - Stage II	--	--
2. Route 28 By-Pass	Within 10 years	10 Year Plan
3. Route 234 By-Pass and I-66 Interchange	Within 10 years	--
4. Route 640 - Forestdale to Lake Ridge	--	--
5. Route 642 - I-95 to Route 1	--	--
6. Route 642 - Route 640 to I-95	--	--
7. Balls Ford Road, Route 674 to point E of 234	--	--
8. Ashton Avenue	--	--
9. Williamson Avenue	--	--

PROJECTED DESCRIPTION	STATUS OF OTHER PLANS COG	VDH
10. Portsmouth Extended E - W Connector	--	--
11. Sudley Manor Drive Extended	--	--
12. Ridgefield Road	Within 10 years	--
13. Lancaster Blvd. Long-view Route 1 to Horner Road - I-95	--	--
14. Bethel Area 639/642	--	--
15. Horner Road - Route 640 to I-95	--	--
16. I-95 at Route 639 (Bus Ramps)		--
17. Liberia Avenue, South to Route 234 Extended	--	--
18. Manassas Drive Extended to Davis Ford Road	--	--
19. Euclid Avenue Extended to Fairfax County Line	--	--
Long Range Needs and Alternatives		
1. Monticello Freeway	After 10 years	--
2. Dale City Interchange I-95	--	--
3. Horner Road I-95 Interchange	--	--
4. Route 234 I-95 Interchange	--	--
5. Route 15	--	--
6. Route 29/211	--	--
7. Route 234 - I-66 to 29/211	--	--
8. Route 28 - West of Manassas to Fauquier County Line	--	--
9. Route 1 - Possum Point Road to Route 619	--	--
10. Route 610 - Route 640 to Route 1	--	--
11. Tanyard Hill Road - Route 641 to Route 123	--	--
12. Old Bridge Road - Lake Ridge to Route 642	--	--
13. New Arterial - Route 234 to Dale Blvd.	--	--
14. Opitz Blvd.	--	--
15. Fuller Road - Route 619	--	--
16. Route 642 - Davis Ford Road to Route 234	--	--
17. Route 640 - Dale City to Route 234	--	--
18. Route 643 - Route 234 to Route 642	--	--

PROJECT	DESCRIPTION	STATUS OF OTHER PLANS COG	VDH
19.	Freestone Point East of Route 1	--	--
20.	Davis Ford Road from Manassas to Route 640	--	--
21.	Route 123 - I-95 Interchange	--	--
22.	Route 234 Extended from Route 1 to Possum Point Road	--	--
23.	Cherry Hill Road Improvement	--	--

VDH - Remarks in this category refer only to projects which appear in either 6 year secondary program or 10 year primary plan.

These priorities may, in some cases, differ from the plans of other agencies. Every effort should be made to bring these plans together. Some improvements are designed to be built by the private sector, while others will be partially or totally funded by the public sector.



3 The Outer Beltway

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BACKGROUND

As any resident of the Washington Metro area can attest, the Capital Beltway has had a tremendous impact on the land uses of the area. Recently, the Washington Center for Metropolitan Studies released a study of Washington and its suburbs. The report stated that the Capital Beltway may well be the most important alteration to the physical structure of Metro Washington during the present century -- a force which will influence patterns of growth for at least the remainder of the century and perhaps longer. The Beltway, the Center says, has become the area's"main street" -- the new focus for commercial and residential development and the major transportation link. In short, when planning a road such as a Beltway, a great deal of study must be undertaken.

The COG/TPB Info Report No. 13, printed in November, 1968 and entitled Impact of the Capital Beltway, Some Notes and Observations, highlights two earlier reports prepared in 1968 regarding socio-economic studies on the Beltway. This report concludes that there are three major lessons that can be learned from the Capital Beltway. They are:

1. The need for early planning, which would include adequate forecasting and reliable impact studies. The impact of the facility should be forecasted before its construction so that its future function can be seen and agreed upon .

2. Both studies portray the need for better land use controls around interchanges and both offer proposals of how increased control may be more effective. The reasons for increasing the control of land use around interchanges are:

   a. to protect the proper functioning of the transportation facilities and the investment in the facilities;

   b. to increase the level of safety. Although the safety record of freeways such as the Beltway is very good, the high accident rate on arterials at the interchanges with freeways is of great concern;

   c. to provide an efficient use of this highly accessible land;

   d. to strive for a more pleasant environment for the people whose lives will be affected by the condition of an interchange area.

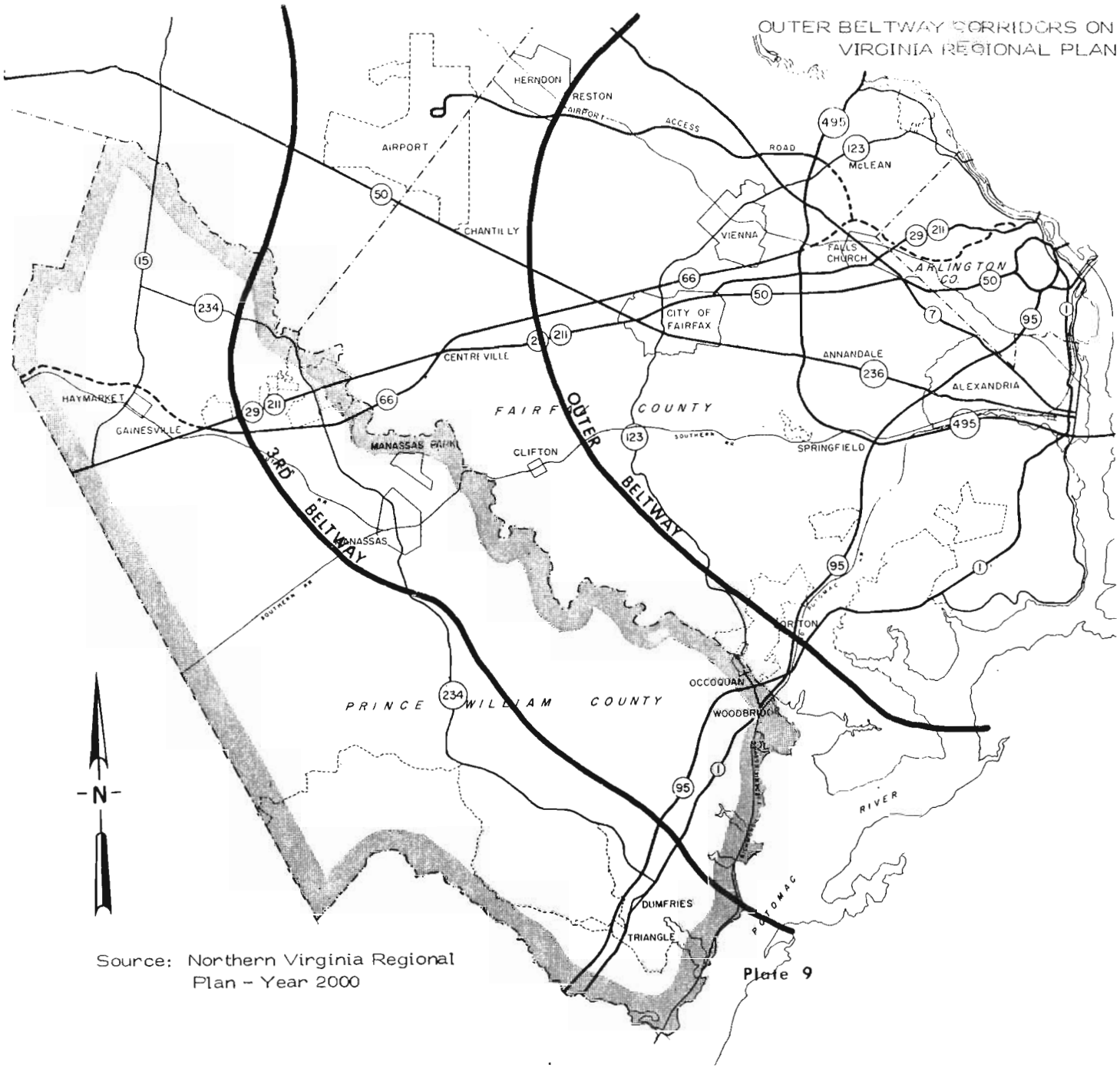
3. The third item to be learned is the most positive one and that is how to build highways in urban and suburban areas with the least disruption to people and property. This is where the planning, engineering and construction of the Capital Beltway have been very successful in both states. One would wish that more had been said in both studies of how this successful situation was attained.

In short, the need for careful planning for a facility like the Outer Beltway cannot be overly stressed. The goals and function of the roadway must be agreed upon by all parties concerned.

Originally, the Capital Beltway was planned to be substantially an inter-regional facility -- a by-pass for Washington. Experience has demostrated however, that the provision of numerous interchanges allowed a different primary function, that of an intra-regional highway.

The Outer Beltway is now conceived to have the original function of the First Beltway. To protect the inter-regional function, the number of permitted interchanges will have to be severely restricted. Whether such a policy could be maintained in the face of demand for access is an open question.

If the Outer Beltway were to come into Prince William County, the impact on the land uses surrounding this facility must be carefully analyzed in advance. A careful planning process must be initiated to determine the alignment. This planning process must involve COG, as



Source: Northern Virginia Regional Plan - Year 2000

Plate 9

well as individual coordination between Prince William County, Fairfax, Loudoun and other affected governments. With all interested parties in this matter working in a coordinated, unified effort, adequate planning will ensure the success of the Outer Beltway.

PROPOSED CORRIDORS FOR THE OUTER BELTWAY IN PRINCE WILLIAM COUNTY

Plans for a second or "Outer Beltway" around the Washington Metropolitan area have long been advocated. One of the earliest studies identifying such a Beltway was the National Capital Planning Commission's 1961 study entitled "A Policies Plan for the Year 2000: The Nation's Capital". In 1965, the Northern Virginia Regional Planning Commission published its "Northern Virginia Regional Plan: Year 2000", which also shows this proposal. Plate 9 shows the alignment of the Outer Beltway on the Northern Virginia Regional Plan.

Interestingly enough, this plan also proposed a Third Beltway which would transverse Prince William County. Although the Third Beltway was shown on the proposed County Comprehensive Plan prepared in 1964, the original Manassas Planning Area Plan and the Dale City Plan, a more recent amendment to the Manassas Plan eliminated the Third Beltway. Since the adoption of the Dale City Plan in 1969, the concept of a Third Beltway has not appeared on recent Regional Plans, nor has it appeared on the Virginia Department of Highway's Metropolitan Planning Division March 1972 proposed highway improvements map for Prince William County. There is no planning at any level now being undertaken to include a Third Beltway around the Washington Metropolitan area. However, considerable effort is being made to plan a Second Beltway. For the purposes of discussing possible corridors, the alternative of having no Second Beltway at all will not be addressed.

Alternative #1

A similar alignment to the Northern Virginia Regional Plan route for the outer or Second Beltway was shown in the Recommended Major Thoroughfare Plan - 1985 - Northern Virginia Study Area. This plan, completed in 1968 by Hayes, Seay, Mattern and Mattern, was done for the Virginia Department of Highways. Plate 10 shows the alignment of the Outer Beltway in this plan. This plan advocated a bridge crossing at Mason's Neck to Maryland. This general alignment through Fairfax County shall hereafter be referred to as Alternative #1 for discussion purposes. The crossing at Mason's Neck appears to be no longer thought necessary. In this event, the Outer Beltway would end at I-95 or Route 1, and would not make a complete circuit into Maryland.

Alternative #2

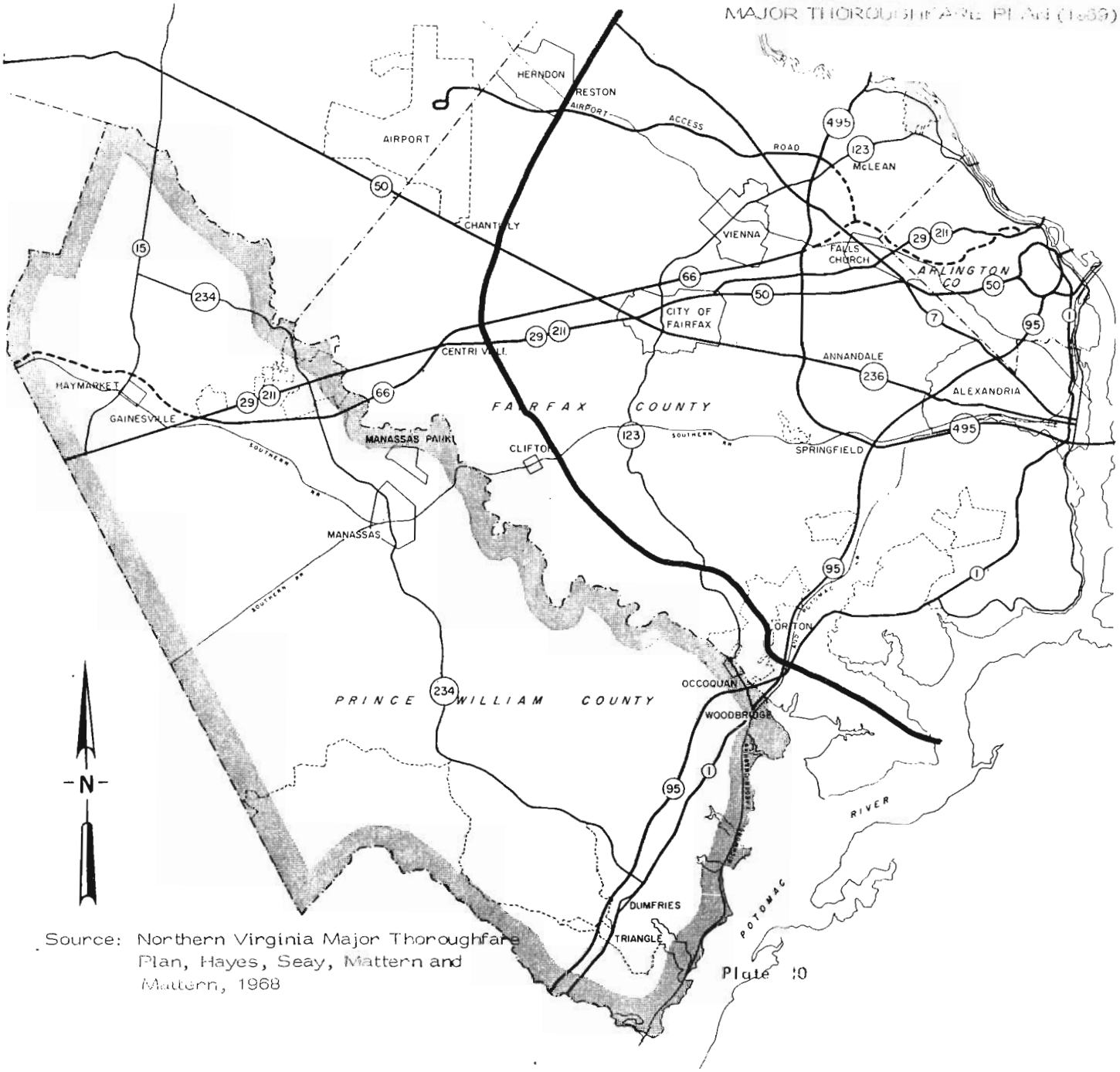
In June, 1973, the National Capital Region Transportation Planning Board adopted a plan by the Washington Metropolitan Council of Governments Transportation Staff entitled Recommended Major Highway Elements, 1973 Transportation Plan.

This plan, shown on Plate 11, advocates having the Outer Beltway transverse the south eastern section of Prince William to a new interchange of I-95, without crossing the Potomac. The proposed alignment in Prince William is that of Ridgefield Road with the Outer Beltway swinging to the northwest in Fairfax and Ridgefield continuing to the northeast to the proposed Northern Virginia Expressway. This alignment hereafter referred to as Alternative #2 presents serious problems.

First, if the Outer Beltway were to use the Ridgefield Road corridor, the Outer Beltway would not serve the function of Ridgefield Road which it would in large part replace. Ridgefield Road is intended to be a major arterial collector and distributor which will have a number of access points to the developed areas which it will traverse. An Outer Beltway on the other hand will have severely limited access, with interchanges probably at only I-95 and possibly at one other road in Prince William County.

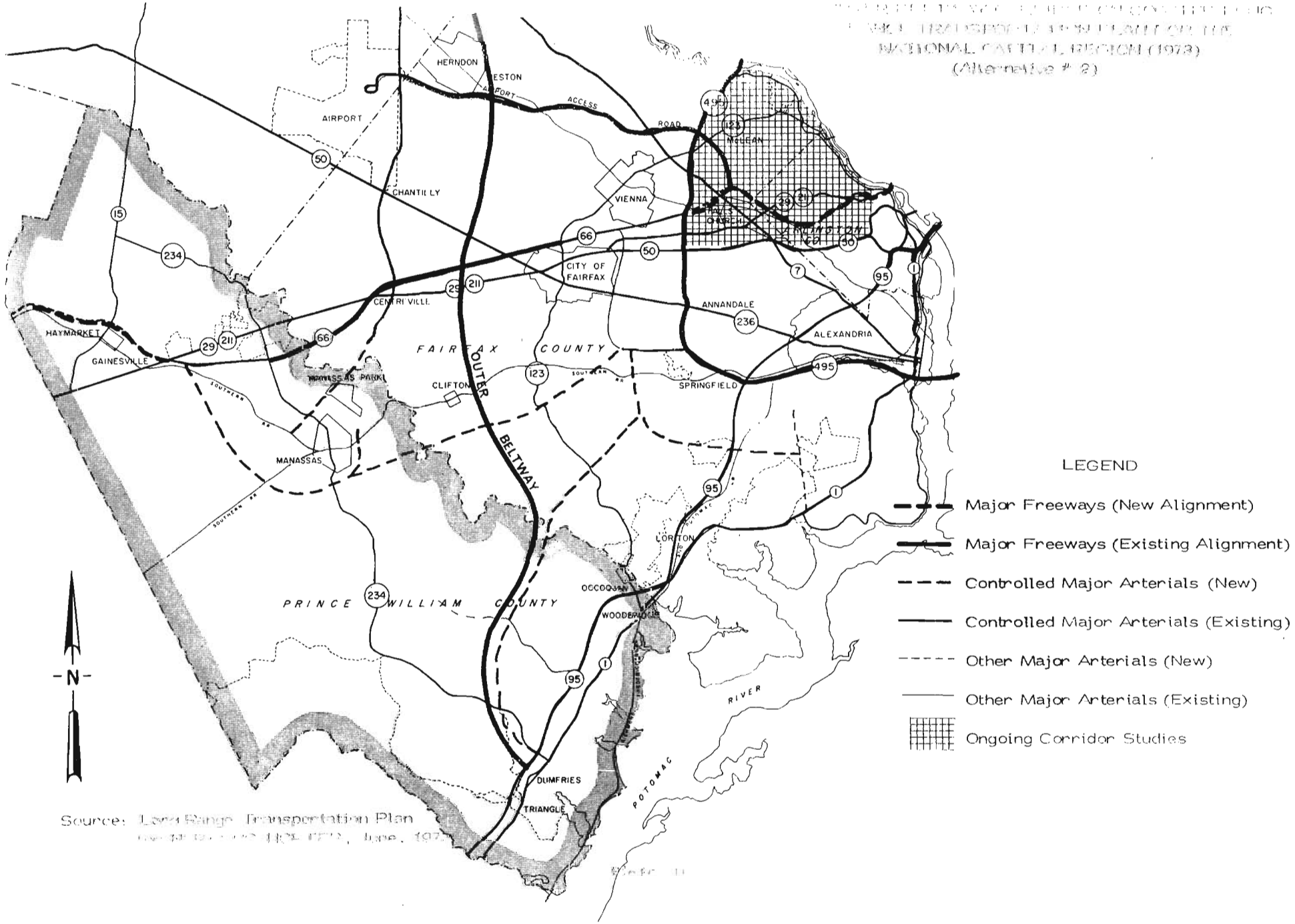
Secondly, if the Ridgefield Road Corridor were used, there would be severe right-of-way acquisition

OUTER BELTWAY CORRIDOR IN NORTHERN VIRGINIA
MAJOR THOROUGHFARE PLAN (1968) (Alternative #1)



Source: Northern Virginia Major Thoroughfare Plan, Hayes, Seay, Mattern and Mattern, 1968

Plate 10



NATIONAL CAPITAL REGION (1973)
(Alternative # 2)

Source: Long Range Transportation Plan
[illegible], June, 197[illegible]

problems in that Ridgefield Road is currently being planned for a maximum right-of-way of 180 feet. The Beltway would need 300 - 400 feet for right-of-way.

Third, the 1973 COG Plan advocates having the Outer Beltway use some of the Route 234 Corridor. Securing the necessary right-of-way along Route 234 through the Prince William Forest Park would be difficult. Furthermore, the integrity of Route 234 as a primary route between the eastern and western sections of Prince William County would be jeopardized. This route for the Outer Beltway would not be at all compatible with the long range plans for arterial roads proposed above.

Alternative #3

There are two other corridors in eastern Prince William that appear feasible for the Outer Beltway — one along Route 639 and the other defined by Route 610.

Prince William County adopted in 1971 an area plan as part of its Comprehensive Plan entitled Corridor Study - Routes 640, 641, 642, which encompasses the eastern portion of the alignment shown as Alternative #3 (Plate 12).

The development plan of the Corridor Study shows Route 639 improved to a four-lane divided arterial with an interchange on I-95. The plan shows an "Intensive Development Center" west of I-95 adjacent to the interchange as well as high intensity residential uses in the area. The plan requires that Route 639 provide local access to I-95.

If the Outer Beltway were to follow the 639 Corridor then the restricted access on I-95 and the Outer Beltway would negate the concepts of the plan. The Beltway could conceivably be located slightly north of Route 639. If Alternative #3 were to be implemented, the only interchanges permitted would probably be at I-95 and Ridgefield Road. An arterial extension of the Outer Beltway could possibly be made to Route 1, thereby permitting some local access to the Outer Beltway from the Woodbridge area. Extensive detailed planning would be necessary. Adjustments to the arterial plans would also be necessary. Elimination of access to I-95 at Route 639 will put more emphasis on the need for an interchange at Route 610 and I-95.

This alignment would require that all governments involved commit themselves very soon to this route so that the right of way could be protected from development anticipated in the next few years. The Outer Beltway's crossing of the Occoquan would necessarily cut through a critical environmental area as identified in Part 1 of the County-Wide Comprehensive Plan.

Alternative #4 - Route 610 Corridor

In this alignment, the Outer Beltway would begin at I-95 near Route 610, proceed northwest to a point south of Dale City, then along 643 west of Dale City turning north at Route 642. The possibility also exists for extending the Outer Beltway as an arterial from I-95 to Route 1.

This alignment would be wasteful in that a much greater distance would be traversed than would any of the other alternatives. Nor would this route serve the Lake Ridge or Woodbridge areas as well as the other routes. However, the route offers the advantage of taking traffic off of I-95 farther to the south. The Occoquan crossing would also traverse a critical environmental area. The number of interchanges would again be restricted. If an interchange were to be permitted on Route 663, it would force dense development in an area that is environmentally sensitive and which is shown as an open space "wedge" in the Year 2000 Plan for Metropolitan Washington.

As in the case of #3 the right-of-way for this alignment would have to be protected within the very near future (see Plate 12).

RECOMMENDATION - OUTER BELTWAY CORRIDOR

Of the four alignments discussed, the first in Fairfax County appears to best serve Prince William's needs. This recommendation assumes the completion of Ridgefield Road from Prince William to at least the Outer Beltway and the Northern Virginia Expressway. In the event that this alignment is not feasible, the preferred second choice would appear to be #3 in the Route 639 Corridor. The other two alignments - #2 and #4 are not recommended.

OUTER BELTWAY CORRIDOR:
ALTERNATIVES 3 AND 4

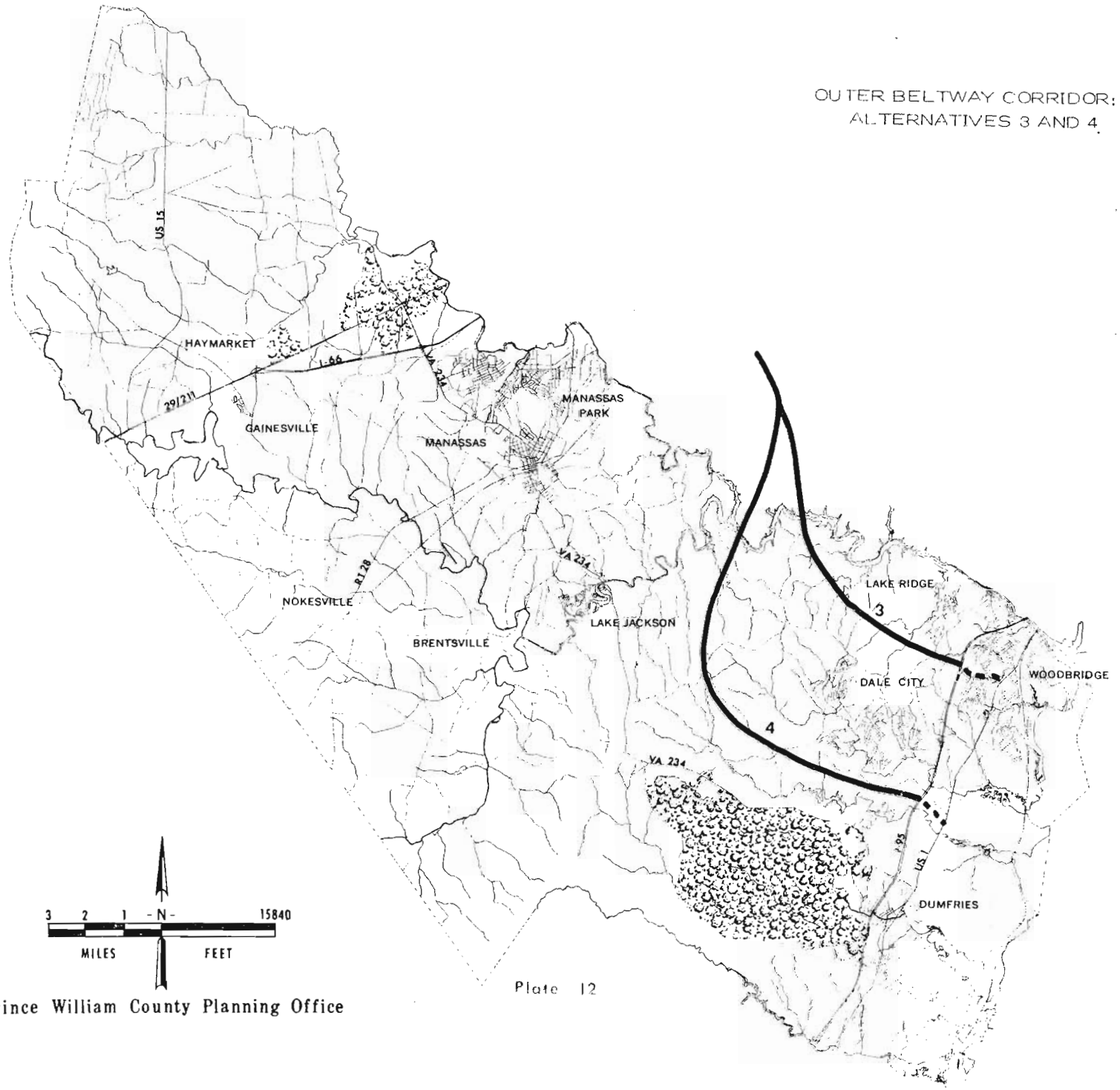
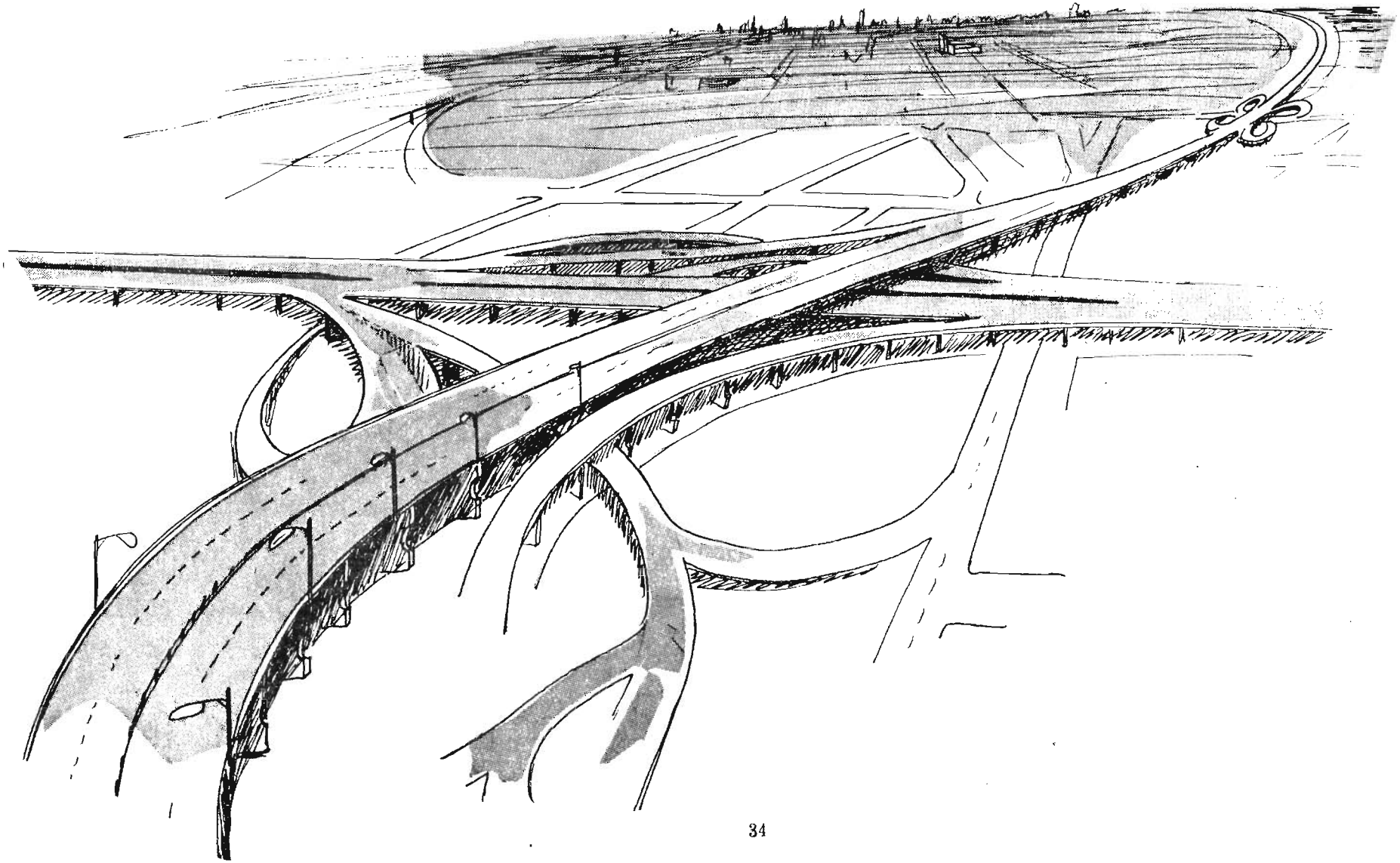


Plate 12

Prince William County Planning Office

A decision is needed on the Outer Beltway at an early date. Prince William County should seek to cooperate with neighboring jurisdictions, the Virginia Department of Highways and the Metropolitan Washington Council of Governments in order to arrive at a plan for the Outer Beltway that is acceptable to all jurisdictions.



4 Mass Transit Planning

Prince William County is not a member of the Northern Virginia Transit Commission (NVTC) nor is it in the franchise area of the Washington Metropolitan Area Transit Authority (WMATA). These agencies have no plans to extend any METRO lines to Prince William nor to locate any METRO stations in Prince William County. Despite its status as an "outer" or fringe county, there is a definite need for Prince William to be tied into the rest of the metropolitan area by mass transit facilities. According to the 1970 census, only 47% of Prince William County's residents listed the County as their location of employment. Fifty-two percent worked outside of the County. Of these, thirty-six percent worked in Northern Virginia, approximately ten percent in Washington, D. C. and three percent in Maryland. This 1970 census data is shown on Table 6.

It should be noted that this data was based on the 1970 census. In 1970, Prince William County had a population of 111,102. It is presently estimated that as of July, 1974, Prince William County's population will be approximately 152,000, for an absolute increase of 41,000 people. This represents a 37% increase above the 1970 census figure.

As employment opportunities have not greatly increased within Prince William County during the past four years, it can be assumed that many more Prince William County residents are now commuting to employment centers outside of Prince William County. Furthermore, Prince William County is continuing to exhibit a 7-8% growth rate per year. By 1980, Prince William's growth is projected to be approximately 206,000. In short, with many of Prince William County's residents commuting to Washington, D. C. and areas of Northern Virginia for employment, the County must work to provide mass transportation alternatives to its residents. If this is done, many benefits will accrue.

First, the County's residents will have a choice in their mode of travel. Second, mass transportation facilities will reduce travel time to work for many of the County's residents. Lastly, mass transportation alternatives will cut down on air pollution as well as conserve fuel. Only by planning for and providing increased mass transit facilities will the County be able to adequately serve the present population as well as future population growth. Only by acting now will the County's current dependency on the automobile be controlled.

Table 7 shows how Prince William County residents traveled to work in 1970. The 1970 figure indicates that a large pool of possible mass transit ridership existed at that time. Since that time, bus ridership has increased over the 1970 figure of 527 persons. However, in general, because of Prince William County's continued rapid growth, the means of transportation to work for the majority of Prince William County residents continues to be either as a private auto driver or a private auto passenger. As stated earlier, the County's goals in the field of Mass Transportation must include reducing the County's dependency on the automobile.

TABLE 7:

MEANS OF TRANSPORTATION TO WORK - PRINCE WILLIAM COUNTY RESIDENTS, 1970

Private Auto Driver	30,832	73.7%
Private Auto Passenger	5,875	14.1%
Walk	2,530	6.0%
Bus	527	1.3%
Taxicab	172	.4%
Other Means	1,030	2.5%
Worked at home	850	2.0%
	41,816	100.0%

Source: U. S. Census 1970

EXISTING MASS TRANSIT SERVICES IN PRINCE WILLIAM COUNTY

As of April, 1974, nearly 1700 eastern Prince

TABLE 6:

LOCATION OF EMPLOYMENT OF PRINCE WILLIAM RESIDENTS, 1970[A] AND 1974[B]

LOCATION OF EMPLOYMENT	1970	Percentage of Total	1974	Percentage of Total
Prince William County	18,941	47.5	24,736	48.3
Fairfax County	6,931	18.1	9,446	18.5
Arlington County	3,145	8.2	4,233	8.3
Washington, D. C. (other than CBD)	3,062	8.0	5,183[C]	10.0
City of Alexandria	1,999	5.2	2,590	5.0
Montgomery & Prince Georges Counties	1,075	2.8	1,315	2.5
Washington, D. C. CBD	825	2.2	C	C
City of Fairfax	775	2.0	943	1.8
City of Falls Church	403	1.1	467	.9
Loudoun County	379	1.0	440	.9
Outside Metropolitan Area	1,483	3.9	1,903	3.8
TOTAL	39,018	100.0%	51,256	100.0%

A. Source: U. S. Census, 1970. Resident workers not reporting a place of work totaled 3,568 persons.
B. 1974 Projections are straight line projections for census material.
C. This is combined Washington D. C. (Includes CBD and other than CBD)

William residents and 70 from the Manassas area used mass transit facilities to commute to work.

In western Prince William County, Continental Trailways provides busses for commutation purposes to Washington from the Manassas area. In eastern Prince William County, Greyhound carries approximately 150 commuters daily to Washington. The schedules of Greyhound (Eastern Prince William) and Trailways (Western Prince William) are shown on Table 8.

TABLE 8:

I. FROM THE ROUTE 1 CORRIDOR (eastern Prince William) TO WASHINGTON, D.C. BETWEEN 6:00 A.M. and 8:00 A.M.

Leaves Woodbridge Area	Leaves Washington D. C.
6:08 a.m.	3:30 p.m.
6:25 a.m.	4:10 p.m.
6:30 a.m.	4:35 p.m.
6:45 a.m.	4:55 p.m.
7:00 a.m.	5:00 p.m.
7:15 a.m.	5:15 p.m.
7:30 a.m.	5:30 p.m.
	6:30 p.m.

Approximate travel time - 40 minutes each way

II. FROM THE I-66 CORRIDOR (western Prince William)

Leaves Manassas	Arrives Washington D. C.
6:35 a.m.	8:15 a.m.
7:00 a.m.	8:00 a.m.
7:45 a.m.	9:15 a.m.

Leaves Washington D. C.	Arrives Manassas
4:15 p.m.	5:45 p.m.
5:00 p.m.	6:20 p.m.
5:15 p.m.	6:25 p.m.
5:30 p.m.	6:35 p.m.

A number of other bus lines provide commuter service to eastern Prince William County residents. Largest among these bus companies is Rappahannock Valley Lines and Colonial Transit. Rappahannock has provided commuter service from Fredericksburg to the Pentagon. In October, 1969, thirteen residents of Dale City who were riding this commuter route petitioned Rappahannock to establish a commuter run directly from Dale City to the Pentagon. To meet this need, a new bus company - Colonial Transit - was formed.

Currently, these two lines are carrying over 1500 commuters daily to Northern Virginia and Washington, D. C. Dale City has 1000 riders, Lake Ridge has 200, and 300 riders board these busses in the Route 1 corridor. In March of 1974, Jet-Star Community Transportation Service Bus Line commenced service in Eastern Prince William. This bus line is providing commuter service from eastern Prince William to Lorton and Fort Belvoir as well as providing local service throughout eastern Prince William County at two hour intervals throughout the day. Areas in eastern Prince William served by Jet-Star include Quantico, Triangle, Dumfries, Georgetown Village, Woodbridge, Occoquan, Dale City, Lake Ridge, Rolling Brook, Potomac Hospital, Marumsco Shopping Center and Marumsco Village and Hills.

TRANSIT PLANNING AT COUNTY LEVEL

The Prince William Board of County Supervisors is vitally interested in upgrading existing mass transit services and facilities for the citizens of Prince William. In the fall of 1973, the Board of Supervisors established the Prince William County Mass Transportation Committee. The Committee has been mandated to make recommendations to the Board on all matters relating to mass transportation. Since its inception, this Committee has been most active. The Committee is divided into four sub-committees. These include the Commuter Rail Sub-Committee, the Transit Improvement Study Sub-Committee, the Immediate Problems/Solutions Sub-Committee, and the Transit District Establishment Sub-Committee.

1. Commuter Rail - Early in 1974, the Board of Supervisors took a special interest in exploring the possibility of establishing commuter rail service in Prince William County. By Board directive, a committee which includes two County Supervisors was established to pursue this matter. This committee has done a great deal of work in ascertaining the feasibility of commuter rail service in both eastern and western Prince William County. The first major breakthrough for this Committee occurred when both the Southern Railway and the Richmond, Fredericksburg and Potomac Railroad Company submitted proposals to Prince William County which enabled the County to utilize each company's tracks for limited commuter rail. Prior to this time, neither railroad had provided commuter rail service nor encouraged others to utilize their tracks for this purpose. This committee has met with a number of federal and state officials to secure financial backing for this project. Their work has involved commissioning an extensive survey to determine the citizens interest and support for commuter rail. Three thousand, four hundred and fifty-three households responded to the mailed questionnaire. Most households indicated more than one rider. The survey indicated 1,197 persons were interested in using the commuter rail service on a daily basis, 1,788 frequently, and 3,697 infrequently. Detailed breakdowns of the survey results are shown on Table 9.

In March, 1974, the members of this Board-appointed Committee were appointed to the Mass Transportation Committee. With the efforts of all involved, the County is continuing to pursue commuter rail service. It is expected that formal grant applications will be readied soon for this project.

2. Transit Improvement Study - One of the first actions taken by the Mass Transportation Committee was to explore the possibility of securing federal and state monies to undertake a study of the County's overall mass transit needs. As has been pointed out earlier, prior to appointing the Mass Transportation Committee, the County had done little in determining its long range transit needs. During the winter of 1973, the Mass Transportation Committee interviewed State, Federal and Regional transportation planners to learn how the County could ascertain planning grants. The Mass Transportation Committee

TABLE 9:

COMMUTER RAIL QUESTIONNAIRE RESULTS

	Daily	Frequently	Infrequently
Woodbridge to L'Enfant	239	318	616
Woodbridge to Crystal City	101	78	140
Woodbridge to Alexandria	67	124	188
Manassas to L'Enfant	129	333	823
Manassas to Crystal City	33	76	86
Manassas to Alexandria	34	78	110
Clifton to L'Enfant	28	57	75
Clifton to Crystal City	13	17	17
Clifton to Alexandria	0	5	23
Quantico to L'Enfant	21	70	122
Quantico to Crystal City	7	11	25
Quantico to Alexandria	14	21	43
Manassas Park to L'Enfant	32	32	89
Manassas Park to Crystal City	11	9	27
Manassas Park to Alexandria	5	19	25
Burke to L'Enfant	113	90	213
Burke to Crystal City	55	54	65
Burke to Alexandria	3	40	58
Springfield to L'Enfant	212	236	706
Springfield to Crystal City	66	69	151
Springfield to Alexandria	12	51	93
TOTAL RIDERS	1,195	1,788	3,697

Number of Never Rides - 621

learned that UMTA (Urban Mass Transportation Administration) technical study grant money (80% federal, 20% local) was available if Prince William County applied through the Washington Metropolitan Council of Governments Unified Work Program. This step was needed because COG has been designated as the overall grant recipient (UMTA Technical Studies money) for the Washington Metropolitan area. The Committee drew up a work program entitled Transit Improvement Study for Prince William County. The Committee has requested the Virginia Department of Highways to help fund the local share of this study.

The Transit Improvement Study will be a multi-modal study in that it will examine all types of mass transit options available to the County. It will briefly examine short term and long term methods of improving and expanding these services. The Study is broken down into two phases. Phase I looks at improvements to the existing transit systems. Tasks include data collection and data evaluation. Phase II would be defining the short range program. Here, short range is defined as transit improvements needed over the next five year period. Based on the projected growth rate and the projected travel demands, the Study will recommend a Short Range Mass Transit Development Program which can be implemented over the next five or ten year period. This Program is envisioned to be updated annually. The Study is projected to be nine months long and will not begin before July, 1974.

3. Immediate Problems/Solutions - A number of areas have been identified by the Immediate Problems/Solutions Sub-Committee as needing immediate action to help improve and facilitate mass transit activities. This sub-committee is working on providing a combined schedule of all the bus routes presently serving Prince William County. As a number of bus companies provide service, there has never been a joint schedule available. The Virginia Department of Highways is actively seeking to build commuter parking lots in eastern Prince William County. This activity has been going on for over one year. The Immediate Problems/Solution Sub-Committee is helping to coordinate this activity with the VDH and the County Planning Office. Hopefully through this joint effort, the work can be expedited in a timely fashion. This sub-committee is also working with the VDH on coordinating efforts to build exclusive bus ramps on and off Interstate 95 at Route 639 (Horner Road). Besides these activities, this sub-committee is looking at other immediate actions which may be taken to improve mass transit facilities and operations in Prince William County.

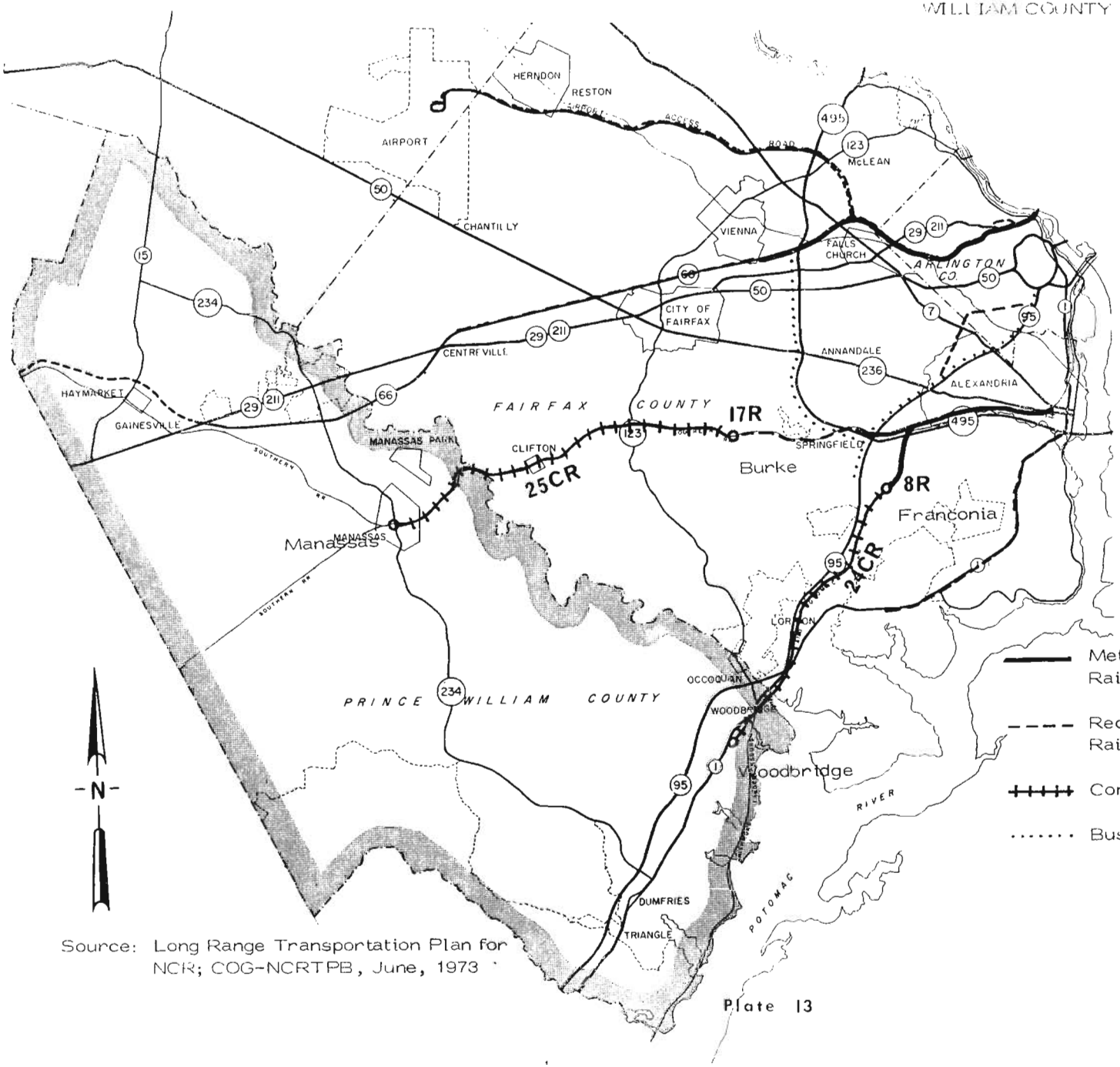
4. Transit District Establishment Study - As mentioned at the beginning of this Mass Transit section, Prince William County is not presently a member of any transit district. The Mass Transportation Committee, through the Transit District Establishment Sub-Committee is presently studying the alternatives available to Prince William concerning Transit Districts. Specifically, this sub-committee will look into the advantage and disadvantages of Transit Districts. This sub-committee is reviewing the legal implications of these districts and the necessary steps needed to either join an existing Transit District or form a new Transit District. To date, this sub-committee is still reviewing this problem and has not made any firm recommendations to the whole committee.

TRANSIT PLANNING AT THE REGIONAL LEVEL

Prince William County is a member of the Metropolitan Washington Council of Governments and is represented on the Transportation Planning Board. As a member of COG, the County participates in the Council of Governments transportation planning process for the Metropolitan area. This planning process involves all phases of transportation planning, including mass transit. COG's transit planning is divided into both long range and short range phases.

The major document outlining COG's Long Range Transit Plan is the transit element of COG's report entitled A Long Range Transportation Plan for the National Capital Region. Adopted by the Transportation Planning Board in June, 1973, the report was prepared in connection with the federal requirements for certification of the transportation planning process for the National Capital Region. This plan advocates commuter rail over the Southern Railway right-of-way from the terminus of the proposed rail transit (METRO) Station at Burke to Manassas. The plan

1973 COG/TPB CERTIFICATION PLAN: TRANSIT ELEMENTS THAT DIRECTLY AFFECT PRINCE WILLIAM COUNTY



LEGEND

- Metro Adopted 98 Mile Regional Rail Transit Program
- Recommended Added Transit Corridors Rail Transit - Extensions or Additions
- Commuter Rail Service
- Bus Priority Facilities

Source: Long Range Transportation Plan for NCR; COG-NCRTPB, June, 1973

Plate 13

also shows a second commuter rail line over the R.F.& P. right-of-way to Woodbridge. Both of these commuter rail proposals are in the early phase of COG's recommended major transit elements, which signifies that implementation is to take place during the next ten year period. Until the METRO is extended to the Franconia and Burke Stations, the COG plan advocates having both commuter rail routes terminate at Union Station in Washington, D. C. Since adoption by the COG Transportation Board in June of 1973, this Plan has not been amended (See Plate 13). COG has pointed out that the Long Range Transportation Plan for Certification point to the critical need to initiate a comprehensive program of short range transit improvements in order to help reduce long range highway demands. METRO must be supplemented by a wide range of early action transit improvements, including busways, commuter rail, circumferential transit, and innovative services, in order to significantly alter travel patterns and habits and influence longer range land development and transportation plans and programs.

Besides COG's long range transit planning activities, COG is currently coordinating the "Short-Range Transit Development Program for the Washington Metropolitan Area". The purpose of this program is to integrate and consolidate all proposed and anticipated transit service, operations and capital improvements for the 5-year period, FY 74 - FY 78.

Other purposes of the program are:

1. To integrate and consolidate all proposed and anticipated short-range transit service, operations and capital improvements in the Washington Metropolitan Area into a unified transit development program, consistent with comprehensive and transportation planning.

2. To provide a basis for maintaining the Washington Metropolitan Area's eligibility for Federal capital grants for transit improvements.

3. To provide a frame of reference for reviewing and coordinating recommended improvements by State, local, regional, and Federal agencies.

The Short-Range Transit Development Program for the Washington Metropolitan Area was adopted by the Transportation Planning Board in March of 1974. The Program will be updated on a continuing basis. Prince William County is mentioned in the report in the following manner. The numbers in front of each entry are assigned by COG and designate the functional areas which each item is placed in within the Short-Range Transit Development Program.

D2.b. Bus Only Ramps

Purpose: To provide improved bus service from Prince William County by means of bus only ramps.

Discussion: Bus only ramps have been proposed for the Horner Road overpass. These ramps will serve northbound a.m. buses and southbound p.m. buses traveling between eastern Prince William County and the Washington Metropolitan Region.

Costs: Costs for the Horner Road bus ramps are estimated by VDH at $400,000.

Funding: It is anticipated costs will be met by FHWA and VDH funds.

E 3. Virginia Fringe Parking Lots

Purpose: To develop fringe parking lots in Northern Virginia which will encourage the use of transit and relieve existing commuter parking on roadway shoulders.

Discussion: Northern Virginia is presently served by a modern 410 car park-and-ride lot on the future site of the Springfield Metro Station. The Virginia Department of Highways anticipates developing additional fringe lots in the Pohick area of Fairfax County and in eastern Prince William County. These lots will relieve existing commuter parking on roadway shoulders (a safety hazard) and in local neighborhoods and shopping centers.

Costs: FY 74 costs for these Northern Virginia fringe parking lots are estimated by VDH to be $300,000.

Funding: It is anticipated costs will be met by FHWA and State funds.

H3. Virginia Commuter Rail Lines

H3a. Southern Railroad to Manassas

H3b. R.F.& P. to Quantico

Purpose: To provide Prince William County and other Northern Virginia jurisdictions with commuter rail service to the region's core.

Discussion: Prince William County is proposing immediate action implementation of commuter rail service from its Manassas and Woodbridge/Quantico areas to the regional employment core. Discussions with other jurisdictions should determine other areas which might be served by future improvements and opportunities forcoordination beyond the immediate action improvements. A technical study proposed by Prince William County could complement and build upon these immediate action efforts by considering further service planning refinements, as well as bus transit improvements.

Costs: Implementation costs and operating costs have not yet been received.

Funding: It is anticipated that Prince William County will submit applications to UMTA for a Demonstration Grant, and for a Capital Improvement Grant to cover 80% of the capital costs, with Prince William County providing 20% of the capital costs.

MASS TRANSIT PLANNING BY VIRGINIA DEPARTMENT OF HIGHWAYS

The VDH currently is involved in promoting some mass transit facilities. Much of the impetus for VDH's increased interest in mass transit comes from the 1972 and 1973 amendments to Section 22.1-46.1 of the Code of Virginia. This section, entitled 'Highways Aid to Mass Transit" states:

> "Highway aid to mass transit may be accomplished by acquisition or construction of transit-related highway facilities such as exclusive bus lanes, bus turnouts, bus passenger shelters, fringe parking facilities, including necessary access roads, to promote transit use and relieve highway congestion, off-street parking facilities to permit exclusive use of curb lane by buses, and by permitting mass transit facilities to occupy highway median strips without the reimbursement required by $\frac{S}{S}$ 33.1-97, all to the end that highway traffic may be relieved through the development of more efficient mass transit."

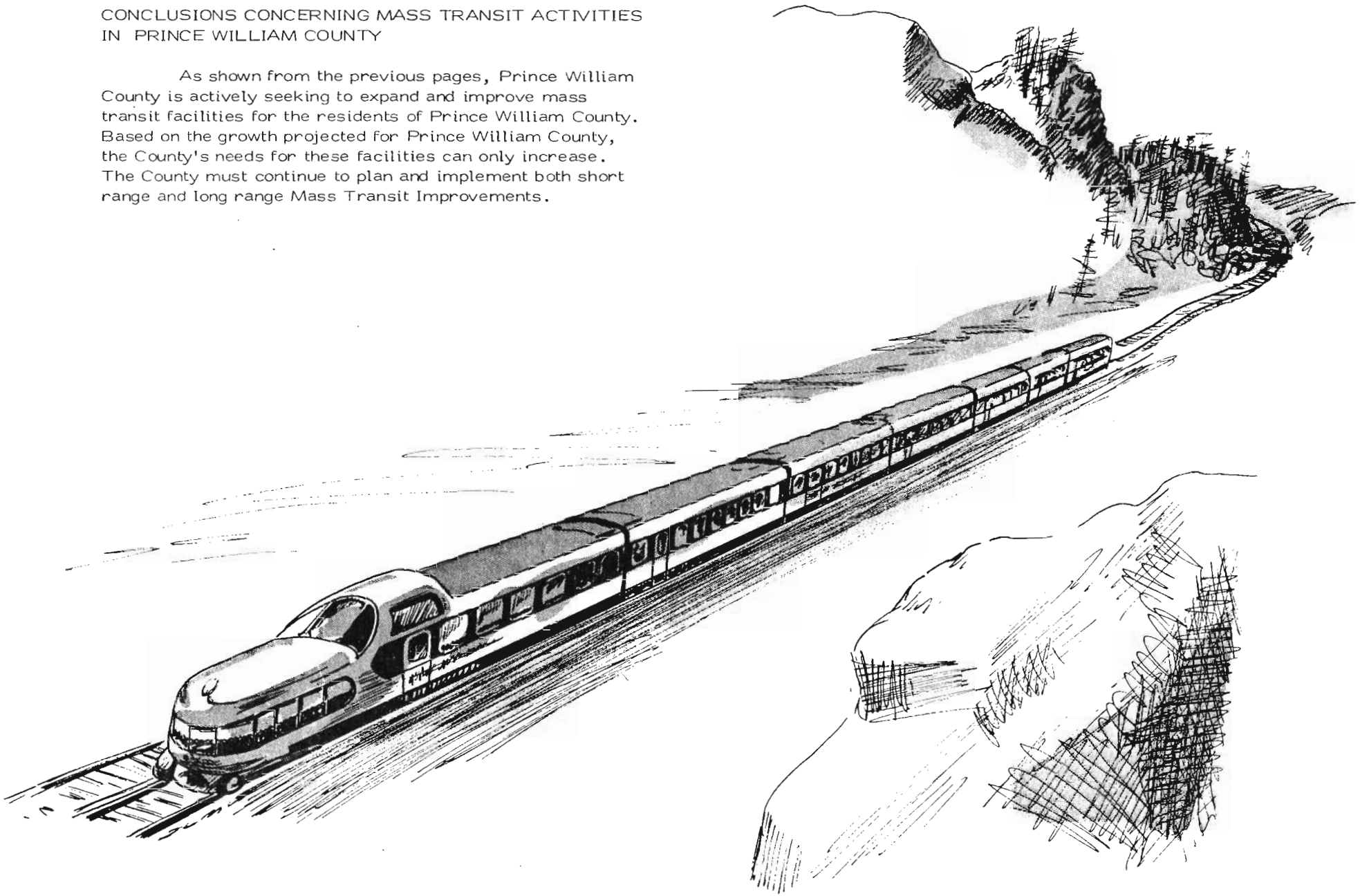
The 1974 Virginia General Assembly passed a Transportation Bill which changed the name of the Virginia Department of Highways to the Virginia Department of Highways and Transportation. Within this bill the legislature approved 23 million dollars to be spent on transit facilities in the major urban areas of Virginia. Presently Northern Virginia's share of this money is all earmarked to the Northern Virginia Transit Commission.

In the Virginia Department of Highway's ten year statewide planning program (Virginia Roads and Streets, 1972-1982) the Culpeper District (of which Prince William is a part) is projected to receive 38.5 million dollars for "Highway Aid to METRO and Bus Transit". The VDH & T Culpeper District office reports that for fiscal year 73-74, 5.36 million dollars has been allocated for aid to mass transit. This money is to be used for fringe parking facilities in the Counties of Arlington and Fairfax, and the cities of Falls Church, Fairfax and Alexandria. The VDH & T has budgeted $150,000 for transit related projects in eastern Prince William County for fiscal year 1974.

For fiscal year 1975, the State Highway Commission has tentatively approved a $300,000 supplemental allocation for fringe parking in the Dale City - Woodbridge - Lake Ridge area. Although preliminary work is currently going on to locate commuter parking sites in eastern Prince William County, the VDH & T has not made final site analysis on any of the proposed sites. The Immediate Problems/Solutions sub-committee of the Mass Transportation Committee is helping to coordinate this activity with the VDH & T. The sub-committee is also working with the VDH & T on building exclusive bus ramps on and off Interstate 95 at Route 639 (Horner Road).

CONCLUSIONS CONCERNING MASS TRANSIT ACTIVITIES IN PRINCE WILLIAM COUNTY

As shown from the previous pages, Prince William County is actively seeking to expand and improve mass transit facilities for the residents of Prince William County. Based on the growth projected for Prince William County, the County's needs for these facilities can only increase. The County must continue to plan and implement both short range and long range Mass Transit Improvements.



5 Air Transportation

Prince William County is located approximately ten miles from Dulles International Airport. This factor should be recognized in planning for future development, especially in the Manassas and Gainesville areas. In terms of regional planning, the County should seek to cooperate with Fairfax and Loudoun Counties and the Council of Governments in order to assure appropriate ground transportation links between Prince William County and Dulles Airport.

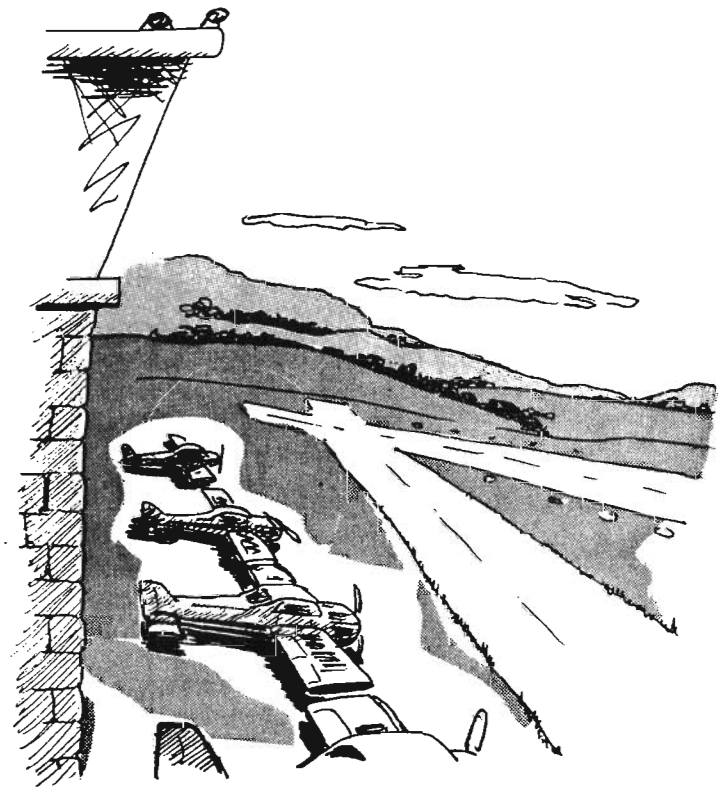
Prince William County has two general aviation airports, Manassas Municipal and the Woodbridge Airport. There is also a military airfield at Quantico Marine Corps Base, near the town of Quantico, and two recognized heliports, one at Manassas Municipal Airport and one at the Potomac Hospital in Woodbridge.

A master planning study for the Manassas Municipal Airport has recently been prepared which proposes significant expansion of this facility. The study states that there will be increased traffic using the airport in the future, and a small amount of the traffic will include business jets.

Careful coordination of land use planning with the airport is necessary. Future development around the airport should be planned and controlled by Prince William County to assure that the land uses remain compatible with present and future airport operations. Much of the surrounding land is presently zoned for industrial uses, while most of the rest remains in the agricultural category.

Community facilities such as water, sewer, major highways and rail services should also be coordinated with the airport. Perhaps the most significant highway proposal affecting the Manassas Airport is that of an arterial road that is proposed to connect Route 234 south of Manassas to Interstate 66 northwest of Manassas (highway improvement #3, second priority improvements).

All of the airports in Prince William County as well as Dulles International are going to be examined as part of a major study recently undertaken by the Council of Governments. Entitled, "National Capital Regional Air Facilities Plan and Program", this study is going to consider the air facilities of the metropolitan area as interrelated systems, which themselves are elements of a total transportation system for the metropolitan area. In addition to the concerns of aircraft, airspace, airfields and flight systems, the study will address issues in environment, ground transportation and economics. Through its participation in COG, Prince William County should monitor the progress of this study and provide input where advisable to further the County's interests.



6 Implementation Policies

The following policies are intended to serve as a guide for consistent action for the County to accomplish the objectives of the transportation plan. The policies are in many ways the most important part of the plan. The policies should be utilized by elected and appointed decision makers as well as agencies whose responsibilities influence transportation. They should provide a consistent approach to implementing the plan, as well as a guide for continued planning efforts in the future.

POLICIES FOR TRANSPORTATION PLANNING GENERALLY

1. Adopt the transportation plan as a part of the comprehensive plan for Prince William County.

2. Where conflicts exist between this plan and previously adopted planning area plans with respect to expressways and arterials, consider this plan as amendments to the existing area plans.

3. Adopt refinements and revisions to the plan when such are shown to be compatible with the plan and with County goals.

4. Seek acceptance of the transportation plan among neighboring jurisdictions, the Virginia Department of Highways, the Council of Governments and other relevant agencies.

5. Activate Outer Beltway Committee to work with Fairfax and Loudoun Counties to determine the final alignment of the Outer Beltway.

6. Seek funding from state and federal sources to implement the transportation plan:

   a. Increased secondary road allocations from the VDH, more in line with County population and land use policies.

   b. Increased primary road allocations from the VDH, more in line with the needs for improvements to the County's primary road system.

   c. Allocation of interstate funds to those projects for which need is most critical (for example, instead of building I-66 interchange with Route 15, build additional ramps at I-95 interchange near Dale City).

   d. Funding for mass transit studies and for development of mass transit facilities.

7. Promote mass transit services in Prince William County through the following:

   a. Cooperate with the Virginia Department of Highways in its program for immediate assistance to commuter transit facilities in Prince William County.

   b. Undertake a mass transit study in Prince William County, in cooperation with regional and state agencies, which will result in the development of transit facilities in the County.

   c. Seek the cooperation of the private sector in expanding transit services.

   d. Provide requirements for mass transit facilities in all Residential Planned Communities.

8. Cooperate with the Council of Governments in its work on the National Capital Region Air Facilities Plan and Program as it affects the County.

IMPLEMENTATION POLICIES FOR HIGHWAY PLANNING

1. Review annually the County's secondary road priorities and needs with the Virginia Department of Highways Resident Engineer, so that his six-year plan will reflect the County's priorities.

2. Stage the development of major roads to complement the planned development of the County.

a. Provide for early construction of major roads only where the need exists or where development is desired.

b. Provide improved access only to those areas where additional development is desired or where current needs exist.

c. Encourage development that will assist in the timely improvement of high priority roads and intersections.

d. Provide for the timing of new highway projects to coincide with the timing of other public facilities intended to implement development goals.

e. Give priority to construction of roads that will serve industrial, commercial and other employment areas.

3. Separate through traffic from local traffic wherever possible.

4. Prevent the use of minor streets by through traffic.

5. Locate major traffic generators such as high-density residential areas and commercial areas close to major arteries.

6. Locate elementary schools and neighborhood parks within residential areas so that school children and other pedestrians do not have to cross arterials to reach them.

7. Locate major industrial, commercial and employment uses close to major roads so that residential streets will not be disturbed by traffic generated by these major uses.

8. Give full consideration to environmental factors when planning the location of major roads.

9. Provide for sidewalks and pedestrian ways in order to encourage walking and to improve pedestrian safety, especially in high density areas, commercial areas, and around community facilities such as schools, parks and libraries.

10. When locating major roads in built-up areas, minimize the disruption of local business and the demolition of sound residential structures.

11. Limit at-grade rail crossings to low volume streets and rail lines, with other rail crossings eliminated either by grade separations or street closings.

IMPLEMENTATION POLICIES FOR ZONING

1. Use the zoning process to encourage development of land that will assist in the timely improvement of high priority roads and intersections.

2. Use the zoning process to discourage development of land that will only add to the traffic on already overburdened roads without assisting in the timely construction of these roads.

3. Rezone land to higher intensity uses only where the road network is adequate for the proposed uses or where road improvements are scheduled for the near future.

4. Provide to rezoning applicants all available information concerning the requirements for streets, roads, and rights of way for future roads that affect the property proposed for rezoning, so that the ensueing development of that property will be according to County plans.

5. Obtain an agreement from rezoning applicants that right of way required for roads shown on the transportation plan will be dedicated to public use, either when the property is developed or when the Highway Department needs the right of way.

IMPLEMENTATION POLICIES FOR SITE AND SUB-DIVISION DEVELOPMENT

1. Site plan requirements for right of way or street improvements shall be waived only where existing conditions are in accord with the transportation plan.

2. The number and location of access points along existing and future arterials shall be restricted by use of service roads and reverse frontage techniques wherever entrances would be unsafe or cause undue congestion.

3. Conflicts between vehicular and pedestrian traffic shall be minimized with separate walkways where needed.

4. Right of way for all streets shown on the transportation plan shall be dedicated.

5. Systematize the County's various policies and requirements on dedication of right of way, reservation of right of way, and construction of roads by developers.

6. All planned roads that cross or abut the property to be developed shall be built by the developer, provided that traffic from the proposed development will utilize the roads in question.

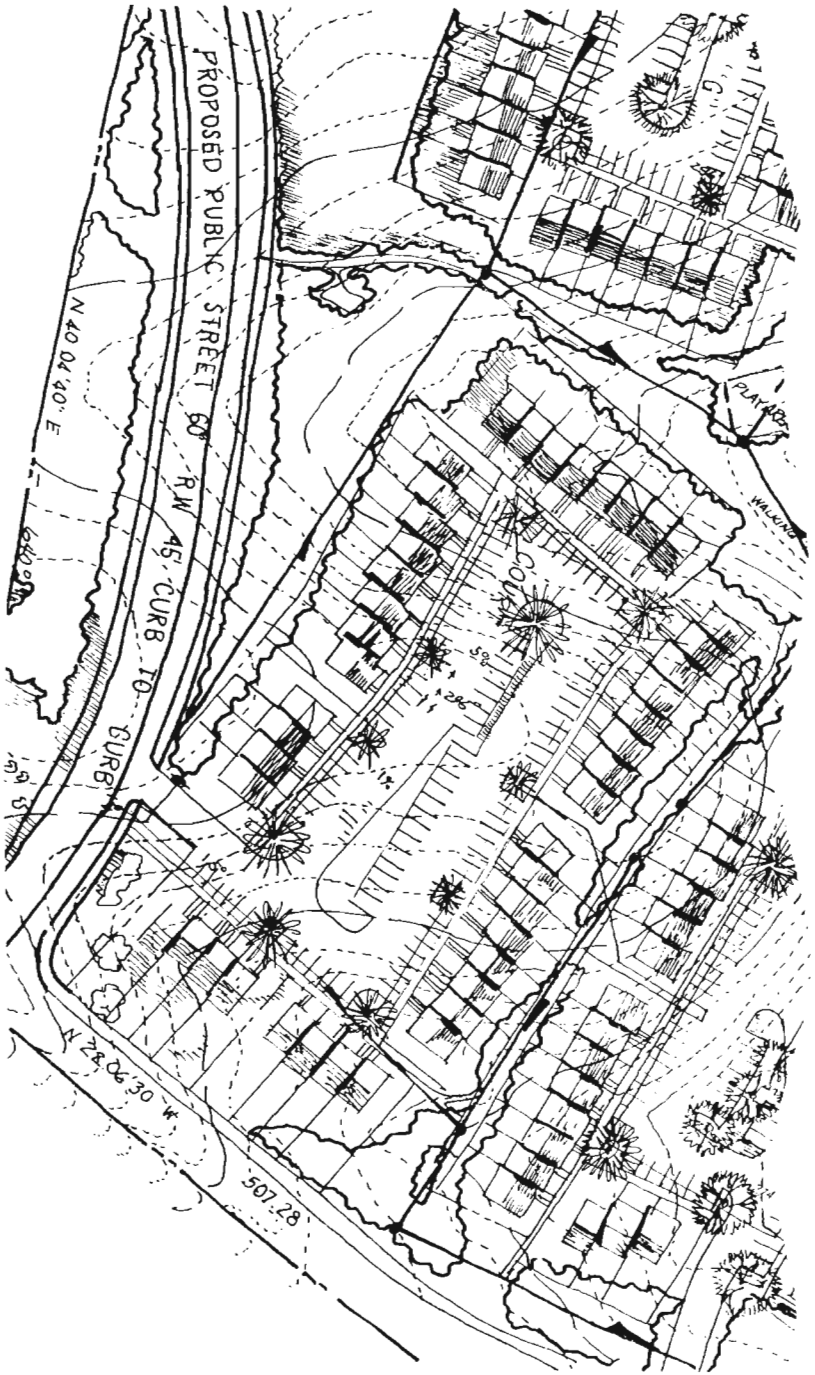
7. Streets leading into undeveloped areas shall be designed so as to insure sufficient capacity for planned future development on adjacent property.

8. Direct residential frontage on arterial roads will not be permitted.

9. Access points to large traffic generators such as employment centers, major shopping facilities and high density residential developments shall be located at safe distances to intersections and interchanges to avoid hazardous traffic conditions and congestion on major roads.

10. Revise County road standards to reflect the VDH policy letter concerning new standards for minor residential streets.

11. Landscaped open space will be preserved between structures and the paving of major roads.



GENERALIZED FIVE-YEAR PROJECTION OF URBAN LAND USES

(Based Upon Existing Zoning and Recommended Policies for Land Use Development)

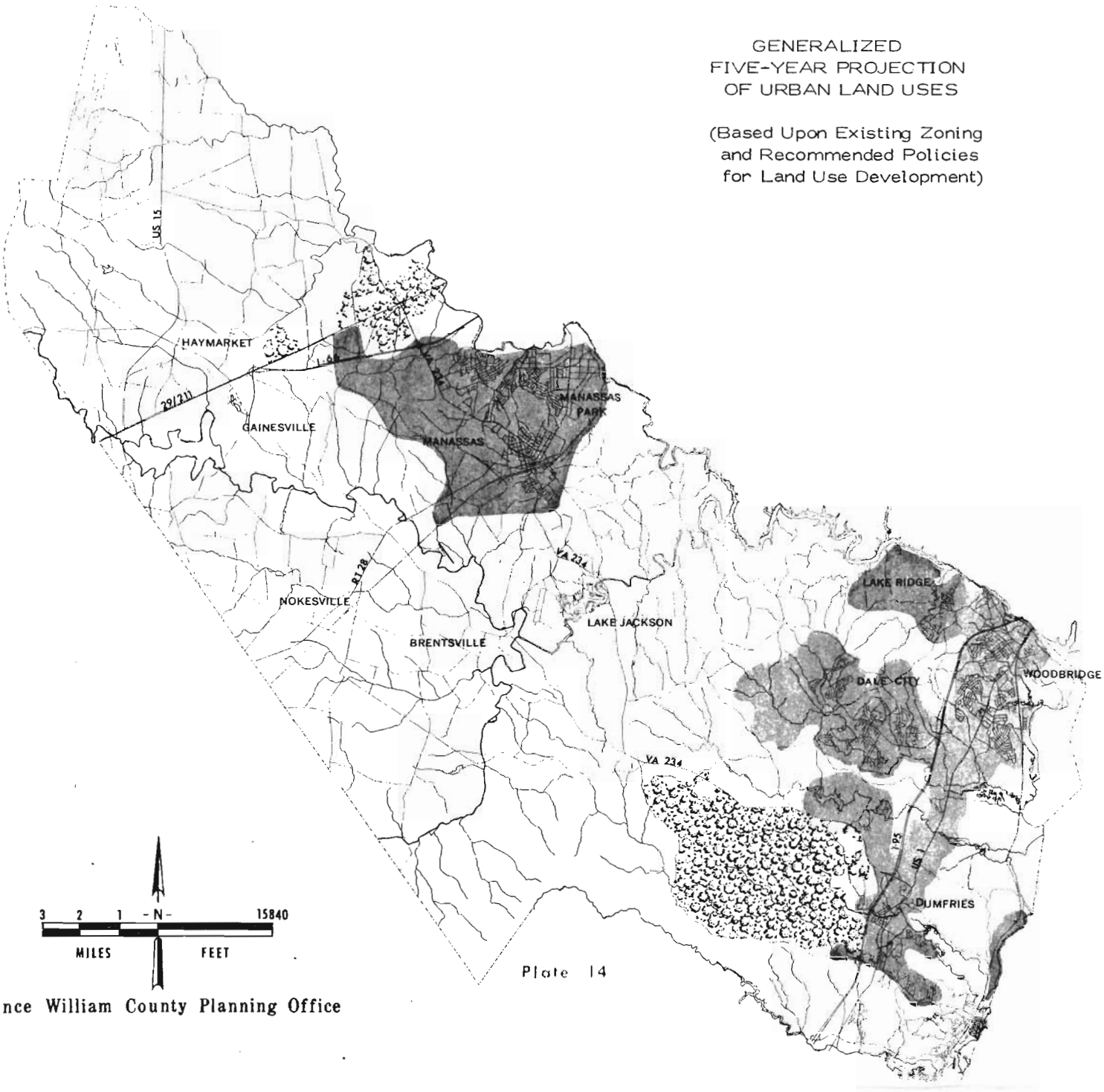


Plate 14

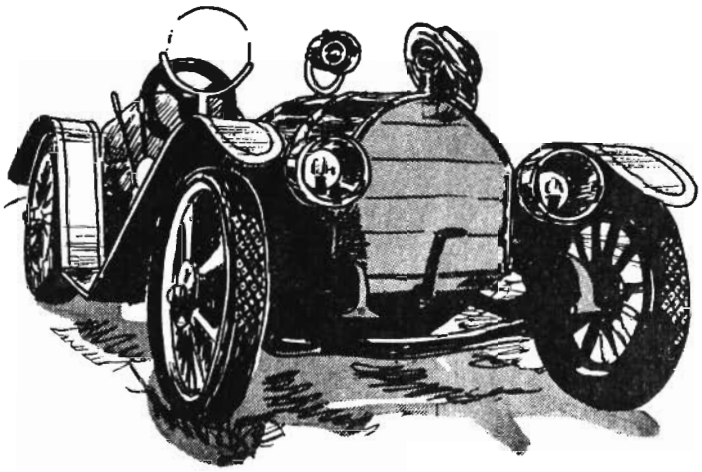
Prince William County Planning Office

Appendix

As stated in Part I of the Comprehensive Plan, the lack of an adequate transportation system is one of the most important problems affecting development in Prince William County. Transportation planning must be carried out on a county-wide basis with sufficient short-range and long-range goals to assure that the County's future needs are met as development takes place.

It is anticipated that over the next five years, development will continue to expand beyond the limits of its present boundaries. Plate 14 shows this projected expansion. The plans and policies which have been outlined in this transportation study should provide the guidance needed to solve many of the present problems affecting the County as well as to aid significantly in providing transportation facilities for future development over this short-range period. Much of the added development shown on Plate 14 is already committed in terms of zoning, development plan submissions and sewer capacity projections and programs.

The long-range improvements to the major thoroughfare system proposed in this study are based upon an assumption of continued growth and the need for further improvements to the County's major thoroughfare system. Long range land use alternatives have not been presented here. At such time that a long-range land use plan is considered, the long-range transportation system should be studied in greater detail to assure compatibility.



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COMPREHENSIVE PLAN FOR PRINCE WILLIAM COUNTY, VIRGINIA

SECTION II WHERE ARE WE GOING?

Part B

THE ENVIRONMENTAL MANAGEMENT PLAN

Adopted November 1974

PRINCE WILLIAM COUNTY PLANNING OFFICE

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Donald W. Turner, Vice-Chairman

Vernon D. Dawson

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John M. Piercy, Jr.

Chris D. Thomaidis

A part of the comprehensive plan for the physical development within the jurisdiction of Prince William County, pursuant to the provisions of Title 15.1 Chapter 11, Article [illegible] the Laws of Commonwealth of Virginia.

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PRINCE WILLIAM COUNTY

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The Citizens of Prince William County

Ladies and Gentlemen:

It is our pleasure to present herewith the Environmental Management Plan for Prince William County, adopted by the Board of County Supervisors by Resolution #75-14-25 of November 12, 1974.

This plan is an integral portion of the Comprehensive Plan for the physical development of Prince William County. The Environmental Management Plan focuses on two main elements: the identification of areas of the County which are especially sensitive to development (critical environmental areas) and policies designed to protect both these sensitive areas in particular and the County-wide environment in general.

Several public hearings were held on this plan by the Planning Commission and the Board of County Supervisors. The interest and assistance of County citizens have been beneficial to the development of this adopted version. While the plan will be modified periodically, it is hoped that it will serve as a basis for the County's development. As such, it should be of considerable assistance in building a finer County.

Respectfully presented,

Charles J. Colgan, Chairman
Prince William County Board of Supervisors

HGB/sah

PRINCE WILLIAM COUNTY
ENVIRONMENTAL MANAGEMENT PLAN

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THE ENVIRONMENTAL MANAGEMENT PLAN

Introduction

The recent level of increased environmental awareness in the nation has occurred as a response to obvious and direct threats to health and to the dramatic loss of natural or cultural resources. Powerful images such as smog shrouded cities, dying Great Lakes, and rivers on fire commanded public response. The response initially came in the form of specific regulations and programs designed to ameliorate a current or obviously imminent crisis.

As the interdependence of natural processes became more widely appreciated nationwide, the inadequacy of an uncoordinated approach to environmental programs became apparent. In 1969, this awareness resulted in the National Environmental Policy Act which requires every Federal agency to assess in detail the environmental effects of its proposed projects. An environmental impact statement is now required for any major project utilizing Federal funds, such as an interstate highway project in Prince William County.

The Act requires that a comprehensive view of the environment be taken. Factors to be considered include economic and social effects, conservation, natural and historic landmarks, noise, air and water pollution. The need for such a wide view of the environment is now self-evident. In the past, public and private decisions based on a narrow view have resulted in undesirable and sometimes disastrous consequences.

ENERGY SHORTAGE

The far reaching effects of the energy shortage have demonstrated that not only are natural processes interdependent, but that man's economics and social affairs are inextricably tied to the natural world.

It is now clear that the waste of finite resources is not only uneconomic, but may have unexpected negative effects. Land use decisions which result in suburban sprawl provide a case in point. Not only does sprawl waste land, cause unnecessarily extensive water and sewer lines, roads, telephone lines, and the like, but may make mass transit uneconomic, if not impossible. Mass transit is seen as one of the primary means for reducing energy consumption.

In this context, environmental management is not a luxury, but is rather an absolute necessity.

ENVIRONMENTAL MANAGEMENT OBJECTIVES

The following general objectives are the framework within which the Environmental Management Plan has been created.

The following general objectives are the framework in which the Environmental Management Plan has been created.

1. Provide a quality environment for Prince William County.
2. Protect the County's soil, air and water resources.
3. Protect critical environmental areas.
4. Protect historic sites.
5. Preserve the rural charactor of the County in areas not planned for development.
6. Preserve the unique village environments of the small towns in the County.
7. Channel growth into areas which may be developed with minimum environmental damage.
8. Regulate the development process to minimize environmental damage.

To understand how these objectives may be pursued, a discussion follows of current environmental problems in Prince William County.

1 Environmental Problems

The most pressing environmental problems facing the County are largely associated with the extremely rapid population growth experienced since 1950. The population rose from 22,612 in that year, to 111,102 in 1970. As a result of this rapid growth, with its attendant extensive conversion of land to suburban uses, a number of environmental concerns have become manifest.

FLOODING

As "Hurricane Agnes" has made clear, residential and other vulnerable uses have been located in Prince William County's flood plains. Unfortunately, a structure which is not now in a flood area may become so, as upstream development increases. For example, the town of Occoquan is currently subject to markedly increased flooding since high density residential units have been constructed higher in the watershed. The same is true for subdivisions close to Flat Branch, in the Manassas area.

When land is changed by construction to a higher intensity use, a number of factors increase the flood hazard. Changes in the contours of the land may increase the quantity and velocity of storm water runoff. Development also increases the amount of impermeable surfaces such as streets, parking areas and roofs which, of course, greatly increases runoff by reducing absorbtion. It should also be noted that lawns absorb very little storm water, so that the change from a wooded area (generally the most efficient for moderating runoff) to a lawn may markedly increase the potential of downstream floods.

In recognition of these problems, the County has declared two watersheds -- the Flat Branch and the Marumsco -- as critical watersheds, as noted in Section One. In addition, the County has adopted a storm water policy which requires that no greater runoff shall occur from any site after development than before the land was disturbed. Administratively, a 10 year frequency storm is being used as a base line.

In addition, the County has sought and received eligibility for flood insurance for its residents.

While the subdivision ordinance of the County does prohibit residential construction in the flood plain, it is clear that a detailed flood plain zone is needed.

EROSION AND SILTATION

The erosion of the soil, the transport of the resulting silt by water and its deposit at the mouth of rivers is a natural process which occurs without the intervention of man. However, in an area where, for example, two inches per acre of silt may be expected in 100 years from natural processes, this level may be reached in less than a single year from intense development. The resulting massive siltation of streams kills fish, destroys vegetation, and changes downstream channels. It also deprives the eroded areas of needed topsoil.

A number of factors determine the actual quantity of silt from a given development. The erodability of the particular soil involved and the degree of slope are prime determinates of potential erosion. Given the nature of the site, the proposed use and the construction practices employed determine the actual siltation experienced.

Projects that involve the total removal of vegetative cover, and subsequent massive grading provide the greatest hazard. Some projects, such as shopping centers or warehouses that require large amounts of flat land, should not be constructed in areas of steep slopes or erodable soils since even the employment of sophisticated construction practices cannot insure the prevention of off-site siltation. In contrast, such hilly, erodable areas would

successfully be developed with minimum environmental damage for single family homes at very low densities, providing that the maximum amount of existing vegetative cover is left undisturbed and that disturbed areas are exposed the minimum amount of time.

In addition to the County's erosion control ordinance, the Board adopted, in 1970, a water pollution control law. The law reads in part:

> "Sec. 13.1-19. Pollution of State Waters. It shall be unlawful for any person to discharge, deposit or cause or allow to be discharged or deposited in any state waters of this County any wastes, rubbish, trash, garbage, dirt, soil or any matter causing or aiding pollution or to discharge, deposit or cause or allow to be discharged or deposited any wastes, rubbish, trash, garbage, dirt, soil or any matter causing or aiding pollution on any property in this County in any manner so as to allow such to be washed into any state-waters by storm or flood water."

To date, this section of the law has apparently not been used in any case relating to siltation.

AIR QUALITY

As part of the Washington metropolitan area, Prince William has increasingly been subject to air pollution alerts in the last several years. The County will, of course, be affected by the requirements of the Clean Air Act of 1970 that apply to Northern Virginia. It appears likely that the approved plans for the area will include increased emphasis on transit and disincentives for automobile commuters who drive to and park at their place of employment in and near Washington.

Another section of the Clean Air Act requires states to implement plans to avoid significant deterioration of air quality over an extended period.

On June 18, 1973, the Environmental Protection Agency issued regulations requiring states to pinpoint and analyze long range potential air pollution problems caused by "complex sources" such as stadiums and large shopping centers. In announcing the new regulations, EPA officials stressed that states or local agencies must have the power to halt construction if national air pollution standards would be jeopardized.

The states are required to set up procedures to assess the air quality impact of new facilities likely to generate significant amounts of traffic and are required to identify areas of projected growth over the next 10 years where development could violate air quality standards.

In Virginia, the State Air Pollution Control Board is preparing the initial response to the new regulations. It is likely that, at some later time, the Planning District Commissions will become involved. When this occurs, the member governments of the commissions will undoubtedly participate in the planning process. It is very likely that proposed development in Prince William County will be subject to "complex sources" regulations.

At the local level, Prince William adopted an Air Pollution Control Ordinance in 1970. The law creates a Division of Air Pollution Control within the County Health Department. The ordinance regulates the emission of smoke, particulates, gasses and odors. The maximum sulfur content of fuel oil burned in the County is specified and open space burning is controlled.

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Division of Air Pollution Control within the County Health Department. The ordinance regulates the emission of smoke, particulates, gases and odors. The maximum sulfur content of fuel oil burned in the County is specified and open space burning is controlled.

The law also provides powers to reduce or discontinue operation of air pollution sources in the event of an emergency.

The Health Department currently has two air monitoring stations operating -- one at the Garfield Administration Building in eastern Prince William and one in Manassas. The stations monitor oxidants (elements that react with sunlight to produce smog), particulates, and sulfur dioxide.

WETLANDS

As noted in Section I, the State of Virginia has enacted legislation to protect wetlands. The act defines wetlands as follows:

> "Wetlands means all that land lying between and contiguous to mean low tide and an elevation above mean low water equal to the factor 1.5 times the mean tide range at the site of the proposed project...; and upon which is growing on July 1, 1972 or grows thereon subsequent thereto any one or more of the following...." (Here follows a list of 34 plants common to set areas)

The act lists nine groups of activities permitted in Virginia wetlands. These activities provide for fishing, hiking, swimming, hunting and the like. Wetlands of primary ecological significance are not to be altered or disturbed.

Any proposed use of Virginia wetlands not specifically provided for requires a permit. The regulating authority may either be a local wetlands board or the State Commissioner of Marine Resources (Commissioner of Conservation Development and Natural Resources after July 1, 1974.)

In the event the locality chooses to regulate its own wetlands, the act provides that a local wetlands zoning ordinance may be adopted. This ordinance enables the locality to appoint a wetlands board to hear permit requests. However, decisions of this board may be appealed to the State Commissioner.

If the locality does not adopt the local ordinance, then the act provides that the Commissioner shall hear petitions for permits. In other words, if the locality chooses not to regulate wetlands, the Commonwealth will.

SOLID WASTE

The sanitary landfill is the method presently used in Prince William for refuse disposal. The County landfill is located at Independent Hill. By resolution of the Board of County Supervisors, completed sections of the landfill are to be converted into recreational facilities. The County presently has plans for several ballfields, tennis courts and similar uses. At the current rate, the County landfill will be exhausted in approximately seven years. However, there are plans for acquisition of adjacent land.

The sanitary landfill disposal method with the subsequent development of recreational facilities, is probably the best conventional method available. However, as the technology of waste reclamation and recycling improves, it may be possible for the County to improve on simple disposal.

1. Litter

Litter in the form of household junk, paper and beverage containers remains a serious problem in Prince William. An enforced deposit of five cents per container has been effective elsewhere and should be considered for Prince William. The County's policy of accepting solid waste at the landfill at no cost to County residents makes it inexcusable for any County resident to litter the roadside. Thousands of dollars are spent annually on cleaning up the roads. This money could be spent better on genuine road improvements.

2. Abandoned Automobile

Another particular solid waste problem that continues to plague the County is the abandoned car. Recycling of such vehicles is now not only practical but, when properly executed, profitable. The County should avail itself of any opportunity to locate an automobile recycling plant in a suitable location. New regulatory measures, and possible tax incentives should also be explored.

TREE PRESERVATION

Mature trees are a community resource, moderating the effects of wind, sun, rain and noise. The roots hold the soil and the layer of decaying wood and leaves slow storm water runoff. Rows or other groupings of trees can reduce noise, particularly in the higher frequencies above 10,000 Hz. The moisture on and around the leaves trap some air borne particulates which are subsequently removed by rain. Aesthetically, large mature trees soften architectural lines, provide variety, define space and act as pleasing masks to unpleasing views.

The wholesale destruction of mature trees either for short run economic gain from the sale of timber or for the "convenience" of construction equipment operators is short-sighted and in many cases self defeating.

In the case of homesites, the wooded lot in many cases sells for more than it costs the developer to maintain the trees during construction. While room must be provided for construction equipment and, of course, the actual site of the building must be cleared, careful site design and good construction practices can preserve most of the mature trees.

Logging in areas to be left as open space or to be dedicated to the public such as schools, parks, etc., simply passes the legacy of increased erosion, flooding and visual blight to the public. Such destruction of land which has been slated for public ownership should be prohibited, unless carried out in the context of a development plan for the site involved.

Construction methods generally followed by several developers in the County call for the logging of the entire tract which is slated for development. Following this step, the area is cleared of stumps and undergrowth. The top soil is subsequently scraped off and sold or used elsewhere. In rough areas, earthmoving equipment then completely relandscapes the area with massive cuts and fills to provide homesites that will be topographically suitable for the pre-designed, mass-produced homes that are placed on each lot.

These practices have not been matched by adequate requirements that prevent erosion and protect downstream areas from siltation. No controls exist that effectively circumscribe such activities to limited areas. Preservation of existing natural cover has not been required in areas such as stream valleys or buffer zones. Experience has also shown that in rough terrain, the bulldozer approach leaves steep, unusable yards where landslides occur as well as difficult drainage problems that homeowners are unable to resolve.

An example of regulations in force in another large planned community (Columbia, Maryland) is given in

Appendix A. These stipulations are part of the sales agreement between the developer and the builders in Columbia. These regulations demonstrate that the bulldozer approach is not the only feasible approach to development.

While this approach may as yet be too restrictive for use as a local ordinance in Prince William County, consideration should be given to enactment of an ordinance that seeks to protect the natural vegetation existing in stream belt areas, buffer zones and in other land not used for construction within developments.

VISUAL BLIGHT

While agreement on what is visually pleasing may be difficult to arrive at, the determination of extreme ugliness is far easier. There can be little doubt that the highly visible open dump, the automobile graveyard, or the visual chaos of most strip commercial areas are all subject to a consensus view of visual blight.

Open dumps may be prohibited as a health hazard, and screening may be required between incompatible uses, but the basic issue of public control over design is a difficult one.

Recent decisions in the courts suggest a growing recognition of the judiciary that, particularly in demonstrably scenic areas, the public welfare includes the maintenance of the visual environment.

The primary regulatory control of Prince William County that is applicable to this concern falls within the land use control laws. The County may regulate setbacks, signs, screening and, through the special use permit, specific undesirable uses, such as new auto graveyards. However, it is apparent that the County has not been highly successful in curbing visual blight -- particularly in strip commercial areas.

PROTECTION OF OPEN SPACE, AGRICULTURE, AND FORESTRY USES

In February of 1973, the Board of County Supervisors adopted the Open Space Ordinance which provides for property tax relief for land used for agricultural, horticultural, forestry or open space.

The provisions of the ordinance have been discussed widely, and need not be repeated here.

The act is intended to help preserve land used for the above purposes by providing economic incentives. However, this purpose can be greatly strengthened by creating a Rural-Agricultural (RA) zoning district to apply to all land granted tax relief. The provisions of such a zone should permit agricultural, horticultural, forestry and open space uses, with a minimum acreage for residential use of not less than 5 acres.

Such a zone should be adopted by the County for all areas where desired by the owners.

Plate I identifies parcels currently subject to tax relief under the Open Space Ordinance.

HISTORIC PRESERVATION

As noted in Section One, Prince William has established an Historic Commission and included an Historic zoning district in the local code. To date, no action has been taken to formally establish an historic register or to rezone historic landmarks.

The lack of concrete action is of concern since a recent fire destroyed Waverly (a potentially historic building), and other landmarks such as Signal Hill are

threatened by new suburban land conversion.

A preliminary identification of sites is shown on Plate 2.

VILLAGE PRESERVATION

Prince William County presently contains a number of towns and villages that offer unique historic and cultural values which may be worthy of preservation in the public interest. A list of these common ties might include Occoquan, Brentsville, Bristow, Nokesville, Greenwich, Buckhall, Buckland and Haymarket (Plate 2). The unique historic or cultural values may be defined as follows:

An historic landmark, as identified by the Prince William County Historic Commission.

A street and lot layout that is representative or typical of small communities built during the nineteenth or early twentieth century.

A small community which exhibits the setting, land uses, institutions and architecture of a rural village of the nineteenth or early twentieth century.

Unless protective measures are taken soon, the unique values of these small communities may be destroyed by the spread of new suburban development.

Measures should be designed to protect the values that are present in these communities. Such measures need not be negative nor confiscatory, nor designed to prevent all development. They should permit development, if possible, which is consistent with or which enhances the values being preserved. It should be remembered that there are usually several feasible alternatives for developing a piece of property: What is important is that the alternative selected optimize the protection of historic or cultural values rather than optimize some other variable. The result may highly be beneficial to the land owner as well as to the general public.

1. Community Interest

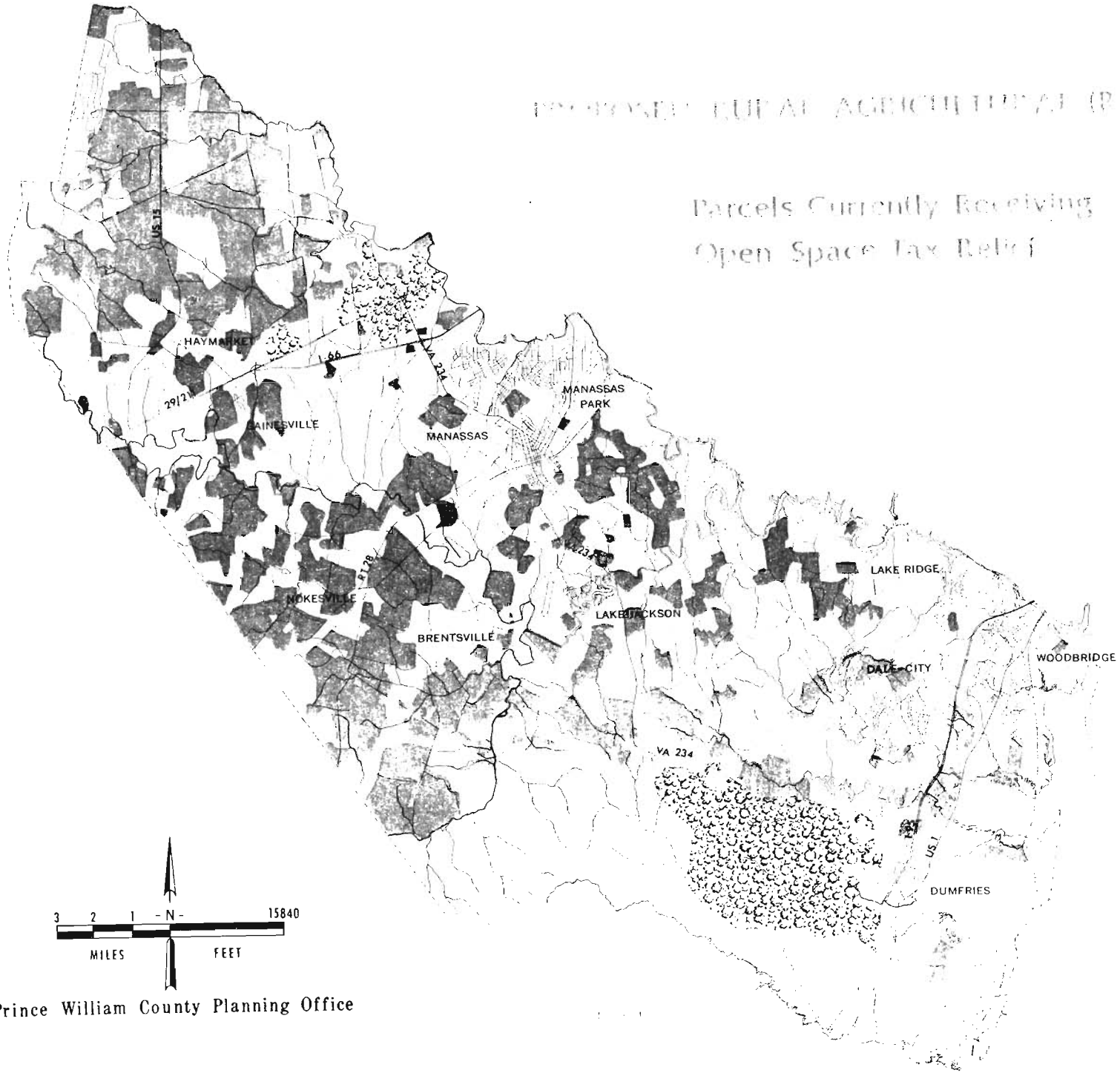
The successful preservation of the "character" of the small towns and villages of Prince William County rests fundamentally on the level of community interest in such a goal and on the ability of the various landowners to agree on a common course of action.

A high level of community interest is most likely in areas that have unique or easily recognizable historical, architectural, or cultural assets. Also important is a tradition of community identity and self-awareness, as well as of concerted community action. In many cases, some imminent "threat" to the values of the community must be present in order to catalyze civic action.

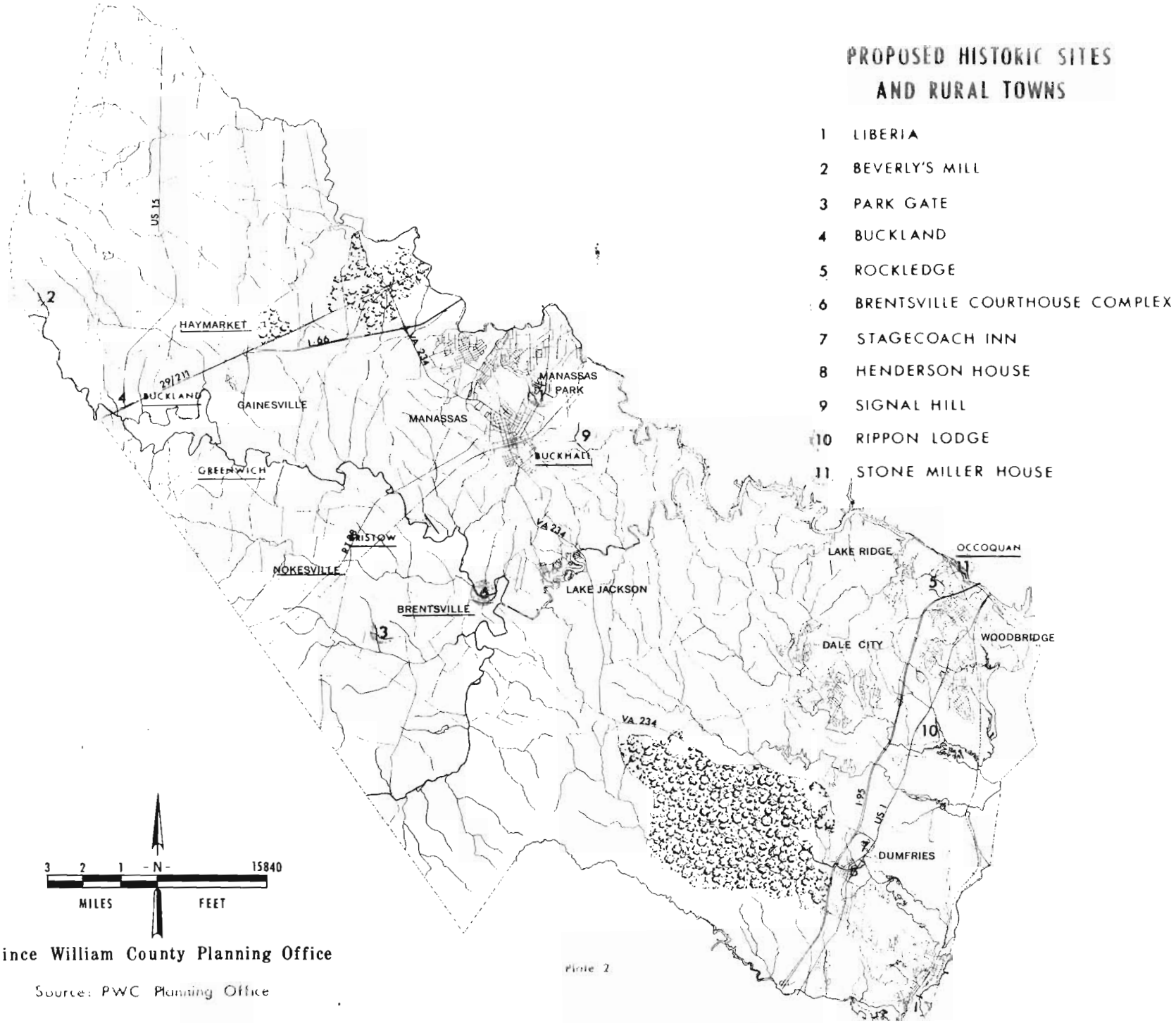
Without a high level of interest by the affected community, it is doubtful that any positive steps to achieve substantial preservation could be achieved, since the tools and resources of the County government and other public agencies are presently limited in this area. A successful program of village preservation must begin in the affected community and receive its continued support.

2. Existing Opportunities for Public Action

Of the various powers exercised by the County, only planning and zoning appear to have any statutory application to this matter. Acquisition of land and/or structures by a public body through eminent domain or otherwise is impractical for this purpose.



Prince William County Planning Office



Prince William County Planning Office

Source: PWC Planning Office

Plate 2

a. Zoning. As previously noted, the current zoning ordinance of Prince William County does make provision for an Historic Zone which has not yet been utilized. Such an approach may be used successfully, where clearly identifiable, historically significant landmarks are present and in need of protection through zoning. Such landmarks must be identified by the County Historical Commission, prior to being placed in the Historic zone. Adjoining land may also be placed in the historic zoning district, if it is shown to be necessary in order to fully protect the landmark in question.

This approach could apply in several villages in Prince William County, such as Brentsville, Buckland and Haymarket, where historic landmarks exist. (Plate 2) It is of very limited usefulness for preserving entire communities, unless it can be shown that such action is necessary to protect historic landmarks. A zone created specifically for controlling development in villages would probably not be legal, because it would contain provisions that are beyond the current enabling legislation of the Commonwealth. Architectural control by zoning is also of dubious validity, except where historic preservation is an issue.

b. Planning. Through the process of comprehensive planning, villages and towns which should be preserved may be identified. Nearby land uses may be planned for compatible uses. However, planning must be viewed as a beginning rather than as a solution. The most effective approach would be to combine concerted private action with public support.

3. Private Action

There are various tools that a community of landowners might use to regulate changes in the environment of the area.

Some of these possibilities are discussed below:

a. Easements. An easement is a legal restriction imposed on the use of a parcel of land for the benefit of someone other than the owner. Easements are created by deed or by will. All easements can be classified as either easements appurtenant or easements in gross.

An easement is appurtenant if it is created for the benefit of an adjoining landowner and his successors in title. If, on the other hand, the easement is for someone other than an adjacent landowner and his successors, it is an easement in gross.

The easement could be used to prohibit or regulate development. A series or interlocking easements appurtenant could be used to regulate growth in an area.

An easement in gross can be assigned to a public agency, a foundation or other private agency.

Utility companies acquire rights of way by purchasing easements in gross.

A private organization could seek to purchase preservation easements from property owners or seek their donation. Such an organization could be specifically created for the purpose.

Easements are supported by covenants that are attached to the land.

b. Covenants. Restrictive covenants are attached to the land with the owner in fee simple being bound by the restrictions. Such restrictions "run with the land"; that is, the restrictions continue to apply to the land after sale to another party.

In effect, such covenants act as a contract agreed to by the buyer when the land is purchased.

In general, covenants are independent of zoning or subdivision controls. A use that is permitted in the zoning ordinance in a particular location may be prohibited by covenant in which case that use could be enjoined.

If on the other hand, the covenant permits or encourages a particular use that is prohibited by zoning then, of course, the zoning would prevail.

The usefulness of restrictive covenants for village preservation is governed by the number of landowners willing to place such restrictions upon their land.

The most effective approach would probably be in the form of an organization of property owners who jointly restricted their land. The organization would then enforce the terms of the covenants.

The terms of the covenants could contain provisions relating not only to land uses, but to architectural controls, set backs, signs, lighting and other matters. In this matter, development is not prohibited. Rather, controls designed to keep development consistent with community values are applied when development occurs.

c. Private Organizations. There are various types of private organizations that might be utilized.

d. Home Owners (or Property Owners) Associations. Typically, a home owners association is an incorporated association of property owners, holding fee simple title to common areas within a legally defined boundary of a residential subdivision. By virtue of fee simple to an individual residential lot of record, the property owner holds automatic interest in the association and is granted rights of enjoyment jointly with the entirety of property owners to the common areas. In addition to such rights, he assumes joint responsibility for the maintenance and the operational costs associated with the common areas and facilities deeded to the corporate body. He takes title to his land subject to the terms and conditions established in the land covenants.

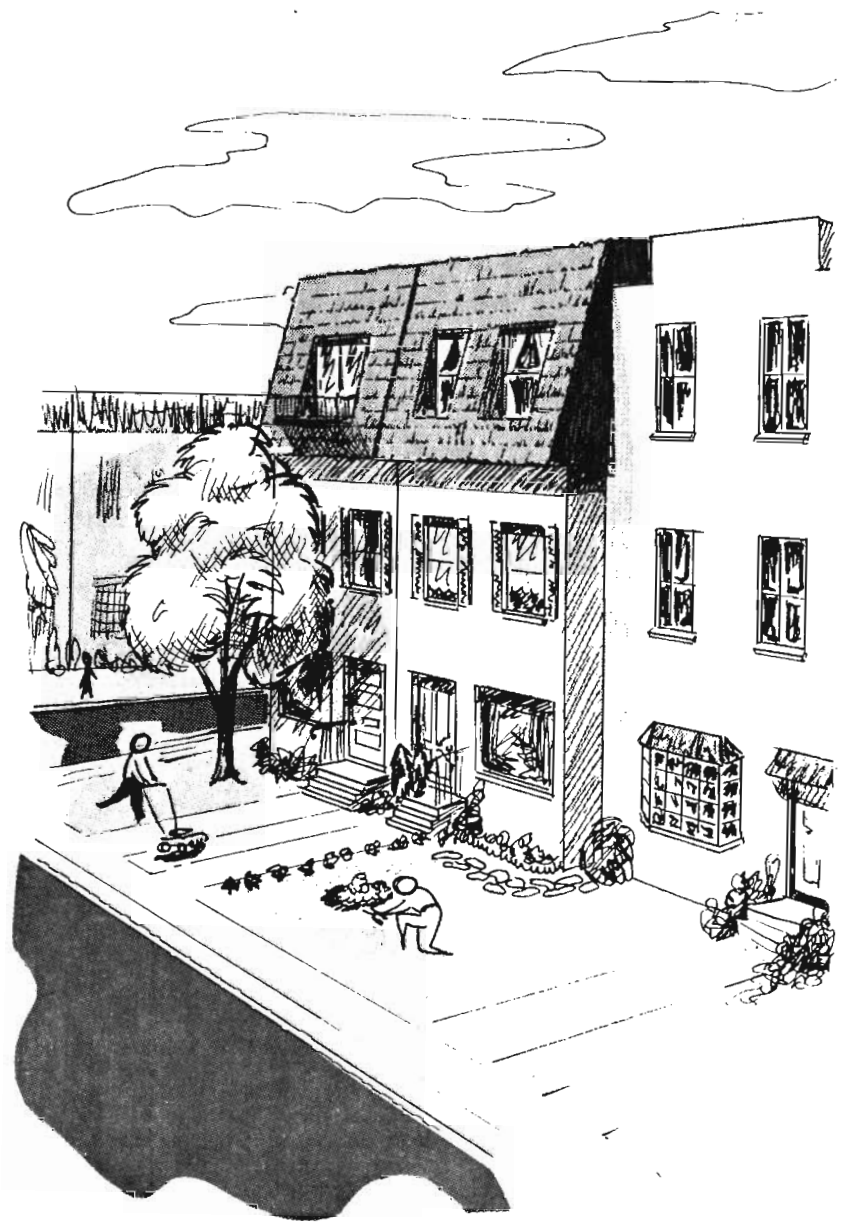
Some large home associations such as in Reston, Va., or Columbia, Md., undertake recreational programs, provide transportation to the residents and provide other quasi-governmental functions.

It would seem that such an association could be formed of existing landowners to serve as the vehicle for creating and enforcing covenants which regulate the erection of structures, architectural style, heights of fences, maintenance of building exteriors, and which require approval of the resident body for individual improvements.

e. Cooperatives. A cooperative is an association in which each resident is a stockholder of a corporation owning all the land and improvements and is a tenant of such lessor corporation. In other words, individual residents have stock ownership in the cooperative and the right of occupancy to a specific unit. In a cooperative the shareholders collectively pay the operating costs, including taxes for the entire project, and assume individual liability for the indebtedness of the corporation.

Such an organization would likely be very difficult to create from existing landowners.

f. Other Organizations. Another possibility is a foundation or trust which could be county-wide (or state-wide or national, such as the National Trust for Historic Preservation). Also possible is a real estate syndicate which is a general partnership with sub-partnerships or joint ventures. The general partners are few in number, exercise joint control over investment and property management and are individually liable for partnership obligations. Each general partner enters into a sub-partnership or joint venture relationship with many people who wish to participate in the enterprise through ownership of a portion of the general partners interest. The general partner enters into a participating agreement with these people and acts as agent for them. He must have their consent to major actions such as sale, mortgage, or transfer of the partnership interest.



2 Environmental Management

While many factors have combined to produce Prince William County's current environmental problems, it must be recognized that some factors can be influenced but not directly controlled by the County. Included in this category are actions of other local governments in the area, the State of Virginia, the Federal Government and many actions of the private sector.

In formulating an environmental management plan for Prince William County, recognition must also be made of the limitations of the financial and legal resources of the County. In this context, the plan, while recommending measures that can be taken in the short range, also recognizes that an ongoing, long term effort will be required.

THE PLAN

This plan is conceived of as a beginning framework for establishing an environmental management program.

The plan focuses on two main elements -- the identification of areas of the County which are particularly sensitive to development (Critical Environmental Areas) and the adoption of policies designed to protect both these sensitive areas in particular and the County-wide environment in general.

B. CRITICAL ENVIRONMENTAL AREAS

As noted in Section One, several studies of Critical Environmental Areas (C.E.A.s) that pertain to Prince William have been made by the Metropolitan Washington Council of Governments, the Northern Virginia Planning District Commission and the Virginia Division of State Planning and Community Affairs. In the latter case, the Commonwealth developed detailed criteria for identifying Critical Environmental Areas. These criteria are listed in Appendix B.

In addition to the above information, the Prince William office of U.S. Soil Conservation Service prepared a report, pertinent to this subject, describing the establishment of a protective stream belt system for Prince William. While reporting general procedures for delineating such a system, a portion of the Neabsco Creek (in the Dale City area) was evaluated by the U. S. Soil Conservation Service as an example. A protective area was identified in which development should be limited as well as possible dam site alternatives and associated water impoundment areas. Such an impoundment could serve for siltation and flood control and also for recreational purposes.

Extracts from the above report are given in Appendix C and the results of the Neabsco Study are shown in Plate 3.

1. A C.E.A. System for Prince William County

After consideration of the various preceding studies and subsequent research, an initial C.E.A. system has been delineated for Prince William. Plate 4 shows a generalized system which is recommended for adoption. The elements of this system are:

a. Flood prone areas as indicated by soils and other data.

b. Major recreational resources recommended for State acquisition such as Bull Run Mountain.

c. Wetlands.

d. Water supply protection areas such as at Lake Manassas.

e. Protective areas surrounding major cultural resources as the Manassas Battlefield Park.

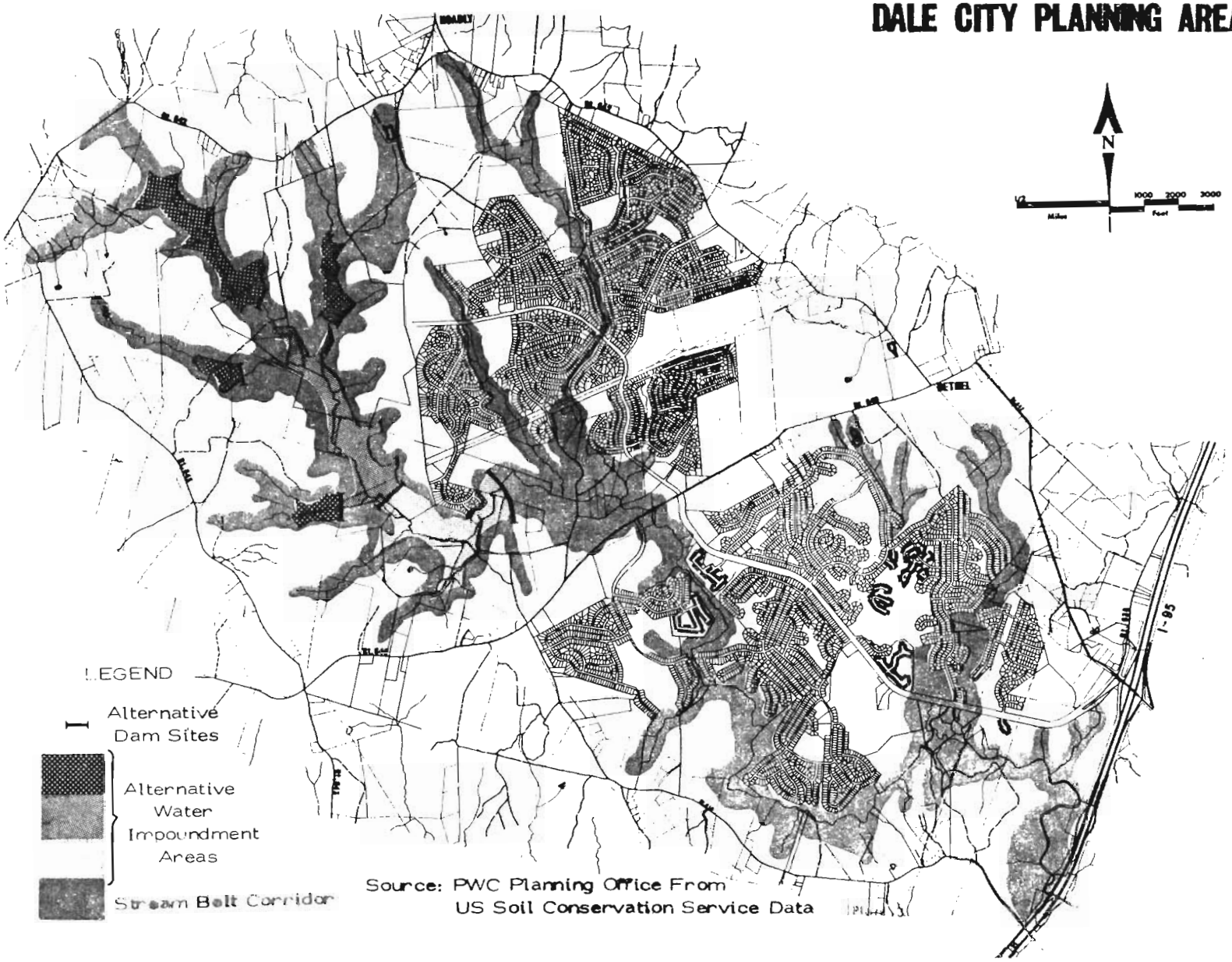
f. Major areas which combine erodable soils, very steep slopes, tree cover and which are associated with one or more of elements 1 through 5.

Two points require emphasis relative to the areas shown on Plate 2.

BOUNDARIES ARE GENERALIZED. Precise definition will be required in the future.

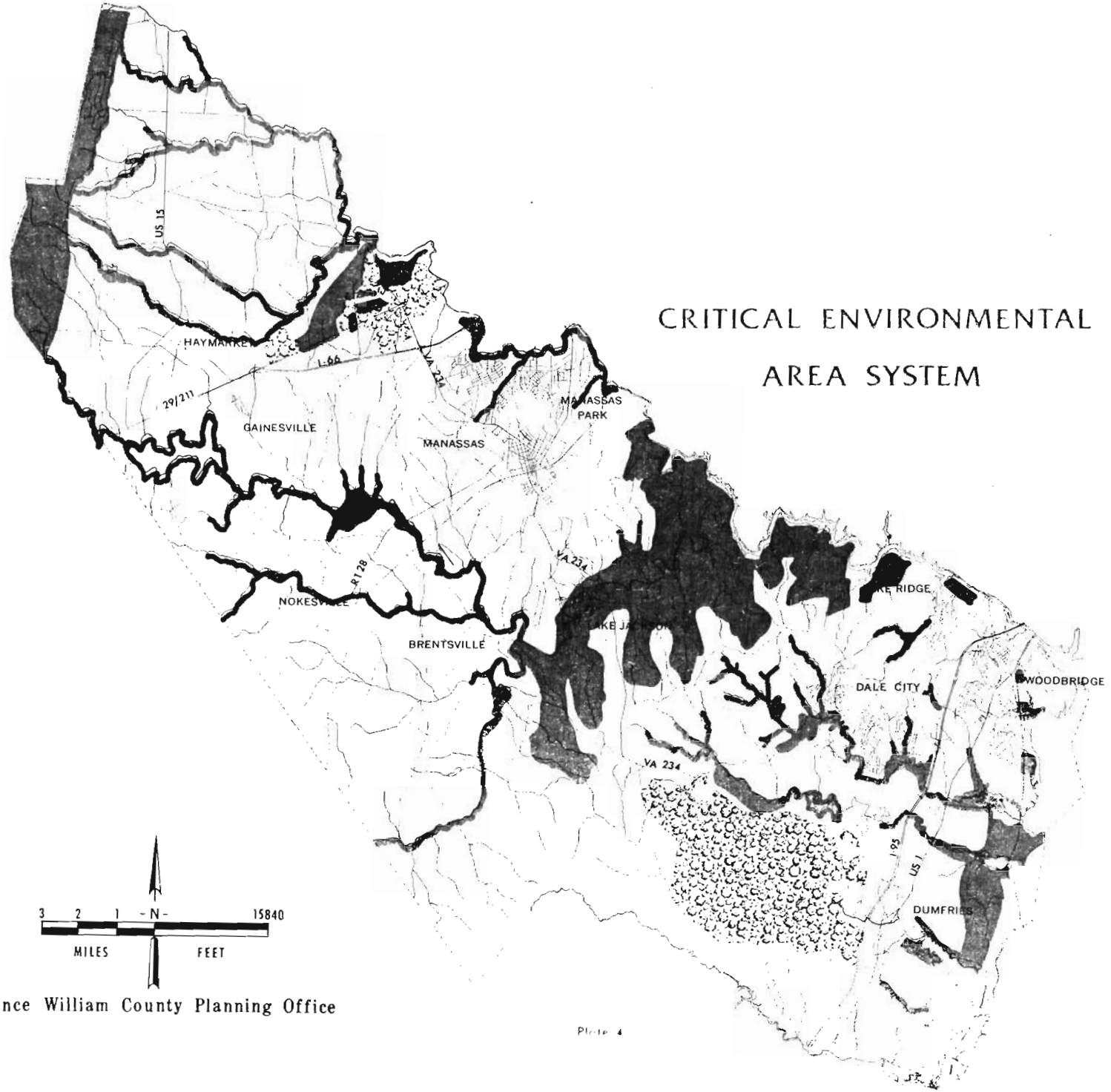
IT IS NOT THE INTENTION OF PRINCE WILLIAM COUNTY TO PROHIBIT ALL DEVELOPMENT IN CRITICAL ENVIRONMENTAL AREAS. Rather, the designation of these areas is a recognition of their sensitivity to environmental damage and the consequent need for higher standards for development than may be needed elsewhere in the County.

DALE CITY PLANNING AREA



Source: PWC Planning Office From
US Soil Conservation Service Data

CRITICAL ENVIRONMENTAL AREA SYSTEM



Prince William County Planning Office

Plate 4

3 Implementation Policies

The following policies are essential components of the Environmental Management Plan. When adopted, the policies will serve as guides for decision-making and as the outline of a program for the future.

The following concern:

GENERAL ENVIRONMENTAL POLICIES

1. Encourage energy conservation throughout the County.

2. Promote mass transit to reduce air pollution and save fuel.

3. Encourage the use of recycled products where practicable.

4. Cooperate with other governments to promote environmental programs of benefit to Prince William County and the region.

5. Fully support wherever possible private efforts to preserve historic and cultural resources such as unique buildings and the small country villages of Prince William.

CRITICAL ENVIRONMENTAL AREAS

1. Adopt Critical Environmental Areas map.

2. Strictly adhere to the following procedures:

   a. Require any proposed development in a Critical Environmental Area (prior to rezoning, subdivision, or site plan approval, as the case may be) to undergo a strict review to determine:

1) Whether the nature of the proposed use is in conformance with the intentions of the Critical Environmental Areas System.
Any use requiring large cleared and graded areas - such as shopping centers, major industrial uses and the like are clearly inappropriate. Scattered single family homes (or a cluster in some cases), recreational uses, forest preserves, agriculture in some areas, and the like could be consistent with the Critical Environmental Areas System.

2) Whether the intensity of the proposed use is consistent with the Critical Environmental Areas System.
The lowest density possible should be maintained in the Critical Environmental Areas. In general, no area within a Critical Environmental Area should experience a density higher than one residential unit per five acres, although clustering to achieve this net density is possible in some cases.

3) Whether the environmental protection measures proposed would insure the minimum environmental damage possible given the "state of the art" of engineering practice.
Anyone proposing significant development within a Critical Environmental Area must provide detailed plans for preservation of cover, clearing, grading, erosion control and the like, so that the County may determine that the most effective protection possible is planned.

4) Whether the proposed use will increase the demand for public facilities to be located in the Critical Environmental Areas System.
It is the intention of the County that mini-

mum disturbance of Critical Environmental Areas occur so that any proposed use permitted must not markedly increase the demand for public facilities (such as schools, new roads, and sewer and water systems) within the Critical Environmental Area.

b. Continue detailed CEA delineation as part of the comprehensive area planning process in conjunction with the Soil Conservation District and other appropriate parties both public and private.

c. Encourage landowners to apply for "down zoning" to the lowest possible density*. Such owners may seek the benefits of tax relief where appropriate under the Prince William County Open Space Ordinance as authorized under 58-769.5 - 58 - 769.12 of the Code of Virginia.

* Proposed R-A Zone if enacted.

IMPLEMENTATION OF EXISTING ORDINANCES

1. Fully implement the Historic District (Article X(D) 20-88.40 - 20-88.43, Code of Prince William County).

a. Identify historic sites.

b. Apply the provisions of the District.

2. Strictly adhere to the provisions of the various land use control ordinances -- i.e., zoning, site plan, subdivision, erosion control -- to insure that the conduct of development complies with the County's environmental standards and objectives.

3. Utilize the zoning power to prevent further development of strip commercial areas.

4. Investigate the feasibility of enforcing the water pollution ordinance to control sediment discharge.

IMPROVEMENT OF EXISTING ORDINANCES TO PROMOTE THE ENVIRONMENTAL OBJECTIVES OF PRINCE WILLIAM COUNTY

1. Reevaluate provisions of the zoning, site plan, subdivision, air pollution, water pollution, and erosion control ordinances, and adopt stricter measures if needed.

ADOPTION OF NEW CONTROLS

1. Adopt a local wetlands ordinance as authorized under the Code of Virginia.

2. Adopt a Rural-Agricultural zone providing for very low intensity use in conjunction with the Prince William County Open Space Ordinance.

3. Adopt flood plain zoning.

4. Adopt a Critical Environmental Area Zoning District.

5. Adopt a stream valley ordinance.

6. Adopt a slope protection ordinance.

7. Adopt a tree preservation ordinance.

8. Adopt a grading ordinance.

9. Adopt an ordinance to require a deposit on all beverage containers.

10. Upgrade the local building code to require energy conserving measures such as increased insulation.

4 Future Perspective

As the concepts of ecology and environment have broadened from their strictly biological definitions, public agencies have found their responsibilities increase to include new and as yet not strictly defined concepts. The public is now asked to evaluate the impact of proposed developments on the "quality of life" -- a phrase that covers nearly the entire range of physical and social planning issues.

Present trends indicate that environmental awareness will continue to expand with consequent greater demands upon the County. More sophisticated evaluation will likely be required with considerations of aesthetics -- design in land planning, for example, or architectural coherence -- as new factors in the planning process.

Review of new and increasingly sophisticated approaches to engineering practices will also be needed as the County implements its environmental objectives. For example, the complex ramifications of a stormwater retention policy will require detailed study to evolve a comprehensive system that can succeed in managing runoff throughout a watershed. Piecemeal, project by project approaches are not likely to succeed.

The County may also have to take on new and unfamiliar roles. The regulatory function alone may not be sufficient to accomplish its objectives. Proposals for land banking, for the purchase of scenic easements, and for new changes in tax policy may have to be investigated.

In summary, it seems likely that environmental concerns will continue to increase in importance as the County grows and Prince William County must prepare to respond.

Appendix A

(Sample regulations in use in Columbia, Maryland. These procedures are part of the binding agreements between the developer and the individual builders.)

Tree Preservation Procedure (March 24, 1970)

1. All trees that have a diameter of 6" or more at a point 12" above the ground line must be located on a topographic map with one foot contour intervals, 50 scale or larger; each tree must be identified by size and species (e.g. 30" Oak, 24" Maple, etc.). Prior to any design work, each applicant must present this information to The Architectural Committee and request that a visual analysis of the site be carried out to determine which trees and other natural features are worthy of preservation (e.g. views, rock formation, etc.). Site plans shall preserve the maximum number of desirable trees and other natural features. Wooded areas that are clearly defined on the site plan for preservation and which are not to be disturbed by any construction may be eliminated from the tree location survey. The applicant shall be held responsible for the protection of these undisturbed areas.

2. The following determinants shall be used in selecting trees to be saved: a circle, radius equal to one foot (1') per inch (1") of caliper, shall be drawn around the tree (considered nominal branch spread). If two-thirds of the area can remain undisturbed at original grades, the tree can be saved without special treatment.

3. All site plans, including preliminaries,shall show individual water and sewer connections, and shall indicate, by using an approved color code, both those trees which are to remain (red) and those trees which are to be removed (white).

4. After the final site plan has received Architectural Committee approval, those trees which are to remain shall be marked in the fields by the builder and protected in an approved manner. Trees and tree areas within the construction site which are to remain undisturbed shall be encircled with a fence for protection. (Snow fencing or other approved methods.) Fencing shall be placed at least five feet (5') from all areas indicated to be undisturbed, and such fenced areas shall be regarded as off limits for any construction activities.

5. Each applicant shall diligently undertake to prevent the removal of or damage to any tree which is designated for preservation. Damage or destruction of any such tree shall be the responsibility of the applicant whether caused by the applicant, its agents, employees, contractors, or licensees. Examples of ways in which trees are damaged or destroyed are as follows:

   a. Placing backfill in protected areas.
   b. Felling trees into protected areas.
   c. Driving construction equipment into or through protected areas.
   d. Burning in or in close proximity to protected areas.
   e. Stacking or storing supplies in protected areas.
   f. Changing site grades which cause drainage to flow into, or to collect in protected areas.
   g. Conducting trenching operations in the vicinity of trees.
   h. Grading in the vicinity of trees.

All trees which are not to be preserved are to be removed in a manner that will not damage those trees which are to remain. Any trees that are to remain that have been damaged during the clearing operation must be repaired in an approved manner or by a tree expert as soon as final clearing has been completed.

6. Nothing contained herein shall take precedence over any rule or regulation promulgated by a government agency.

7. After construction is completed, temporary barriers, surplus materials and all trash, debris and rubbish shall be removed from the site. All backfill shall be clear of building material, stone and rubbish.

Approved Tree List

Deciduous Shade Tree Planting in Residential Areas

All shade trees planted in Columbia shall be selected from the following approved list.

Scientific Name	Common Name
*Acer rubrum	Red Maple
*Acer saccharum	Sugar Maple
*Fagus sylvatica	European Beech
Fraxinus excelsior	Blue Ash
Fraxinus lanceolata	Green Ash (Seedless)
*Ginkgo biloba (male only)	Maidenhair Tree
*Gledistla triacanthos inermis	Thornless Honey Locust
*Liquidambar styraciflua	Sweet Gum
*Metasequoia Glyptostroboides	Dawn Redwood
*Nyssa sylvatica	Black Gum - Tupelo
*Phellodendron amurense	Amur Corktree
*Platanus acerifolia	London Planetree
*Pyrus calleryana bradford	Bradford Pear
Quercus alba	White Oak
Quercus borealis	Northern Red Oak
*Quercus coccinea	Scarlet Oak
*Quercus palustris	Pin Oak
*Quercus phellos	Willow Oak
Quercus velutina	Black Oak
Sophora japonica	Chinese Scholartree
*Tilia americana	American Linden
*Tilia cordata	Littleleaf Linden
*Tilia euchlora	Crimean Linden
Tilia tomentosa	Silver Linden

Other trees of the above genera and others may be accepted on written request, and written reply of approval from the Agricultural Committee such as:

Plantanus occidentalis	American Sycamore

Recommended Size for Planting -
2 - 2 1/2" Caliper 12 - 14' or larger

*These trees are recommended by the University of Maryland

All trees must be balled and burlapped and planted with proper planting soil, a long-lasting fertilizer, mulched and properly staked. (See enclosed). All planting methods are to be in accordance with U.S.A., Standard for Nursery Stock published by the American Association of Nurserymen.

All plants shall be guaranteed for one full growing season (April to November) after planting. Any plants not in healthy growing condition at the expiration of guarantee period shall be replaced by the Contractor, at no cost to the Owner.

The following trees may not be planted.

Acer negundo	Box Elder
Acer dasycarpum	Silver Maple
Acer pseudoplatanos	Sycamore Maple
Gleditsla triancathos	Thorny Honey Locust
Lirodendron Tulipifera	Tulip Poplar
Prunus Serotina	Black Cherry
Robinia pseudoacacia	Black Locust
Maclura pomifera	Osage Orange
Populus alba	White Poplar
Populus - all other species	Lombardy Poplar

Appendix B

Critical Environmental Areas

As noted in Section I, the State of Virginia has begun identifying "Critical Environmental Areas", (CEA), throughout the Commonwealth. The working definition of a CEA (See Section I) has been clarified by the development of a set of criteria for evaluating CEAs.

Criteria for Evaluation

1. Criterion: A critical environmental area is an area which has unusual natural or man made features which are worthy of protection by State or local governments. These natural or man made features might consist of:

   (a) Groupings of historic buildings located within relatively undisturbed contiguous natural areas.

   (b) Roads through undisturbed countryside containing scenery and buildings uniquely historic and representative of Virginia.

   (c) Natural wildlife habitats supporting unique fish or wildlife populations, species whose range in the State is restricted, or whose numbers are so limited as to warrant special consideration.

   (d) Natural areas possessing unique physical characteristics such as:

      (1) Beaches having unusually white sand, exceptional width, good water quality, or dune development.

      (2) Bluffs having unusual exposed geologic strata, or beautiful vistas.

      (3) Inland river banks having wild character, profuse blooming flora communities, unusual crystalline beauty, or exceptional water quality.

      (4) Rivers with churning action, having visual interest, waterfalls, or sinking streams.

      (5) High altitude lakes, elevated lakes in poquosins.

      (6) Unaltered mountain coves, significant peaks, natural arches, caves or tunnels.

      (7) Monadnocks, karst outcrops and other unusual geological formations.

      (8) Spectacular gorges.

      (9) Climax forest communities of mature individuals.

      (10) Forest communities at range limits such as balsam fir, red spruce and arbor vitae.

      (11) Endangered forest species such as native chestnut and elm.

   (e) Areas possessing qualities suitable for future park development such as:

      (1) Being accessible from population centers and well traveled tourist routes.

      (2) Having good scenic qualities yet relatively level terrain to permit the construction of any necessary facilities.

      (3) Possessing bodies of water or potential pond and lake sites.

(4) Being a relatively large and undeveloped tract.

2. Criterion: A critical environmental area is a natural area which is critical to an ecological system and should be protected from inappropriate development. Such areas will not readily support intense development or may be hazardous to the public health and safety. Areas within this category might include:

(a) Flood plain areas with special flood hazards and those which are located within the one hundred year flood level.

(b) Areas of severe topography where it is difficult to locate structures. Steep slopes with shallow soil profiles making it impractical to install sub-surface sewage disposal facilities, to find adequate soil for cut and fill, and to find sufficient water of adequate quality for a domestic water supply. Where underlying rock formations make it possible for rock or earth slikes to take place after heavy precipitation.

(c) Low wetlands, dominated by salt-marsh cordgrass, which are regularly inundated at high tide. These areas are critical to the production of detritus, an important link in the food chain for nearly all marine life, and serve as spawning, breeding, or feeding grounds for many marine species.

3. Criterion: A critical environmental area, includes certain natural, scenic, or historic areas which are presently endangered, or in obvious danger of destruction, alteration, or loss because of the activities of man. Activities which might create a danger to the natural environment include:

(a) Existing or potential urbanization whose rate or intensity of growth exceeds the capacity of an area to support it without itself being substantial despoiled.

(b) A major public or private facility or improvement which would significantly alter the natural or historic environment.

(c) Power generation and transmission facilities or any facility which might pollute the water or air, or despoil the natural, scenic, or historic qualities of an area.

4. Criterion: A critical environmental area is an area appropriate for public use through future acquisition by State or local agencies. Many types of natural areas could qualify for public acquisition; however, uses to which this land might be put include:

(a) parks

(b) historic preserves

(c) game and fish management areas

(d) trails

(e) public forests

(f) scenic areas

5. Criterion: A critical environmental area is an area which can be considered to contain a primary State resource. These could include wildlife, minerals, and agricultural

production. Types of primary resource areas might include:

(a) Natural wildlife habitats of high productivity for use by man

(b) Primary agricultural production areas

(c) Primary forest production areas

(d) Mineral resource areas to include ore deposits and major quarries.

Appendix C

Streambelt Report

INTRODUCTION

This document was prepared to guide Prince William Soil and Water Conservation District in a program of assisting the local units of government in inventorying, planning, and implementing streambelt systems. It can also serve as a reference for personnel in state and regional planning agencies and to members of town and county commissions, especially those involved with planning, zoning, conservation, recreation, and beautification.

Some of the material contained in this handbook is extracted from a document published by the U. S. Soil Conservation Service in Connecticut entitled, "A Guide for Streambelts - A System of Natural Environmental Corridors in Connecticut," September, 1972. Some of the criteria for delineation of streambelts has been modified.

Objectives

The objective of a streambelt system is the identification, development, and management of a network of environmental corridors according to standards that curtail pollution and siltation, reduce hazard of flood loss, provide quality recreation areas, promote scenic beauty, and protect important ecosystems. Streambelts are intended to provide features that promote a satisfying environment and to serve the needs of people for open space.

Empirical studies, particularly those of Philip Lewis, 1/ have shown that frequently the most significant environmental resources are concentrated in a lineal pattern, generally within and along the walls of stream valleys. Lewis calls these concentrations "environmental corridors". This pattern occurs because generally such resources are now or at one time were water-related. As a result, watercourses, floodplains, steep slopes, poorly drained soils, wetlands, aquifer outcrops, important wildlife habitats, historic sites, and areas of scenic beauty may combine into a system with fairly distinct boundaries. Such an area could be considered the least tolerant to development because of its ecological importance, its scenic beauty, its recreational value, and its long-term economic value in preserving the quantity and quality of the water supply and in reducing the risks and hazards of development. Public policy, therefore, would call for retaining such areas in their open space condition. 2/

- Streambelts - A System of Natural Corridors in Prince William County

The quality of the environment for the people of Prince William is to a great degree linked to the streams and their associated lands - "streambelt environmental corridors". In these corridors of land and water are vital natural resources that deserve priority consideration with respect to land use planning and management.

1/ Philip H. Lewis, Jr., Regional Design for Human Impact (Kaukauna, Wisconsin: Thomas Publications, Ltd. 1969)

2/ Environmental Corridors were discussed briefly in the American Society of Planning Officials Report Environmental Information for Policy Formulation, Capitol Regional Planning Agency Extract. Connecticut

For most of the County, there is still time to conserve and develop the natural resources of the streambelt corridors. For the most part, urban buildup has not encroached to the point where few streambelt possibilities exist.

However, there are parts of the County where there is evidence of irretrievable destruction of streambelts. The expected population growth and resultant urbanization will greatly increase the hazard of uncontrolled development in these areas if action to protect them is postponed.

The components of streambelts are:

1. Critical components

   a. The watercourse of a defined stream including banks, bed, and water.

   b. Lands subject to stream overflow.

   c. Associated wetlands.

   d. Shorelines of lakes and ponds associated with the stream.

   e. Areas in proximity of streams where certain developments or land uses probably would have adverse environmental effects, i.e., pollution and health hazards, erosion and sedimentation, destruction of ecological systems.

2. Optional components

   a. Contiguous lands with special environmental values, i.e., wildlife habitat, aesthetic, public recreation, scenic, historic, etc.

   b. Potential water development sites of public significance.

   c. Other areas necessary as links to form a continuous streambelt system.

Considerations Involved in Streambelt Delineation

The Prince William Soil and Water Conservation District can provide guidance to the County Board of Supervisors, the Planning Department, the Public Works Department, the Health Department and Parks and Recreation Department or to the incorporated towns in the County and help them compile inventory data needed for the development of streambelt systems that fulfill their stated goals. When delineating a streambelt system, some of the items needing consideration are:

Floodplain studies: The streambelt system should include provisions for floodplain management compatible with flood hazards. For some areas, particularly along the rivers and larger streams, this will require floodplain studies such as are made by the U. S. Soil Conservation Service, the U. S. Army Corps of Engineers, and the U. S. Geological Survey.

Open space plans: Open space and recreation needs based on expected population concentrations.

Reservoir site studies: The identification of water impoundment sites for future development for purposes such as recreation, fish and wildlife control, floodwater storage, water supply, fire protection, sediment control, etc.

Favorable groundwater storage areas (aquifers): From information derived from maps and data produced by the U. S. Geological Survey.

Historic, scientific, and scenic features: Location, identification and evaluation of historic, scientific, and scenic features, especially those in proximity to streams. This should also include features of geological or archeological nature.

Wildlife habitat studies: Inventory and evaluation of various kinds of wildlife habitat. Special consideration is required for locally endangered species.

Critical erosion areas: Identification of areas of accelerated erosion, especially those contributing to the siltation of wetlands and the sediment load of streams and reservoirs.

Stream water quality inventory: Identification and evaluation of stream water quality according to water quality standards adopted by the State of Virginia.

Areas with good potential for sand or gravel: Derived from information provided by the U. S. Geological Survey, and Soil Conservation Service.

Land use inventory: Identification of the important land uses in areas near streams. Locations of gravel pits, quarries, or other types of extraction operations are of special significance.

Soil survey: Detailed soil maps (of the National Cooperative Soil Survey) will supply much of the data needed to delineate the streambelt corridors. Likewise, soil characteristics should be a major consideration in determining appropriate use and preservation of these natural resources.

Planning a Streambelt System

In the interest of public health, safety, and welfare, a streamblet system is intended to conserve natural resources of vital significance, permitting and encouraging the wise use of these resources. Most of the items listed under Considerations Involved in Streambelt Delineation are helpful in planning streambelt systems. In advancing these principles, the specific intents are:

1. To promote such developments or land uses that would not have probably adverse environmental effects.

2. To promote the health, safety, and welfare of residents and property owners near streams and in areas subject to flooding, and to prevent further occupancy in floodprone areas.

3. To maintain natural drainage courses sufficient to carry abnormal flows of storm water in periods of heavy precipitation and prevent the future need of excessive public expenditures for water disposal, and to reduce the need for costly flood prevention measures by retention of floodplains and floodprone areas in open space.

4. To maintain a framework of environmental corridors of high quality for public access with close proximity to neighborhood and population centers.

5. To help stabilize stream flow.

6. To protect water quality.

7. To retain sites for beneficial water uses such as flood control, water supply, wildlife habitat, and recreation.

8. To protect areas of importance to the preservation of significant ecological systems.

9. To maintain and encourage the improvement of environmental qualities including beauty, recreational opportunity, plant and animal life, scenic and other natural values.

10. To preserve areas of unique, scientific, or historic interest and to retain areas with special significance for scientific study, ecological research, and conservation or nature education.

11. To retain contrast in the landscape and provide buffer zones between incompatible land uses.

12. To protect and improve fish and wildlife habitats.

13. To help protect groundwater areas that are important to water supply.

Land Use Determinations

The planning process requires choosing between various possible land uses for each part of a streambelt system.

In many instances, multiple use of the same land area is possible. Soil and water conservation districts can assist in this process by providing information about feasible land uses, based on soil characteristics, to individual land users and units of government.

1. Land Uses Compatible with Soil Characteristics

   a. In all areas of the streambelt:

      (1) Wildlife preserves, preservation of scenic, historic, natural, and scientific areas and nature study.

      (2) Forestry and wildlife habitat.

   b. In addition to those stated in "a" above, other uses and operations are compatible in the level to moderately steep well drained and moderately well drained soils as follows:

      Agricultural activities including plant nurseries, cropland, hayland, and livestock pasture (with livestock watering devices) provided erosion and pollution are controlled.

      Outdoor recreation uses such as parks, playgrounds, campsites, golf courses, hunting areas, and trails.

      Uses that maintain permanent vegetation cover including extensive recreation.

      On the steeper land (over 15%), with deep soils, uses that maintain permanent vegetative cover including extensive recreation are compatible.

2. Conditional Land Uses Based on Soil Characteristics

   The following land uses will require regulation and the application of a sound conservation plan to avoid undue deterioration of the streambelt.

   a. In all areas of the streambelt:

      (1) Highways, roads, utility transmission and pipe lines, dams, bridges, mining, quarrying, earth removal, and dredging.

      (2) Small recreational buildings, boat docks, ramps, etc. (These will be subject to state statutory provisions, local ordinances, and the environmental review procedures.)

   b. In addition to those stated in "a" above, certain other uses are conditional in the following areas:

      Poorly and very poorly drained soils, embankment, dugout, and bypass ponds for irrigation, recreation, wildlife, etc., level ditching, and other wetland wildlife improvements. (These uses are conditional on conservation plans and engineering designs provided or approved by the soil conservation district or other state resource agencies.)

3. Restricted Land Uses Based on Soil Characteristics

   The following land uses generally are not compatible with the objectives of a streambelt system.

   a. In all areas of the streambelt:

      (1) Residential, commercial, industrial, and institutional buildings.

      (2) On-site sewage disposal.

      (3) Any solid or liquid waste or refuse disposal including sanitary landfills.

      (4) Junk yards, commercial and industrial storage.

      (5) Barns, stables, feedlots, barnyards, dry lots, poultry buildings, and farm waste disposal.

(6) Access to watercourses by domestic livestock.

b. In addition to those uses stated in "a" above, certain other uses are restricted:

Poorly and very poorly drained soils: cropland, hayland, and pasture and drainage and land filling.

Planning is an open ended process that proceeds at more than one level of detail over an extended period of time, with enough flexibility in the plan to take advantage of unforeseen opportunities and to accommodate other contingencies.

Soil Survey Criteria for Streambelt Delineation

The following approach utilizes standard soil surveys in the process of streambelt designation and setting forth appropriate uses of these natural resources. The actual delineations on a map would be based on the soil boundaries shown on detailed soil survey maps.

Areas in proximity to named streams and their tributaries shown on USGS topographical maps and consisting of the soils as specified in the following groupings will be included in the streambelts. The watercourses consist of the beds, banks, and water of the named streams and their tributaries.

Excessively drained terrace soils and well drained terrace soils with slopes less than 15 percent:

Shall include the areas of these soils that because of proximity to the watercourses, the soil patterns, steepness of slope, or surface water drainage require controlled land use to minimize the hazard of pollution, erosion and sedimentation. As a minimum, the streambelt zone shall include these soils that are less than 150 feet from any of the following: the watercourse, its floodplain, or poorly or very poorly drained soils contiguous to the watercourse or its floodplain. Also, it shall include areas of these soils that are within 50 feet of a terrace excarpment that is within the streambelt.

Terrace excarpment :

Shall include terrace escarpments adjacent to either the watercourse or its floodplain, or poorly drained or very poorly drained soils contiguous to the watercourse or its floodplain.

Moderately well drained soils of the terraces:

Shall include areas of these soils contiguous to the watercourse or its floodplain, or poorly or very poorly drained soils contiguous to the watercourse or its floodplain.

Poorly and very poorly drained terrace soils:

Shall include these soils where they are contiguous to either the watercourse or its floodplain.

Well drained upland soils with slopes less than 15 percent:

Sufficient areas of these soils shall be included to provide suitable width and continuity for a streambelt to meet public objectives. As a minimum, the streambelt shall include these soils less than 150 feet from any of the following: the watercourse, its floodplain, or poorly or very poorly drained soils contiguous to the watercourse or its floodplain.

Well drained upland soils with slopes more than 15 percent:

Shall include the areas of these soils that because of proximity to the watercourse, the soil patterns, or surface water drainage require controlled land use to minimize the hazard of pollution or erosion and sedimentation. As a minimum, the streambelts shall include areas of these soils that are contiguous to the watercourse or its floodplain, and which are within 200 feet of the watercourse, its floodplain or poorly drained or very poorly drained soils contiguous to the watercourse or its floodplain.

Moderately well drained upland soils:

Shall include sufficient areas of these soils to provide suitable width and continuity for a streambelt to meet public objectives. As a minimum, the streambelt shall include these soils that are less than 150 feet from any of the following: the watercourse, its floodplain, or poorly or very poorly drained soils contiguous to the watercourse or its floodplain.

Rocky and very rocky upland soils with slopes less than 15 percent:

Shall include areas of these soils where proximity to the watercourse, soil patterns, or surface water drainage require controlled land use to minimize the hazard of pollution or erosion and sedimentation. As a minimum, it shall include these soils which are contiguous to the watercourse or its floodplain and which are within 200 feet of the watercourse, its floodplain, or poorly or very poorly drained soils contiguous to the watercourse or its floodplain.

Rocky and very rocky upland soils with slopes more than 15 percent, and extremely rocky soils:

Shall include areas of these soils where proximity to the watercourse and soil pattern or surface water drainage require controlled land use to minimize the hazard of pollution or erosion and sedimentation.

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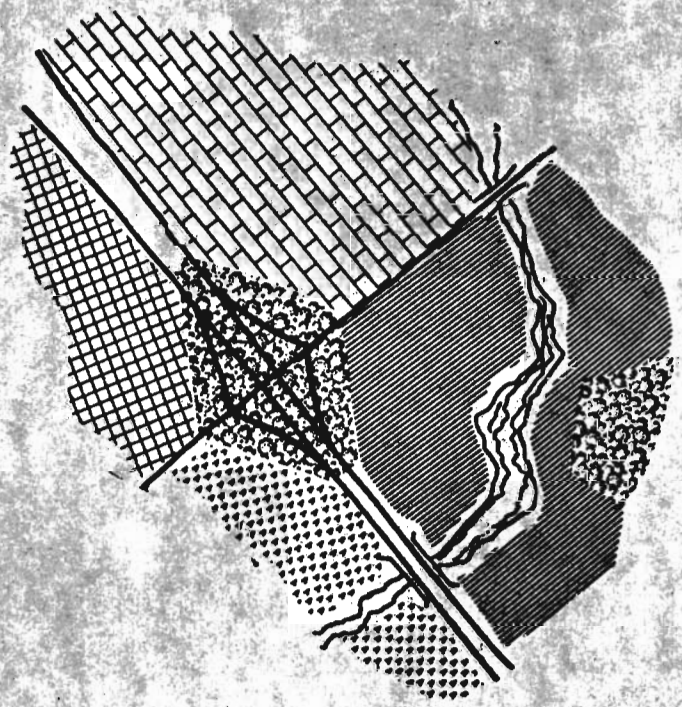
COMPREHENSIVE PLAN FOR PRINCE WILLIAM COUNTY, VIRGINIA



SECTION II WHERE ARE WE GOING?

Part C

THE LAND USE PLAN 1974-1980

Adopted November 1974

PRINCE WILLIAM COUNTY PLANNING OFFICE

Board of County Supervisors

Charles J. Colgan, Chairman

Donald W. Turner, Vice-Chairman

Vernon D. Dawson

Roy W. Doggett

Andrew J. Donnelly

Ralph A. Mauller

C. Scott Winfield

Planning Commission

L. J. Dukes, Chairman

William J. Tucker, Vice-Chairman

Doyle C. Davis

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John W. Johnson

John M. Piercy, Jr.

Chris D. Thomaidis

A part of the comprehensive plan for the physical development within the jurisdiction of Prince William County, pursuant to the provisions of Title 15.1, Chapter 11, Article 4, the laws of the Commonwealth of Virginia.

Prince William County Planning Office
Garfield Administration Building
15920 Jefferson Davis Highway
Woodbridge, Virginia 22191

PRINCE WILLIAM COUNTY

BOARD OF COUNTY SUPERVISORS

9250 LEE AVENUE
MANASSAS, VIRGINIA
PHONE: (703) 368-9171

The Citizens of Prince William County

Ladies and Gentlemen:

It is our pleasure to present herewith the Land Use Plan 1974-1980 for Prince William County, adopted by the Board of County Supervisors' Resolution #75-14-24 of November 12, 1974.

This plan is an integral portion of the Comprehensive Plan for the physical development of Prince William County. It identifies land use planning objectives and policies for the period from 1974 to 1980. The plan is general in scope and is intended to be a guide for the orderly development of the County.

Several public hearings were held on this plan by the Planning Commission and the Board of County Supervisors. The interest and assistance of County citizens have been beneficial to the development of this adopted version. While the plan will be modified periodically, it is hoped that it will serve as a basis for the County's development. As such, it should be of considerable assistance in building a finer County.

Respectfully presented,

Charles J. Colgan, Chairman
Prince William County Board of Supervisors

HGB/sah

PRINCE WILLIAM COUNTY
LAND USE PLAN 1974 -1980

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THE LAND USE PLAN

Introduction

The Commonwealth of Virginia provides that a Comprehensive Plan for a local jurisdiction may consist of various elements, which, when taken together, form the plan.

This document and accompanying maps represent the Land Use Plan portion of the Comprehensive Plan.

The other elements of the Prince William County Comprehensive Plan include a background document entitled Where Are We Now, as well as the Transportation Plan, the Sewer and Water Facilities Plan, the Environmental Management Plan, the Housing Plan, the Economic Development Plan, and the Community Facilities Plan.

1 Other Elements Of The Plan

WHERE ARE WE NOW?

This document is a summary of existing conditions in Prince William that are relevant to comprehensive planning. The document considers the natural features of the County, population characteristics, economic conditions, and the status of the housing stock. Also described are the existing major transportation facilities, the sewer treatment plants, current water sources, and various other community facilities. The existing zoning is presented in tabular form and existing land use is presented graphically. (See Plate 1).

THE TRANSPORTATION PLAN

The Transportation Plan is concerned with all facets of transportation planning in the County. It includes recommendations and policies for highway planning, mass transit planning and air transportation. Because of the general nature of this plan, when discussing highway improvements, only expressways, interchanges, and arterials are identified. The highway section is divided into three parts. First, the Plan enumerates first priority improvements currently needed to correct existing highway problems. The second priority improvements are either improvements to existing facilities or new roads needed during the next few years. The highway section also includes a section on third priority improvements and alternatives. These roads are outlined to ensure that the County's future transportation needs will be adequately planned and achieved. Because of the complexity of locating and building an outer beltway, the Transportation Plan also has a section on the proposed Outer Beltway and its impact on Prince William County.

The Transportation Plan outlines the lack of mass transit facilities for Prince William County residents. Particularly needed are mass transit facilities for County residents who commute to Washington and Northern Virginia to work.

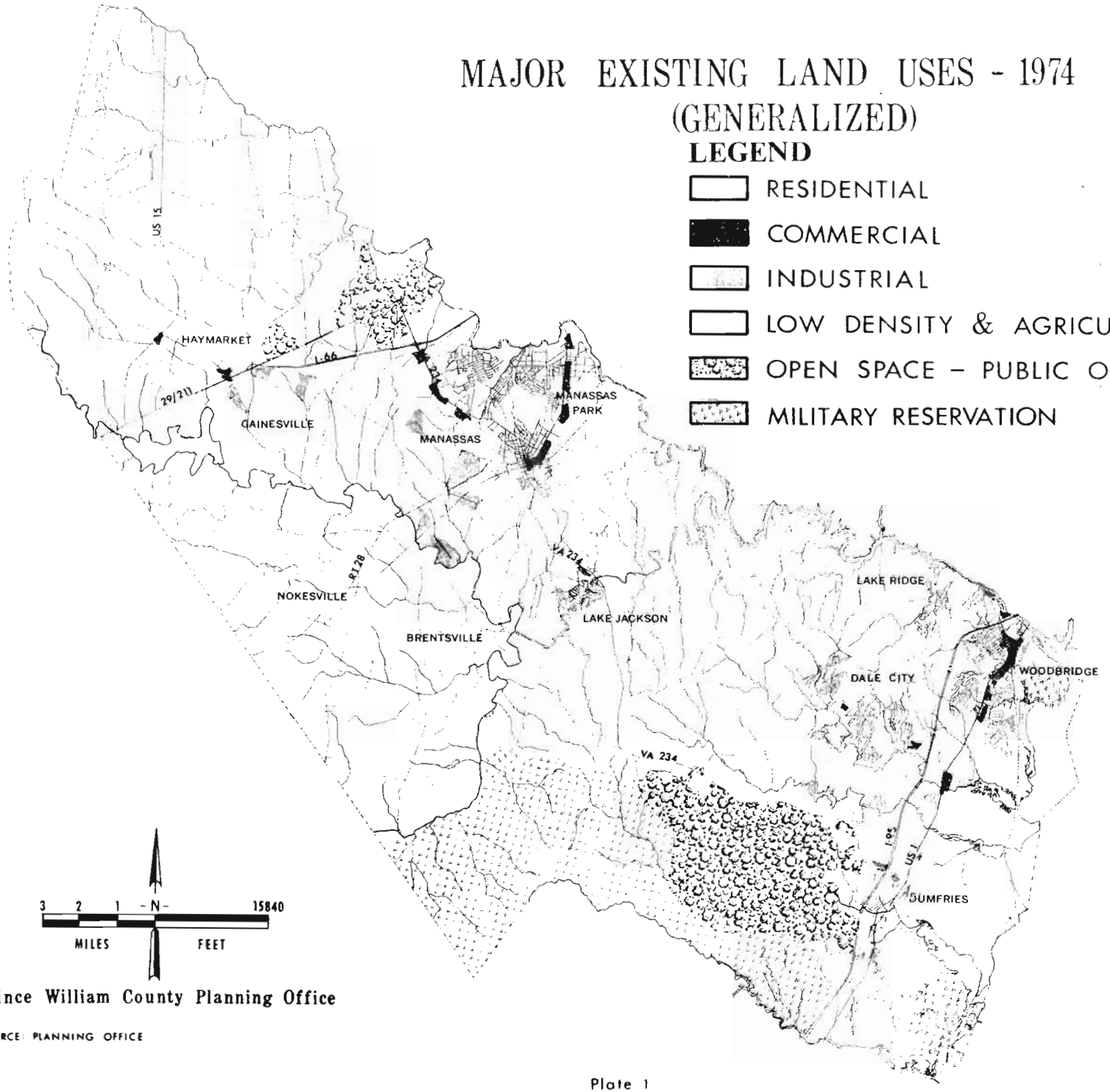
The Transportation Plan's section on Air Transportation briefly outlines the need for careful coordination of land use planning around the County's two general aviation airports. As the airports expand, the Transportation Plan states that "future development around the airport should be planned and controlled by Prince William County to assure that the land uses remain compatible with present and future airport operations".

THE SEWER AND WATER FACILITIES PLAN

The Sewer and Water Facilities Plan first outlines the existing sewer and water problems in the County and recommended courses of action to ameliorate these problems. The Sewer and Water Facilities Plan points out that the provision of sewer and water systems is a prerequisite for development at suburban densities. Because of this fact, the Sewer and Water Facilities Plan outlines the existing sewage capacity of the existing sewage treatment plants in the County as well as enumerating proposed expansions of these plants. The Plan outlines the time frame of these plant expansions and analyzes them in the context of site plans currently submitted to the County. Based on the data as well as other considerations, the Plan recommends areas of the County to be served by sewer service during the 1974-1979 period. The Sewer and Water Facilities Plan also recommends that the County continue to implement its Sewage Allocation Policy. Adopted in late 1973, this policy ensures that commercial, industrial and other employment uses will have sewage capacity available and that development requiring sewer capacity will be treated on a first come, first served basis.

Besides analyzing additional sewage capacity, the Sewer and Water Facilities Plan examines present water consumption in the County and enumerates the need for additional water sources for the County. The Plan outlines a program for the County to undertake to ensure both a short range and a long range water supply.

MAJOR EXISTING LAND USES - 1974
(GENERALIZED)



Prince William County Planning Office

SOURCE: PLANNING OFFICE

Plate 1

ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan states that the most pressing environmental problems facing the County are largely associated with the extremely rapid population growth experienced since 1950. The population in 1950 was 22,612. In 1970, the population was 111,102. As a result of this rapid growth, with its extensive conversion of land to suburban uses, a number of environmental concerns have become manifest.

The Environmental Management Plan outlines the environmental problems in the County and the recommended actions needed to rectify them. These problems include flooding, erosion and siltation, air quality, wetlands, solid waste, tree preservation and visual blight. The Plan also includes a section on the need for historic and village preservation within the County. The Environmental Management Plan focuses on two main elements -- the identification of areas of the County which are particularly sensitive to development (Critical Environmental Areas) and the adoption of policies designed to protect both these sensitive areas in particular and the County-wide environment in general.

ECONOMIC DEVELOPMENT AND COMMUNITY FACILITIES PLAN

The Economic Development Plan will make clear that the County is in competition with every other political subdivision in the Metropolitan Area for new employment. Because Prince William County has been referred to as a "bedroom community" this plan will recommend a number of guide lines which should be implemented to encourage industrial development and employment uses in the County. The Plan will point out that adequate access to transportation facilities is needed for all employment areas.

The Economic Development Plan will also examine the fiscal position of Prince William County and the implications of the present imbalance of revenue sources. The plan will briefly examine alternative strategies to enhance the County's fiscal position in the future.

The Community Facilities Plan will describe the placement and phasing of public facilities over the next five year period. The Community Facilities Plan is needed to ensure that public facilities will be well-located and phased to the growing needs of the County. This Plan is needed so that the facilities are planned in scale with population densities and so that these facilities complement the Land Use Plan. A major step toward better coordination of public facility placement and phasing has been established with the development of the County's Capital Improvement Program. A Capital Improvement Program allows local public agencies to coordinate their efforts in alleviating inadequacies and shortages in public facilities over a six year period.

The Planning Staff believes that it is the intent of the Board of County Supervisors that the relationship between the Capital Improvements Program and the County's comprehensive plan become more explicit and that it be expressed in summarized form as an integral part of the capital program. The current Capital Improvements Program recommends that in order to achieve this relationship, future capital programs should relate specifically to the information contained in the Prince William County Comprehensive Plan.

THE HOUSING PLAN

The Housing Plan outlines some of the housing problems affecting Prince William County. These include the high costs of housing, the "ineffective" demand present in Prince William County, the financial constraints, the diversity in the housing stock, the problems with Automatic Homeowners Associations, tenant-landlord relations, and mobile homes.

The Housing Plan lists the various housing programs of all levels of government which will aid Prince William County residents. The Housing Plan also examines the housing activities of other regional and state agencies and their efforts in Prince William County.

2 Growth In Perspective

Prince William's tremendous growth over the last twenty years has provided thousands of people with homes and created great opportunities for business activity. But, with these positive benefits have come problems as well.

Many of the most urbanized areas are deficient in public services such as schools, parks and recreation. Nor have a sufficient number of jobs been created in the County.

A lag between the arrival of new families and the provision of public services is common to many rapidly growing communities. If the tax base is sufficient and if the community's growth is balanced between new residences, commerce and industry, then the lag merely represents the time necessary for the locality to provide services after development has taken place.

However, if the rate of growth is too fast, the local government simply may not be able to keep up. Or the growth may be such that the tax base does not keep up with the financial demands for public facilities and services.

Both of these problems have confronted Prince William. The rate of land conversion from rural to suburban uses has been phenomenal, and the pattern of new uses has not been balanced.

The County has developed as a classic bedroom community basically dependent upon employment in Washington and nearby areas. Such a pattern of development can only be maintained, from a fiscal point of view, if the new residents are of very high income and, consequently, tend to live in very high value homes.

Prince William is not a community where the average income is extremely high such as is the case in Fairfax and Montgomery Counties. As a consequence of the predominantly residential pattern of development, the average income of the residents, and the extraordinary pace of new development, the County's fiscal resources have been severely strained.

As of the spring of 1974, the fiscal position of the County is of great concern with every appearance of becoming even more important over the next few years. Consequently, any land use plan which necessarily deals with the character, location, and timing of growth must consider as fundamental the question -- What can the County afford?

THE RISING COST OF PUBLIC SERVICES

The operating costs of the County have risen dramatically over the last decade. The operating cost (minus debt repayment) has risen from $6.3 million in 1964 to $40 million by 1973. Over the last five years, the annual increase has averaged $4.8 million per year, or an average of 20.57% per year.

On a per capita basis, the operating expenditures have risen from $160 per person in 1968 to $280 in 1973 indicating that population growth per se is not the only factor which has increased the budget. While inflation is of course a factor, changes have occurred in state and federal aid, new requirements have been imposed, and increasing demands for better public services have required expanded or new programs.

THE COMMUNITY FACILITIES CRUNCH

While operating costs have soared, the County has gone further and further into debt as necessary public facilities have been provided.

1. Increase in Demand for Public Facilities - Between fiscal years 1964 and 1973, the County spent $81,695,670 on the construction of public facilities. This figure does not include monies spent on sewer and water projects which are to be repaid by the sanitary districts.

Of the $81.7 million spent, $75.8 million was financed with general obligation bonds with the remainder coming from the general and school operating funds. Of the total, 81% went for schools, 12% for hospitals, about 5% for general government projects, 2% for parks and less than 1% for libraries.

2. Causes of Increase - The reasons for this rising demand may be summarized as:

Increasing population requires new facilities.
New population demands more and higher quality services.
Higher standards require higher spending per facility.
Facility replacement is required.
Inflation causes increased costs.

There is an inter-relationship between the first two of these. As a locality changes in character from a rural, low density community to a suburban character, new services are instituted. Would money be spent for libraries, hospitals and parks in a rural locality with an essentially static population? Undoubtedly, increasing population is the primary stimulus for a demand for such facilities and services, but changing public attitudes have increased the demand even in rural communities.

The rising standards for public facilities clearly cause higher costs per new facility. Examples include lower pupil/teacher ratios, resulting in more classrooms to serve the same number of students, larger kitchens in elementary schools, more extensive parking lots for high schools as more students drive, extensive athletic facilities, and so on. Many of these changes are statewide and are independent of growth in a given locality.

Facility replacement and inflation, of course, are common factors in all communities.

3. Effects of Rising Demand - Since the large capital expenditures made by Prince William could not be on a "pay as you go basis", they consequently were financed through general obligation bonds. The County's debt structure is fundamental to an examination of the problem.

In 1964, the debt of the County, including sanitary districts, totalled 18.1 million dollars. By 1973, the debt had risen to 88.4 million.

By law, sanitary districts are limited to an indebtedness of 18% of the assessed value. While Counties are not so limited, as a County's debt ratio increases to or above 18%, its bonds become more and more difficult to market.

However, this ratio may be deceiving as an indicator of a government fiscal position since reassessments are not carried out annually. Therefore, the ratio increases between reassessments to apparently perilous levels and then drops dramatically after the reassessment.

For example, the County's ratio was an apparent 32% in 1971 which then dropped to 18% after the reassessment became effective. By 1973, the ratio had risen to over 19%. This has resulted in a new County-wide reassessment to take place in 1974.

4. Per Capita Debt - Another measure of fiscal position is a locality's per capita debt, which is independent of the assessment cycle.

In fiscal 1964, the County owed $262 per person. Over the next ten years, the debt rose to $619 per person. This figure is important because it indicates that even with the repayment of millions of dollars over the decade, and the constantly expanding tax base as growth continued, the County has more than doubled its obligation per person.

Obviously, this upward trend cannot continue indefinitely. As a practical matter, the County's ability to sell new bonds will be seriously impaired if the debt per capita continues to rise towards $1,000 per person.

RISING TAXES

As could be expected from the foregoing, County taxes have risen considerably over the decade. The actual Real Property Tax* has risen from $.61 per $100 of appraised value in 1964, to $1.52 per $100 in 1973. Other County taxes have also increased during this period.

While taxes have risen dramatically in Prince William, the County residents are still relatively subject to less of a burden than most of the local jurisdictions in the Washington area.

Prince William's Real Property tax is less than any other urbanized jurisdiction in the area except Arlington County which is slightly less. When all local and state taxes are combined, Prince William ranks sixth in the area. Prince Georges, Montgomery, and Fairfax Counties as well as Fairfax City and Alexandria all have a higher tax burden for a family of the same income, than does Prince William.

* The actual tax is the assessed value ratio times the tax rate. The current ratio is 33% and the rate $4.60. Therefore, .33 × 4.60 = $1.52 is the actual tax. Thus, if a house were appraised at $40,000, the actual tax bill would be $1.52 for every $100 of appraised value or approximately $608.

EXISTING ZONES (not including towns)

There is a vast amount of land in Prince William that has been zoned for suburban uses that has not yet been developed. Excluding the incorporated towns and rural subdivisions, there is zoning for an estimated 60,618 additional housing units or approximately 220,000 people. These figures do not include any development on land zoned A-1, Agricultural. (See Appendix)

By far, the greatest number of potential units is in the eastern portion of the County with nearly 55,000 units. The greater Manassas area, excluding the towns, has zoning for an additional 5700 units.

The distribution by unit type is shown below.

Zoning by Estimated Number of Units
Eastern and Western Urbanized Areas
(Incorporated Towns not Included)

	East	West	Total
Single Family	10,998	442	11,440
Townhouse	13,175	2,690	15,865
Apartments	30,578	2,600	33,173
Mobile Homes	135	0	135
	54,886	5,732	60,618

Source: Prince William County Planning Office

Zoning for apartments is by far the largest category - over twice the number of either single family or townhouses. There are probably several reasons for the predominance of apartment zoning, including the increased value of the land when zoned for high density use and consequently the appeal of such zoning for land speculators. Additionally, as a locality becomes more suburban in character and land values rise, the most advantageous economic return tends to be in the development of new units at higher than single family density.

However, regardless of the reasons, the high number of potential townhouses and apartments is consistent with a trend towards these units as single family home prices rise beyond the means of many families. Many of the new apartments will probably be developed and marketed as condominiums.

SITE PLANS SUBMITTED ON ZONED LAND

Of the total potential units shown above, more than half have already been shown on site plans submitted to the County.

Estimated Units Zoned Only and Units Shown on Site Plans
(Urbanized areas, towns excluded)

	Units Shown on Site Plans	Units Zoned Only	Total
East			
Single Family	7,420	3,578	10,998
Townhouse	9,634	3,541	13,175
Apartment	12,802	17,776	30,578
Mobile Home	135	0	135
Sub-Total	29,991	24,895	54,886
West			
Single Family	224	218	442
Townhouse	2,120	570	2,690
Apartment	1,970	630	2,600
Mobile Home	0	0	0
Sub-Total	4,314	1,418	5,732
TOTAL	34,305	26,313	60,618

Source: Prince William County Planning Office

As shown above, over 34,000 units have already appeared on site plans, allowing for an estimated 122,000 new residents at an average family size of 3.6 persons per unit. If an average family size of 3.0 persons per unit is used, these 34,000 dwellings will produce a population of 102,000 persons.

HOUSING AND POPULATION PROJECTIONS

Population estimates and projections published by the Planning Office indicate that by July 1, 1974, the County's population will be approximately 150,000 people overall, an average increase of about 10,000 people a year since 1970. Projections based on past trends are shown below. These were developed by the Planning Office in early 1974. They reflect a steady increase in population and a slight drop in the rate of growth.

Population 1970 - 1980

Year	Average Family Size	Total Population
April 1970	3.85	111,102
July 1971	3.83	120,022
" 1972	3.80	132,337
" 1973	3.76	142,797
" 1974	3.72	152,320
" 1975	3.68	161,607
" 1976	3.64	170,657
" 1977	3.61	169,955
" 1978	3.58	189,111
" 1979	3.55	198,057
" 1980	3.52	206,826

Source: Prince William County Planning Office

As can be seen, it was estimated that between 1974 and 1980, 54,506 new residents will be added to the County's population -- or an average of about 9100 persons per year.

In terms of housing units, the growth would be as shown below:

Housing Units, 1970 - 1980

Year	Total Housing
1970	29,885
1971	32,612
1972	36,358
1973	39,740
1974	42,923
1975	46,106
1976	49,289
1977	52,472
1978	55,665
1979	58,848
1980	62,031

Source: Prince William County Planning Office.

As shown above, approximately 3200 units per year would be added between 1974 and 1980.

The Washington Metropolitan area is projected by the Council of Governments to grow by approximately 39,000 units a year from 1974 to 1980. Over the last few years, Prince William has received an average 9.78% of the new housing units built in the Washington area as shown below:

Year	Washington Area Residential Building Permits	Prince William Residential Building Permits	Percentage
1969	25,515	2,595	10.17
1970	27,688	2,683	9.69
1971	37,722	4,145	10.99
1972	44,218	3,711	8.53
1973	37,402	3,566	9.53

Source: Prince William County Planning Office

If the average share of 9.78% is used, and the projected increase of 39,000 units for the area is correct, then Prince William would grow by 3814 units per year, somewhat higher than the 3200 units projected from local past trends, as indicated above.

Since there are only a fixed number of new residents seeking housing in the Washington area, then for Prince William to grow at a rate above its past percentage, the County would have to "capture" a greater portion of the total market. There does exist the possibility that, if Prince William County provides for a great deal of growth while other jurisdictions limit growth, the County may well grow faster than anybody has thus far predicted.

GROWTH IN RURAL PRINCE WILLIAM

One indicator of residential growth in rural areas is the number of permits issued for individual septic systems. The chart below details recent trends.

Individual Sewage Disposal Activity

Activity	FY 69-70	FY 70-71	FY 71-72	FY 72-73	7/1/73 - 12/31/73	TOTAL
Permits Issued	153	354	333	740	710	2,290
Permits Denied	5	56	162	161	112	496
Individual Sewage Systems Installed	149	286	254	218	311	1,218

Source: Prince William County Health Department

The key figure above is the number of systems actually installed. It should be noted that in a six month period in 1973, more systems were installed than in any previous year. This increased activity may well reflect the recent lack of sewer capacity in the urbanizing areas of the County.

If the current increased annual rate of 600 units per year were to continue at this level, then some 3,000 units would be added by 1980 in the rural portions of the County.

PROJECTED GROWTH BASED UPON CONTINUATION OF RECENT GROWTH

Based on the preceding data, it is projected that Prince William County's housing stock will increase by an average of about 4000 units per year during the next six year period. It is assumed that approximately 600 of these units per year will be added in rural areas with the remaining 3400 being distributed between the eastern and western urbanized areas of the County. It is estimated that about 69% of the urban units will be built in the east and that 31% will be in the Manassas area.

It may be useful at this point to compare the number of units on site plans submitted and the projected annual growth of urban units. There are 34,000 units shown on site plans. If the projected growth of 3,400 urban units per year is correct, it will take 10 years just to build out the units that now appear on site plans, given the continuation of recent growth trends.

THE SEWER CONSTRAINT

Given the tremendous number of potential units based on zoning and assuming that an average of only 3400 units a year will actually be built in the urban areas over the next six years, the projected location of new units must consider other constraints.

The Sewer Allocation Policy adopted by the Prince William Board of County Supervisors provides sewage treatment capacity based on the date of submission of development plans. Assuming then, that construction of new housing units would take place in the order in which development plans have already been submitted, the result would be as shown in dark brown on Plate 2 - Projected Residential Growth at Suburban Density.

The dark brown area represents an average of 3400 new units a year from 1974 to 1980, or a total of 20,400 units. Of the total, 13,400 were allocated to the east and the remaining 6000 were projected in the west. No new zoning was necessary to realize this allocation. All of the units on site plans were allocated in the Manassas area, as well as all units for which zoning is present.

The Sewer Allocation Policy also specifies that 20% of all new sewer treatment capacity will be reserved for commercial, industrial and public uses. This policy applies only to public systems. Dale Service Corporation, a private system, is not covered. This amount of sewer capacity was not allocated to residential uses, consistent with the policy.

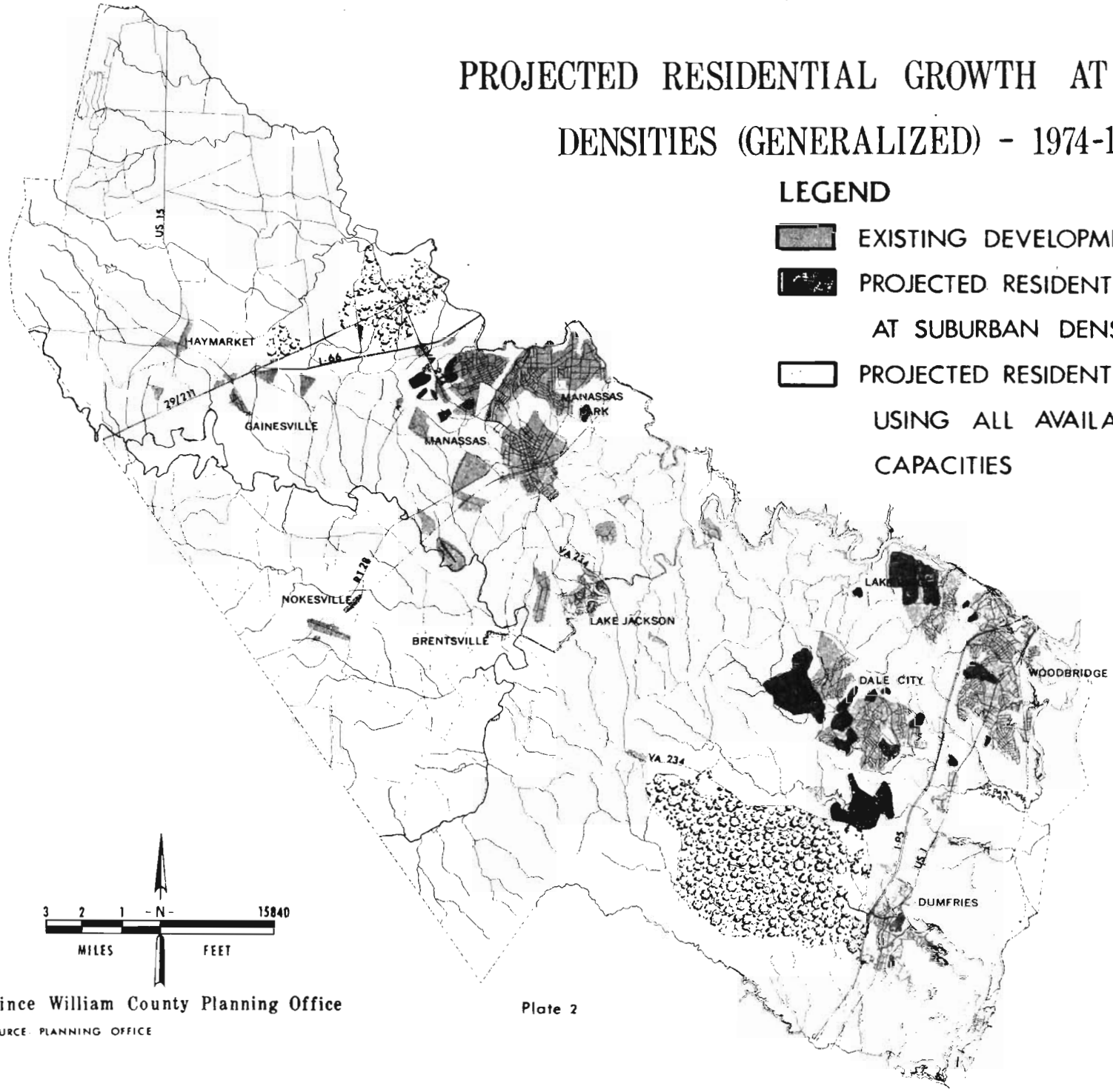
This Sewage Allocation Policy has been followed in evaluating whether sufficient sewage treatment capacity would be available for the trend projection of 20,000 units. The distribution shown demonstrates that, assuming interim expansions of current treatment plants occur as anticipated and that the two regional treatment plants open near the scheduled dates (1976 and 1978), sewer will not be a constraint for the overall number of projected units.

The light brown on Plate 2 represents several additional considerations. If growth should exceed the trend projection, and if the Sewer Allocation Policy is followed, residential development would follow the course as shown by the combined light and dark brown areas.

As can be seen, no light brown is shown in the Manassas area since the first projection absorbed all site plans submitted to date. It is possible, however, that if the UOSA plant is allowed to expand after initial succesful operation, that additional capacity for more residential units could be available.

In the Dale City Service area, the light brown represents only the site plans submitted and does not reflect all sewer capacity anticipated to be available in the six year period, so that more growth than shown is possible.

PROJECTED RESIDENTIAL GROWTH AT SUBURBAN DENSITIES (GENERALIZED) - 1974-1980

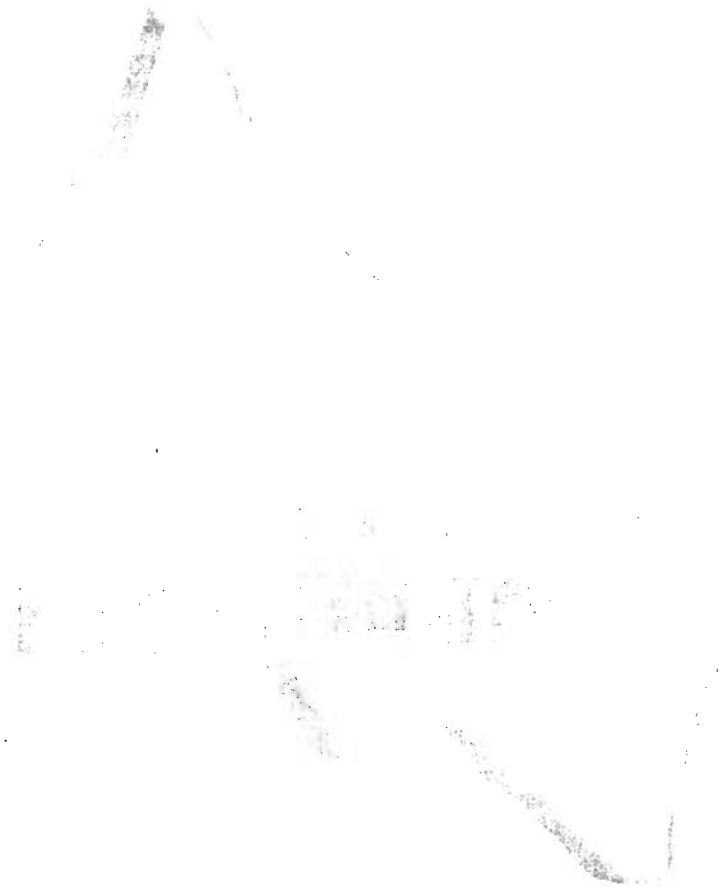


Prince William County Planning Office

SOURCE: PLANNING OFFICE

Plate 2

In the remainder of the eastern portion of the County, the light brown represents all of the sewer capacity to be available from the 12 million gallon per day capacity Potomac Plant, after 20% of the new capacity has been reserved. Although the order of site plans has been used for this projection, the light brown also reflects legal commitments made by the Board of County Supervisors to the developers of Lake Ridge, Country Club Lake, Rippon Landing and the Elrod tract. These developers alone could possibly use up all interim capacity through 1978, if the market opened up and if they could gear up their production schedules. Only if growth exceeds the trend projection will sewer be a constraint to growth. It should be noted here that the Potomac Plant will not have sufficient capacity to handle all site plans now submitted.



3 The Land Use Plan

OBJECTIVES

1. General Land Use Objectives

   a. Provide for orderly growth along desired lines of development.

   b. Create areas of concentrated activity in appropriate locations instead of suburban sprawl.

   c. Preserve areas for agriculture or very low density residential uses in appropriate locations where dense development is not desired.

   d. Achieve balanced growth consistent with the County's social and economic needs and resources.

   e. Establish a land development process that reflects good planning, prevents uncontrolled development, provides for public participation and is economically and environmentally sound.

2. Land Use Objectives Relating to Sewer and Water

   a. Provide adequate, safe, efficient, and economically feasible public sewer and water systems in all presently developed areas.

   b. Minimize environmental damage resulting from inadequate waste disposal facilities through the coordination of community growth and sewage facility expansion.

   c. Utilize water and sewer facilities as a tool for shaping the direction, extent and timing of urban development.

   d. Utilize water and sewer facilities as a tool for encouraging balanced growth, especially industrial, commercial and employment uses.

3. Land Use Objectives Relating to Transportation

   a. Provide mass transit services to County residents.

   b. Provide adequate access to all areas at a level of service appropriate for the needs of each area.

   c. Stage the development of the transportation system to complement the planned overall development of the County.

   d. Provide for improvement of existing deficiencies before creating facilities primarily intended to serve future development.

   e. Design highways that minimize the destructive physical impact on the environment and to provide the best possible opportunity for compatible development.

4. Land Use Objectives Relating to Economic Development

   a. Improve the County's tax base through development of industrial, commercial and employment activities.

   b. Provide for the timely development of well located and appropriate commercial and industrial enterprises.

   c. Provide attractive and convenient facilities for the sale of goods and services to the residential population and to travellers passing through the County.

5. Land Use Objectives Relating to Community Facilities

a. Provide community facilities in those areas of the County where they are needed or where growth is planned to take place.

b. Prevent growth that will overburden the capacity of existing or planned community facilities.

c. Seek methods for requiring new development to participate in the provisions of community facilities required to serve that development.

6. Land Use Objectives Relating to Environmental Management

a. Protect critical environmental areas.

b. Protect historic sites.

c. Preserve the rural character of the County in areas not planned for immediate development.

d. Preserve the unique village environments of the small towns in the County.

e. Channel growth into areas which may be developed with minimum environmental damage.

f. Regulate the development process to minimize environmental damage.

7. Land Use Objectives Relating to Housing

a. Permit residential growth within the County's ability to provide services to all residents.

b. Minimize the demand for geographic expansion of public services due to residential growth.

c. Provide a variety of housing types in various densities and price ranges.

POLICIES

1. General Land Use Policies

a. Adopt the Land Use Plan as part of the Comprehensive Plan for Prince William County.

b. Update the Land Use Plan on a yearly basis.

c. Place all future development within a County-wide perspective of community facilities and public utilities planning.

d. Provide community facilities and public utilities only where they are consistent with the Land Use Plan.

e. Prevent the over-zoning of land in order to rationalize and guide land development in the County.

f. Reserve for agriculture the best farm lands which contribute to the agricultural economy of the County, through implementation of the Land Use Assessment Ordinance and the Rural-Agricultural zone.

g. Adopt, as part of the Land Use Plan, the Land Development Policies Map and the accompanying policy statements.

h. Adopt, as part of the Land Use Plan, the Short Range Highway Improvements Map and accompanying policy statements.

2. Land Use Policies Relating to Sewer and Water

a. Extend public water and sewer services designed to serve new development only within areas designated on the Land Development Policy Map for Commercial, Industrial, Employment and Suburban Residential uses.

b. Public water and sewer systems should be extended into Agricultural and Rural Residential Areas (as shown on the Land Development Policy Map) to correct existing deficiencies.

c. The County should continue to coordinate its efforts to provide water and sewage services to the Prince William Industrial Complex.

d. Private sewage treatment plants should not be permitted or allowed to expand unless the area to be served is designated on the Land Development Policy Map for commercial, industrial-employment or suburban residential development.

e. The County should adhere to the policies outlined in the Sewage Allocation Policy as approved by the Board of County Supervisors.

f. Adopt a Sewage Disposal Ordinance such as the one proposed by the County Public Health Department.

g. Discourage future development that depends upon septic tanks for disposal of wastes, except on sites which are demonstrably suitable for long-term septic tank use or where public sewers are planned to be extended in the next five-year period.

h. The County should carefully monitor the rate and location of development to avoid jeopardizing long range water supply sources.

i. County ordinances and policies should be amended to reflect the procedures necessary under the State Water Control Law, Regulation No. 3, which requires the County to grant a use permit for any non-governmentally owned sewage treatment plant before the State Water Control Board can give its final approval or issue a certificate.

3. Land Use Policies Relating to Transportation

a. Review annually the County's secondary road priorities and needs with the Virginia Department of Highways Resident Engineer, so that his six-year plan will reflect the County's priorities.

b. Stage the development of major roads to complement the planned development of the County.

(1) Provide for early construction of major roads only where the need exists or where development is desired.

(2) Provide improved access only to those areas where additional development is desired or where current needs exist.

(3) Encourage development that will assist in the timely improvement of high priority roads and intersections.

(4) Provide for the timing of new highway projects to coincide with the timing of other public facilities intended to implement development goals.

(5) Give priority to construction of roads that will serve industrial, commercial and other employment areas.

c. Separate through traffic from local traffic wherever possible.

d. Locate major traffic generators such as high-density residential areas and commercial areas close to major arteries.

e. Locate major industrial, commercial, and employment uses close to major roads so that minor residential streets will not be disturbed by traffic generated by these major uses.

f. Provide for sidewalks and pedestrian ways in order to encourage walking and to improve pedestrian safety, especially in high density areas, commercial areas, and around community facilities such as schools, parks and libraries.

g. Require fringe parking in large residential communities to promote mass transit service.

4. Land Use Policies Relating to Economic Development

a. Utilize the favorable physical and locational characteristics of the County, including highway and rail transportation and major electrical and gas supply lines, in planning for industrial development.

b. Reserve sewer capacity for industrial, employment and commercial uses.

c. Provide a variety of business and industrial zoning classifications that will encourage the location of desired firms in the County.

d. Develop planned unit development (PUD) zoning classifications for business and industrial uses.

e. Give preference to review of site plans for industrial, employment, or commercial uses upon resolution of the Board of County Supervisors.

f. Encourage land uses that positively affect the County Tax Base.

5. Land Use Policies Relating to Community Facilities

a. Adopt County-wide a legal and equitable method for requiring new residential development to help pay the costs of community facilities needed to serve the new development.

b. Identify and reserve in advance of development sites for community facilities by means of a long range land acquisition and development program.

c. Develop administrative procedures for an engineering evaluation of all sites proposed for community facilities.

d. Assure proper zoning for compatible use of areas adjacent to community facilities.

e. Encourage the donation of sites for community facilities such as schools, fire stations and libraries in large-scale developments.

f. Utilize the school-park concept in helping to satisfy the local park needs of residential areas.

g. Guide development into areas that are now served, or will soon be served, by adequate community facilities.

h. Locate elementary schools and neighborhood parks within residential areas so that school children and other pedestrians do not have to cross major highways to reach them.

6. Land Use Policies Relating to Environmental Management

a. Develop and adopt improved land use control ordinances -- i.e., zoning, site plan, subdivision, erosion control -- to insure that the conduct of development complies with the County's environmental standards and objectives.

b. Prepare and adopt a local wetlands ordinance as authorized under the Code of Virginia.

c. Prepare and adopt a Rural-Agricultural zone providing for very low intensity use in conjunction with the Prince William County Open Space Ordinance.

d. Prepare and adopt a Flood Plain Zoning Ordinance.

e. Investigate the feasibility of enforcing the water pollution ordinance to control sediment discharge.

f. Investigate the feasibility of adopting a stream valley ordinance.

g. Investigate the feasibility of adopting a slope protection ordinance.

h. Investigate the feasibility of adopting a tree preservation ordinance.

7. Land Use Policies Relating to Housing

a. The County should coordinate the construction of housing with the provision of community facilities and services.

b. The County should encourage cluster and "Planned unit developments" to allow for diversity and creativity in its residential areas and to encourage environmentally sound development.

c. The County should require adequate buffer areas between residential and commercial and industrial areas to maintain property values, neighborhood identity and physical attractiveness.

d. High density residential areas should be planned to be convenient to commercial and employment centers.

THE LAND DEVELOPMENT POLICY MAP

The Land Development Policy Map (Plate 3) is intended to show in graphic form the general land development policies the County will follow during the period from 1974 to 1980. The Map is an illustration of those major features of the Land Use Plan which can most readily be portrayed graphically. The Map shows the location and geographic relationship of major land use categories for the 1974-1980 period. The description, definition and specific policies for each land use category appear below in this section.

1. Impact on Existing Land Use and Zoning - Because the Land Development Policy Map shows general land development policy, it does not show all existing land uses not shown on the Land Development Policy Map. Adoption of the Land Development Policy Map will not adversely affect existing land uses.

The map does not reflect the existing zoning on every parcel of land in the County. No attempt is being made at this time to "down-zone" property which is currently zoned for more intensive uses than those shown on the map. Adoption of the Land Development Policy Map will not by itself change any existing zoning classifications in Prince William County. By not showing all areas as presently zoned, this policy map reflects the fact that all land zoned cannot possibly be developed during the period 1974-1980. It realistically reflects market demands, community facility constraints and areas to be served by water and sewer during this period. If a parcel can be developed as zoned, even though it is not shown on this map, without the necessity of providing new services, then nothing will stop this development from taking place.

2. Impact on Submitted Site and Subdivision Plans - The Map does not reflect all preliminary site and subdivision plans that have been submitted to the County for review and eventual approval. No attempt is being made to invalidate these preliminary plans. Adoption of the Land Development Policy Map will not invalidate submitted site or subdivision plans.

This policies map realistically reflects the availability -- existing and proposed -- of sewer capacity in the County during the 1974-1980 period. Given the validity of the Sewer Allocation Policy and the several contractual agreements for sewer capacity in the eastern part of the County, the sewer capacity will not be available for all site plans that have been submitted. Those site plans that are at the beginning of the approval process

will not receive sewer capacity and will not be able to develop until after 1980, and so have not been shown on the Land Development Policy Map.

If sewer capacity is provided on an accelerated basis, or if earlier site plans do not result in the development proposed, or if contractual agreements do not demand all of the capacity presently indicated, then the Land Development Policy Map should be amended to include more areas, including areas for which preliminary plans have been submitted.

3. Accommodation of Growth - The Land Development Map shows sufficient areas for growth in all land use categories. A comparison between Plate 2, Projected Residential Growth and the Land Development Policy Map will readily show that more land is provided for growth than is projected to be used by 1980. This has been done to provide flexibility and to allow for a continuous development process. These two concepts are explained below:

   Flexibility - Planning in the context of free enterprise does not permit absolutely certain predictions as to how rapidly a given developer is going to build. Some tracts of ground where almost immediate development is now anticipated may be delayed indefinitely due to circumstances not controlled by the County. Other tracts of land should therefore be included as alternate development areas.

   Continuous Development Process - The private land development process is a long one, often requiring five years from site analysis, through land acquisition, zoning, site plan review, sewer availability, building permits, and finally, occupancy. The intent of this plan is not to put a complete stop to the development process, which could be visualized as blocking completely the beginning of the development "pipeline". Instead, this plan seeks to establish a guidance system, in which the County is able to control the development process from the beginning of the pipeline. Some of the areas shown for major suburban residential development will, therefore, include development which will still be in the pipeline by 1980.

   Too much flexibility and too liberal an approach to guarding the beginning of the pipeline will result in no effective plan and no control or guidance. For example, the area identified as major suburban residential is now at maximum flexibility and very liberal with respect to the development pipeline. If all of the residential areas shown on this policies map were to become fully developed by 1980, the number of new dwelling units would surpass 45,000. The new population from these units would probably surpass 150,000 persons, or more persons than the entire County contains in 1974.

4. The Land Development Policy Areas - The Land Development Policy Map portrays seven major classes of land use. It should be remembered that these categories and the lines on the map are generalized and that they depict general development policy. The categories are as follows:

   a. Agricultural and Rural Residential Areas
   b. Major Suburban Residential Areas
   c. Major Commercial Areas
   d. Major Industrial and Employment Areas
   e. Major Critical Environmental Areas
   f. Major Community Facilities
   g. Major Government Reservations
   h. Major Office and Institutional Areas
   i. Mixed Development Areas

These categories and the accompanying policies are described below:

a. Agricultural and Rural Residential Areas

As a matter of general policy, these areas are designated for agricultural and rural residential uses during the period 1974 to 1980. Policies that apply to this area are as follows:

(1) Although each rezoning application must be evaluated on its own merits, rezoning requests to residential zones more intense than A-1, Agriculture, would not be consistent with the general Land Use Policy in these areas.

(2) Rezoning for other types of land uses will be consistent only if the proposed uses are consistent with existing agricultural and rural residential uses.

(3) Development of any land presently zoned for uses other than agriculture and rural residential will not be prevented, but proper site planning will be required to assure compatibility with existing agricultural and rural residential uses.

(4) A new zoning category, "Rural Agriculture RA-5", should be developed and adopted for land areas where desired by the owners.

(5) The zoning ordinance should be amended to provide for cluster development at densities equivalent to A-1 and RA-5.

b. Major Suburban Residential Areas

As general policy, these areas are designated for major suburban residential uses. No attempt is made to delineate the various densities recommended or permitted by existing zoning within this area.

Policies to be followed within these land development policy areas should be as follows:

(1) Although each rezoning application must be evaluated on its own merits, rezoning for any residential uses more dense than presently permitted will be consistent only if existing community facilities are adequate or if planned facilities will be adequate.

(2) Development of any land presently zoned for uses other than residential will be consistent, provided proper site planning assures compatibility with adjacent residential uses.

(3) Rezoning of land to non-residential uses will be consistent only if the proposed uses are consistent with existing and proposed residential uses.

(4) Zoning ordinance amendments should be prepared to provide for cluster residential developments and residential planned unit developments of various sizes and densities.

c. Major Commercial Areas

As general policy, these are designated as major commercial areas existing or to be developed during the period, 1974-1980. These are large commercial areas which constitute major traffic generators and which provide a wide range of commercial services to residents, non-residents and other sectors of the business community. Three types of major commercial developments predominate: the strip commercial area, the shopping center and the special purpose commercial. Each type of area presents special problems which will require strong policies if they are to be safe, convenient, profitable and an asset to the community.

Strip Commercial - Major strip commercial areas have been in existence for many years. They are characterized by retail stores and services that line both sides of major highways. This type of commercial development tends to be self-defeating in that it destroys the highway's traffic carrying capacity by which it is supported. Frequent and uncontrolled left turn movements cause accidents and the lack of sidewalks, sufficient parking and proper entrances are often problems. Visual appeal is sometimes lacking, with a hodge-podge of signs and variously styled buildings.

Shopping Centers - Suburban shopping centers are a relatively recent type of commercial development. They present many advantages over strip commercial areas, provided that they are properly located and designed. The policies below should be applied to the County's major shopping centers as well as other commercial development when applicable.

Special Purpose Commercial - Only one special purpose commercial development has been proposed in Prince William County for development during the period 1974 - 1980: the Great America Theme Park. New proposals of this category should not be approved without an amendment to this land use plan. These commercial developments tend to be seasonal. They are characterized by intensive development, large concentrations of traffic from areas outside of the County, and various spin-off effects on adjacent land uses. They also may present unique demands on county services.

Policies covering major commercial areas are as follows:

(1) Continue to up-grade commercial areas through strict application and enforcement of the site plan ordinance as commercial sites are remodelled and as residential uses are converted to commercial uses.

(2) Develop revised Zoning Ordinance provisions for commercial signs.

(3) Adopt a minimum set back requirement for buildings in commercial areas.

(4) Require sidewalks in commercial areas.

(5) Require dedication of right of way concurrently with site plan approvals in order to provide for future street widening.

(6) Identify areas where service drives are necessary in order to provide safe traffic movement.

(7) Cooperate with concerned business groups in efforts to up-grade strip commercial areas.

(8) Discourage the establishment of new strip commercial development on major thoroughfares and arterials.

(9) Prepare planned unit development zoning classifications for shopping centers in order to assure proper development.

(10) Because major commercial centers are often located adjacent to interchanges and other highway facilities that require future expansion, dedication of right of way and construction of needed road elements should be required at the time of site plan approval.

(11) Control of adjacent land uses should be exercised to prevent traffic congestion.

It should be remembered that an important part of the County's future commercial development will be in neighborhood shopping centers and other smaller areas not delineated on the Land Development Policy Map. These areas are too small to indicate on a general map.

d. Major Industrial and Employment Areas

Industrial development in Prince William County should be mainly of a type that is highly compatible with the residential, commercial and agricultural uses which predominate in the County. Probably the best opportunities for such development will come from light industries which desire close proximity to Washington. Laboratory-type light industrial plants are perhaps the foremost example. Since a location beside an Interstate Highway is considered choice because of its advertising value, several such locations have been indicated in the eastern part of the County.

There is frequently a tendency to zone all railroad frontage on navigable waterways for industry in the hopes that a large number of desirable industrial plants will be attracted. More acreage of industrially zoned land does not attract, and it sometimes has a tendency to encourage a scattered development of tiny industrial establishments which inflate the price of the land and drive the larger industries elsewhere. Furthermore, it usually has the effect of discouraging other types of development on nearby property. However, some industries may need railroad or barge facilities. For these reasons, industrial area has been indicated along the Richmond, Fredericksburg and Potomac Railroad along the Potomac River just north of Quantico Creek. In addition, a potential industrial park area has been indicated near the Woodbridge Airport.

In the Manassas area, a number of industrial establishments have been located along the Southern Railroad between Manassas and Gainesville. The County supervisors have indicated by their zoning policy that they welcome industry in this locality. In recognition of this established trend, sizeable industrial areas have been suggested along the railroad close to Manassas, and in close proximity to the major highway interchanges and the airport.

The following policies relating to industrial and employment areas should be followed:

(1) Provide sewer capacity for the industrial and employment areas.

(2) Prepare and adopt an industrial park division in the Zoning Ordinance.

(3) Assist desirable employers to locate in the County in the areas indicated on the policy map.

(4) Rezonings for non-industrial uses will be consistent only if the proposed uses are consistent with existing and proposed industrial uses.

e. Major Critical Environmental Areas

Several types of critical environmental areas are shown on the Land Development Policy Map. These are as follows:

Flood Plains - These areas are shown along the major streams of the County. They are areas where future development should be strictly controlled through the adoption of a Flood Plain Ordinance amendment to the County's zoning map. An additional recommendation is to develop a "Streambelt System" based upon a proposal made in the Environmental Management Plan section of the Comprehensive

Plan, which could take in areas bordering streams above the flood plain limits, where massive tree cutting or grading could be detrimental to the stream.

Wetlands - These areas occur in the eastern part of the County around the estuaries of the creeks that flow into the Potomac River.

Water Supply Protection Areas - These areas occur around Lake Manassas and the Occoquan Reservoir. Both are critical to the County's water supply through the period 1974 to 1980. The extent of these areas depends mostly upon soil types and topography. Recognition of the special problems associated with land development in these areas is needed.

Historic Site Protection Areas. - The major area identified thus far is the area that is directly visible from the Manassas Battlefield Park and which has not already been zoned for intensive development. Development in this area should be at very low densities with minimal disturbance of landscapes. A second, smaller area surrounds Beverly Mill, near Thoroughfare Gap.

Scenic Resource Protection Areas - The only major area identified thus far is the Bull Run Mountain area. This is the County's most outstanding scenic resource. Development in this area should be at very low densities, with minimal disturbance of the landscape and tree cover. Intensive development of the Bull Run Mountains could also cause disasterous soil erosion and downstream sedimentation.

Environmentally Sensitive Areas - Although every parcel of ground may present at least minor problems for development, there are areas of the County where erodable soils, rugged topography, and existing tree cover combine to present severe environmental as well as economic constraints to intense development. Sections of eastern Prince William County as well as areas in the Occoquan and lower Bull Run watersheds fall into this category. Many of these areas have not yet been zoned for uses other than agriculture and low density residential. Such areas should remain as low density areas and should not be rezoned to more intensive use. Where zoning already permits intensive development, special care should be required to assure environmentally sound development.

Many areas designated as major critical environmental areas on the Land Development Policy Map combine more than one of the characteristics identified above.

It should be emphasized that the boundaries of these areas are generalized and that it is not the intention of the Land Use Plan to prohibit all development within the Critical Environmental Areas. Rather, the designation of these areas is a recognition of their sensitivity to environmental damage and the consequent desirability of low density development and special attention to standards of development.

In addition to the policies set forth in the beginning of this section, the following policies should be observed relative to Critical Environmental Areas.

Require any proposed development in a

Critical Environment Area (prior to rezoning, subdivision, or site plan approval, as the case may be) to undergo a review to determine:

(1) Whether the nature of the proposed use is in conformance with the intentions of the Critical Environmental Areas System. Any use requiring large cleared and graded areas - such as shopping centers, major industrial uses and the like are clearly inappropriate. Scattered single family homes (or a cluster in some cases), recreational uses, forest preserves, agriculture and the like could be consistent with the Critical Environmental Areas.

(2) Whether the intensity of the proposed use is consistent with the Critical Environmental Areas Concept. The lowest density possible should be maintained in the Critical Environmental Areas. In general, no area within a Critical Environmental Area should experience a density higher than one residential unit per five acres, although clustering to achieve this net density is possible in some cases.

(3) Whether the environmental protection measures proposed would insure the minimum environmental damage possible given the "state of the art" of engineering practice. Anyone proposing significant development within a Critical Environmental Area should provide plans for preservation of cover, clearing, grading, erosion control and the like, so that the County may determine that effective protection is planned.

(4) Whether the proposed use will increase the demand for public facilities to be located in a Critical Environmental Area. It is the intention of the County that minimum disturbance of Critical Environmental Areas occur so that any proposed use permitted must not markedly increase the demand for public facilities (such as schools, new roads, and sewer and water systems) within the Critical Environmental area.

f. Major Community Facilities

Several categories of major community facilities are shown on the Land Development Policy Map. These are:

Parks and Preserves: Included in this designation are the Manassas Battlefield Park, the Conway Robinson State Forest, the Prince William Forest Park, the Featherstone Marsh Wildlife Refuge, Ben Lomond Park, Marumsco Park and the parkland recently acquired by the County along Route 1 south of Dumfries.

Major County Facilities that Serve the Public: Included in this designation are the County's high schools, hospitals and community services complexes. The one new high school projected for development late in the 1974 - 1980 period has been shown in the Route 1 area. The exact location has not been selected, but it should be somewhere in the eastern part of the County. The location shown is, therefore, illustrative only.

Sewage Treatment Plants: Included in this designation are the Dale Service Corporation plants and the County's new Potomac Plant. These will be the only major plants in existence by the end of the

1974 - 1980 period, due to the State Water Control Board requirement to phase out the existing plants. The UOSA plant will exist, of course, but it will be located in Fairfax County. The County's existing sewage treatment plants have not been shown.

Interstate Highway Right of Way: Included in this designation is the existing right of way of the County's two interstate highways, I-66 and I-95. Also shown is the right-of-way that will be required to provide for expansion of existing interchanges and the addition of two new interchanges, one on I-66 for general traffic use and one on I-95 for use by mass transit vehicles.

The following policies concerning major community facilities should be observed.

(1) Any new proposals for major parks or other major County public facility will require amendment of the Land Use Plan.

(2) Any new proposals for major sewage treatment plants (1 million gallons per day capacity or larger) will require amendment of the Land Use Plan.

(3) Detailed sketches of major interstate interchanges should be made as that land may be reserved and protected for future expansion of the interchanges.

g. Major Government Reservations

The Land Development Policy Map should recognize the continued existence of major federal government reservations in Prince William County. Two areas are shown: the Quantico Marine Corps Base and the Army Transmitting Station on Belmont Bay. No other major federal government reservations are shown for the period 1974 - 1980. Policies for these areas are as follows:

(1) Any new proposals for major government reservations will require amendment of the Land Use Plan.

(2) Cooperative use opportunities should be investigated for these existing government reservations.

(3) Communications with federal government agencies should be maintained so that the County will know of major changes taking place on these reservations that may affect the County.

h. Major Office and Institutional Areas

As general policy, these areas along Route 234 are designated for office and institutional uses. These are uses of a light commercial nature and often serve as buffers between residential areas and general commercial areas. These uses are also appropriate where homes on small lots front on streets that have changed from little country roads to major thoroughfares or arterial highways. Such small residential lots may then be converted to office and institutional uses.

i. Mixed Development Areas

As general policy, these properties in the Dale Service Corporation franchise area are designated for all types of development: residential, commercial, industrial employment, office, institutional and community facilities.

SHORT RANGE MAJOR HIGHWAY IMPROVEMENTS MAP

Plate 4 is the Short Range Major Highway Improvements Map. It is an integral part of the Land Use Plan in that it shows the County's policy with respect to the general location of future highways that can optimistically be planned for development during the 1974-1980 period. This map shows only expressways and arterials of more than strictly local importance. It does not show smaller roads such as thoroughfares, local streets and secondary roads.

This map shows the same improvements as those proposed in the Transportation Plan for Prince William County. It corresponds to the first and second priority improvements shown in that document. The Transportation Plan contains a description and discussion of each proposed improvement. The purpose for including this map in the Land Use Plan is to emphasize the relationship between major highway improvements and land use policy. The County's land use policies should reflect the need for major roads in the future to serve the development anticipated by the land use policy.

The Transportation Plan for Prince William County contains additional road improvement proposals based upon the expectation of continued development within the County. This Short Range Major Highway Improvements Map, therefore, does not include the longer range highway needs of the County. Longer range needs are discussed in the Transportation Plan.

All of the roads shown will not be fully constructed by 1980, but the needed rights-of-way will be threatened by development from now on. Therefore, planning for these major roads must be undertaken immediately so that the needed rights-of-way will be available when road construction is finally undertaken.

It is very costly to have to purchase developed property for road improvements, especially if buildings must be bought. It is also costly in human terms, to force relocation of homes and businesses or to encroach upon buildings and yards with major arterial roads. The greatest cost, perhaps, is when the road becomes unfeasible to build due to development in the way of the road; in that event the road is not built and the whole community suffers.

Roads and land use are inextricably related. Future arterials would not be needed if there was to be little or no development in the future. Planning and reserving right-of-way for future roads is therefore an investment in the future. Equally important are current road needs caused by development taking place now. Any major development should be expected to provide road improvements on and adjacent to the site that are necessary to serve the development.

As a statement of land use policy, the Short Range Major Highway Improvements Map shows the general location of major roads. In some instances, these roads have been thoroughly planned and engineered and the rights-of-way have been thoroughly planned for many years, but never surveyed. Other roads are relatively recent proposals. All road improvements shown on the map that have not been tied down by detailed plans should be studied further. The policies that accompany this map are as follows:

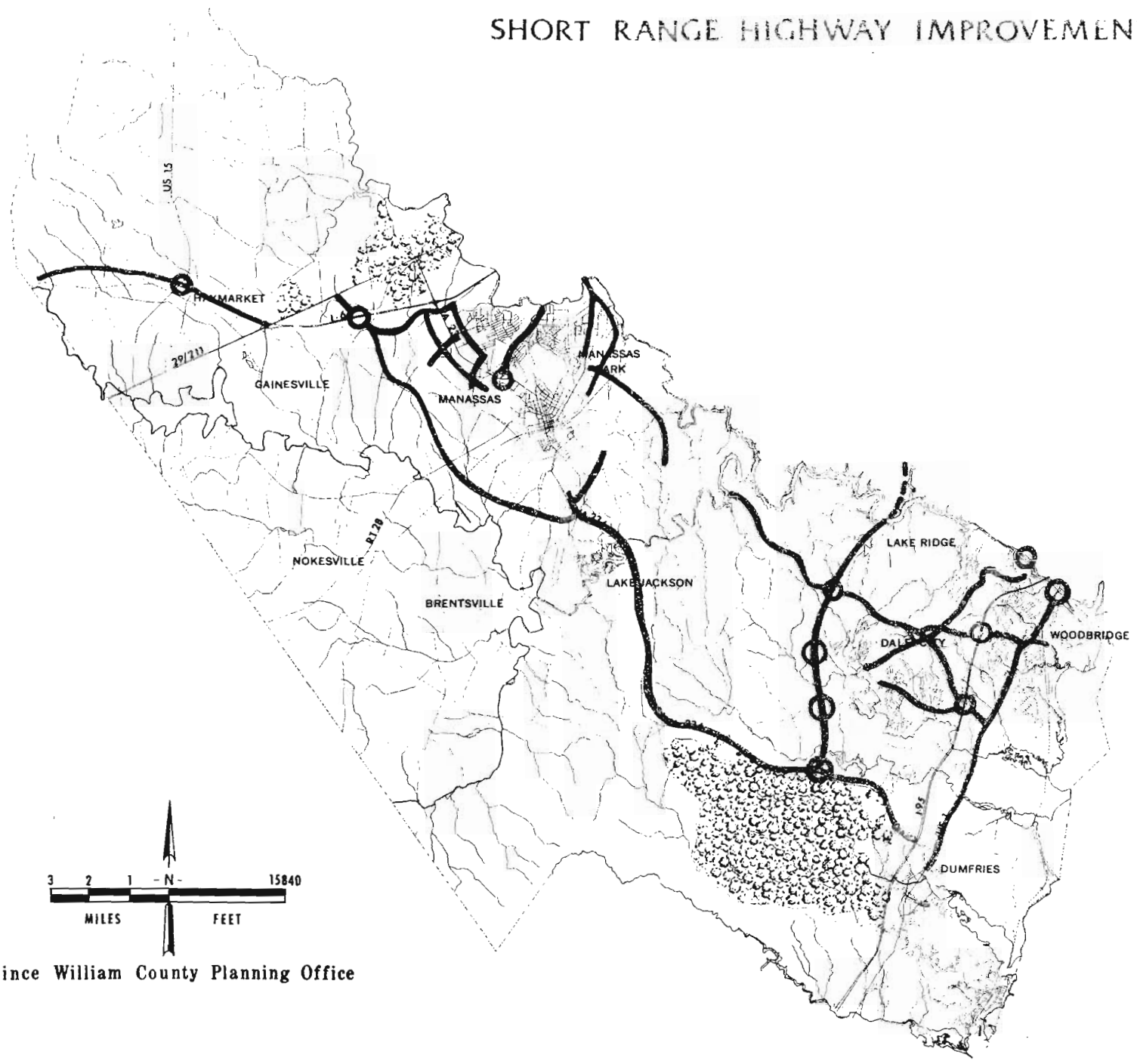
1. Priorities for the construction of these roads will be established in the Transportation Plan element of the Comprehensive Plan.

2. The Virginia Department of Highways should be requested to prepare functional plans for all roads and interchanges shown on the Short Range Major Highway Improvements Map.

3. The Virginia Department of Highways should be requested to establish the center-line and right-of-way lines for all roads and interchanges shown on the Short Range Major Highway Improvements Map.

4. Developers should be requested to dedicate or reserve the right-of-way for roads and interchanges that are shown on the adopted Short Range Major Highway Improvements Map.

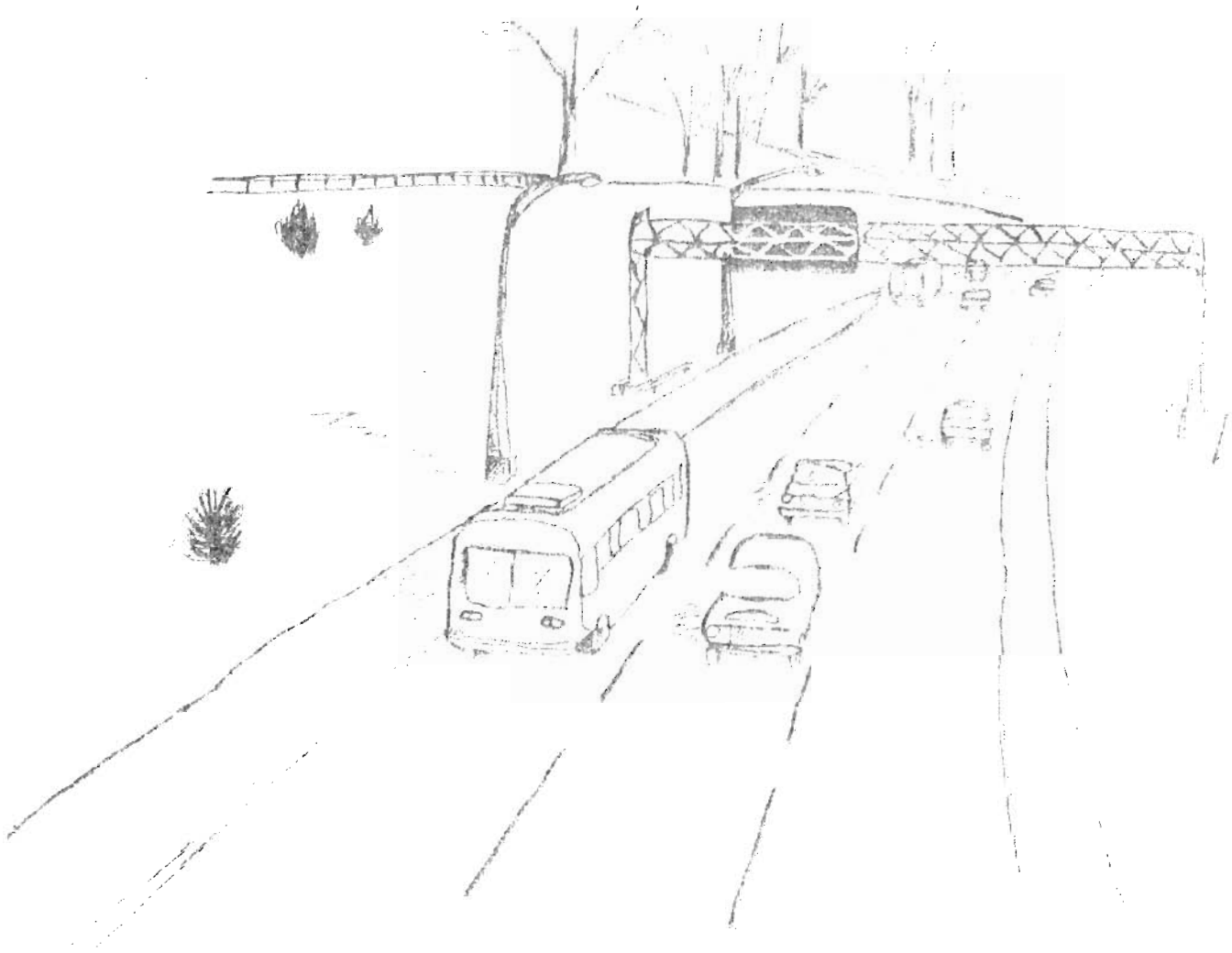
SHORT RANGE HIGHWAY IMPROVEMENTS



Prince William County Planning Office

This should be accomplished when site and subdivision plans are given final approval.

5. Developers should be required to carry out improvements to the public road system through and adjacent to the development if such improvements are part of an adopted plan and if the improvements will be necessary for traffic movement into and out of the development.



4 The Land Use Plan as An Element Of The Planning Process

RELATIONSHIP OF THE PLAN TO LAND USE ASSESSMENT

The Commonwealth of Virginia requires that any land which is to receive Use Value Taxation based on agricultural, horticultural, forest or open space use be consistent with the local land use plan. To be consistent, the use must be:

1. Use of a class intended to be encouraged or permitted in the location in question, as shown by the designation of proposed uses on the Land Use Plan Map.

2. Clearly in agreement with one of the stated goals and objectives of the Land Use Plan.

Based on the above criteria, the area identified as Agricultural and Rural Residential and the area designated Major Critical Environmental Areas on the Land Development Policy Map are fully consistent with agricultural, horticultural, forest and open space uses. Therefore, a parcel located in either of these two areas would qualify for special use value taxation with respect to the Land Use Plan.

RELATIONSHIP OF THE LAND USE PLAN TO EXISTING ADOPTED PLANS

This County-wide Land Use Plan is general in scope. It is also time-related, in that the Land Development Policy Map indicates future Land Use Policy to 1980. Much development will undoubtedly take place after 1980, which is not indicated on this map.

The five adopted planning area plans, the "Prince William Industrial Complex" Plan and the "Routes 640-641-642 Corridor" Study are "full development" plans. In other words, they are not time-related. They show ultimate densities and land uses after the area has been fully developed. This full development may not take place until 1990 or 2000.

The Land Use Plan contains objectives and policies that can be applied county-wide without conflicting with any of the Planning Area plans. This is because the Land Use Plan is general in its application and also because many of the same land use planning principles are involved.

1. The Land Development Policy Map

   The Land Development Policy Map should not conflict with the planning area plans. It merely indicates what areas should be brought into the development process by 1980 and what areas should be developed after 1980. It is also general in that the Land Development Policy Map is concerned with major categories of land use: it does not provide for detailed land use planning, which has been done at the planning area level in the past.

2. The Short Range Major Highway Improvements Map

   This highway improvements map will conflict in several instances with adopted planning area plans. In general, these conflicts are relatively minor in that the map shows adjusted alignments for several new roads and proposes several new roads where none appeared on existing plans.

   The Third Beltway is not shown on the Short Range Major Highway Improvements Map. It is no longer considered a viable proposal. It is possible that a portion of the Second Beltway (Outer Beltway) may be proposed to enter Prince William County. This possibility will be thoroughly studied prior to proposing it for adoption on a County plan.

Where conflicts exist, the Short Range Major Highway Improvements Map should hold, thereby automatically amending planning area plans where a conflict exists.

RELATIONSHIP OF THE LAND USE PLAN TO MORE DETAILED PLANNING

As noted above, this Land Use Plan is general in scope and pertains to Land Use Policy from 1974 to 1980. More detailed planning should continue in sub-county areas. As more detailed plans are prepared, they should be brought forth as additions to the County-wide plan. The County-wide plan provides the very important policy framework for preparation of more detailed plans. This County-wide policy framework has been lacking in the past.

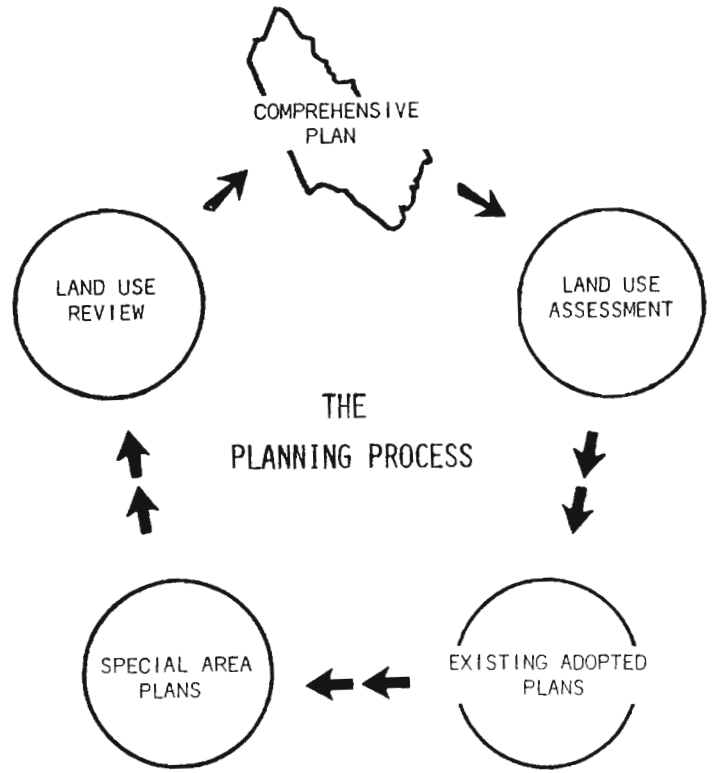
Longer range planning should also be carried out to provide a basis for shaping the County's growth to 1990, 2000 and beyond. This longer range planning should address issues such as the development of "new communities" in Prince William County, long range sewer planning, long range water supply and distribution planning, and possible future urban development centers in areas such as Gainesville, Haymarket, Nokesville or Independent Hill. As this longer range planning is carried out, it should be brought forth as additions and modifications to this County-wide Land Use Plan.

REVIEW, REVISION AND RE-ADOPTION OF THE COUNTY-WIDE LAND USE PLAN

This County-wide Land Use Plan will be reconsidered on an annual basis, in a manner similar to the annual review of the Capital Improvements Program. There are three major reasons for an annual review: (1) unforeseen changes take place in a rapidly growing county such as Prince William, necessitating adjustments to the plan; (2) new concepts and better information are constantly being developed for use in the planning process; (3) the horizon of the plan, especially the Land Development Policies Map, should be extended as the years pass.

As mentioned above, more detailed planning and longer range planning should be carried out and adopted as additions to this County-wide Land Use Plan. This does not replace, however, the need for annual review of the basic Land Use Plan and the policies that it sets forth.

The planning process can be seen as a cyclical process. Each time the cycle is completed anew, plans should be up-dated and improved, greater detail should be added and longer range concepts developed. Out of the planning process should fall the basic products of plans: the concepts, policies, ordinances, and implementation techniques that will create better communities in the future. No man-made plan has all of the answers for all time; therefore review, revision and re-adoption are necessary elements of the planning process.



Appendix

EXISTING ZONING MAP (GENERALIZED)

Existing zoning (generalized) in Prince William County, as of January, 1975, is shown on Plate 5. A careful comparison of the zoning map and the 1974-1980 Land Development Policy Map (Plate 3) will reveal that areas zoned for a particular use are not all shown for development, as presently zoned, during the period 1974-1980.

This illustrates the extent to which the County is "overzoned" as well as the County's inability to provide needed services - schools, parks, fire protection, improved roads, public water supply, public sewer lines and capacities - to all areas presently zoned for industrial, commercial, and suburban residential uses.

This comparison also shows where the County will seek to concentrate its efforts to provide services and community facilities necessary for future development during this period, 1974-1980. As mentioned above, however, nothing in this Land Use Plan is intended to prohibit land development according to existing zoning. Additionally, it should again be noted that Plate 3, the 1974-1980 Land Development Policy Map, is general in character and does not identify the smallest zoned areas.

The comparison of Plates 3 and 5 should also serve to demonstrate the difference between a "zoning map" and a "development policy map". The development policy map indicates generally expected or desired development patterns in the County. The zoning map indicates what land uses are permitted in the County.

The existing zoning map may help to explain why the land development policy map looks as it does. Existing zoning must be given recognition in arriving at a land development policy map or else the policy map will be unrealistic, arbitrary and of little help in directing public investments in new community facilities. As the planning process is strengthened, the land development policy map should play a greater role in guiding decision-making on rezoning applications.

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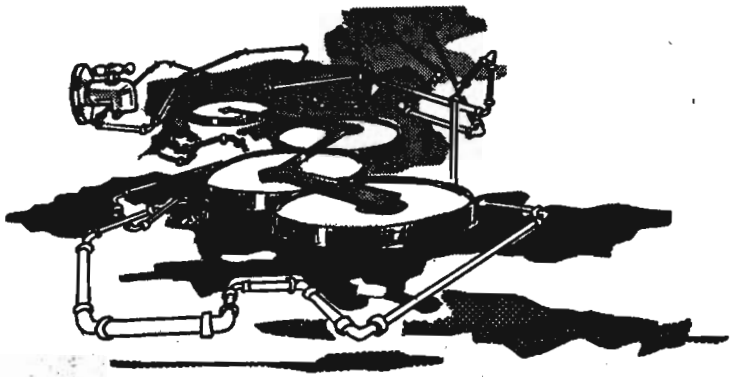
COMPREHENSIVE PLAN FOR PRINCE WILLIAM COUNTY, VIRGINIA

SECTION II WHERE ARE WE GOING?



Part D

SEWER and WATER FACILITIES PLAN

Adopted December 1974

PRINCE WILLIAM COUNTY PLANNING OFFICE

Board of County Supervisors

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A part of the comprehensive plan for the physical development within the jurisdiction of Prince William County, pursuant to the provisions of Title 15.1, Chapter 11, Article 3 of the laws of the Commonwealth of Virginia.

Prince William County Planning Office
Garfield Administration Building
15920 Jefferson Davis Highway
Woodbridge, Virginia 22191

PRINCE WILLIAM COUNTY

BOARD OF COUNTY SUPERVISORS

9250 LEE AVENUE
MANASSAS, VIRGINIA
PHONE: (703) 368-9171

The Citizens of Prince William County

Ladies and Gentlemen:

It is our pleasure to present herewith the Sewer and Water Facilities Plan for Prince William County, adopted by the Board of County Supervisors by Resolution#75-18-17 of December 10, 1974.

This plan is an integral portion of the Comprehensive Plan for the physical development of Prince William County. The Sewer and Water Facilities Plan outlines a short range (1974-1980) plan as well as a longer range sewer program and a perspective on water supply planning.

Several public hearings were held on this plan by the Planning Commission and the Board of County Supervisors. The interest and assistance of County citizens have been beneficial to the development of this adopted version. While the plan will be modified periodically, it is hoped that it will serve as a basis for the County's development. As such, it should be of considerable assistance in building a finer County.

Respectfully presented,

Charles J. Colgan, Chairman
Prince William County Board of Supervisors

HGB/sah

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SEWER and WATER FACILITIES PLAN

Introduction

OUTLINE OF PLAN

Section I of the Comprehensive Plan described the existing sewage treatment and water facilities in Prince William County. Included in this description are the certified capacities of all major sewage treatment plants in the County as well as the average daily flows of these facilities. Table 1 summarizes this data. Plate 1 shows the boundaries of the Sanitary Districts within the County; and Plate 2 shows the areas presently served by water and sewer services. Section I briefly introduced the planning activities of organizations responsible for sewer and water services within the County. However, Section I did not discuss these activities in great detail. It did not outline the financial and water quality implications of providing sewer and water service in the future. These subjects will be discussed in greater detail in this plan. Section I of the Comprehensive Plan did make reference to two of the underlying problems that will be addressed in this plan for sewer and water services in the 1974-1979 period. Specifically, Section I stated:

> "It is clear, however, that public sewage treatment facilities will not be able to meet all of the demands that developers are bringing forth in the form of final development plans for new residential, commercial and industrial facilities. It is also clear that Prince William County suffers from a lack of balanced growth."

Although not specifically presented in Section I of the Comprehensive Plan, Prince William County presently has a number of existing sewer and water problems that should be rectified while the County proceeds on implementing plans for future water and sewer services. Because of this act, the first section of the Sewer and Water Facilities Plan will describe the existing problems and the actions that should be taken immediately to alleviate these problems. For organizational purposes, the Sewer and Water Facilities Plan will be divided into a sewer element and a water element. The sewer element will discuss short range (1974-1979) sewer plans for Prince William County, as well as present a long range perspective. The water element will outline short range (1974-1979) water plans for Prince William County, and present a long range perspective on water supply planning. The short range plans of both the sewer and water element will relate to the land use proposals of Section II of the Comprehensive Plan.

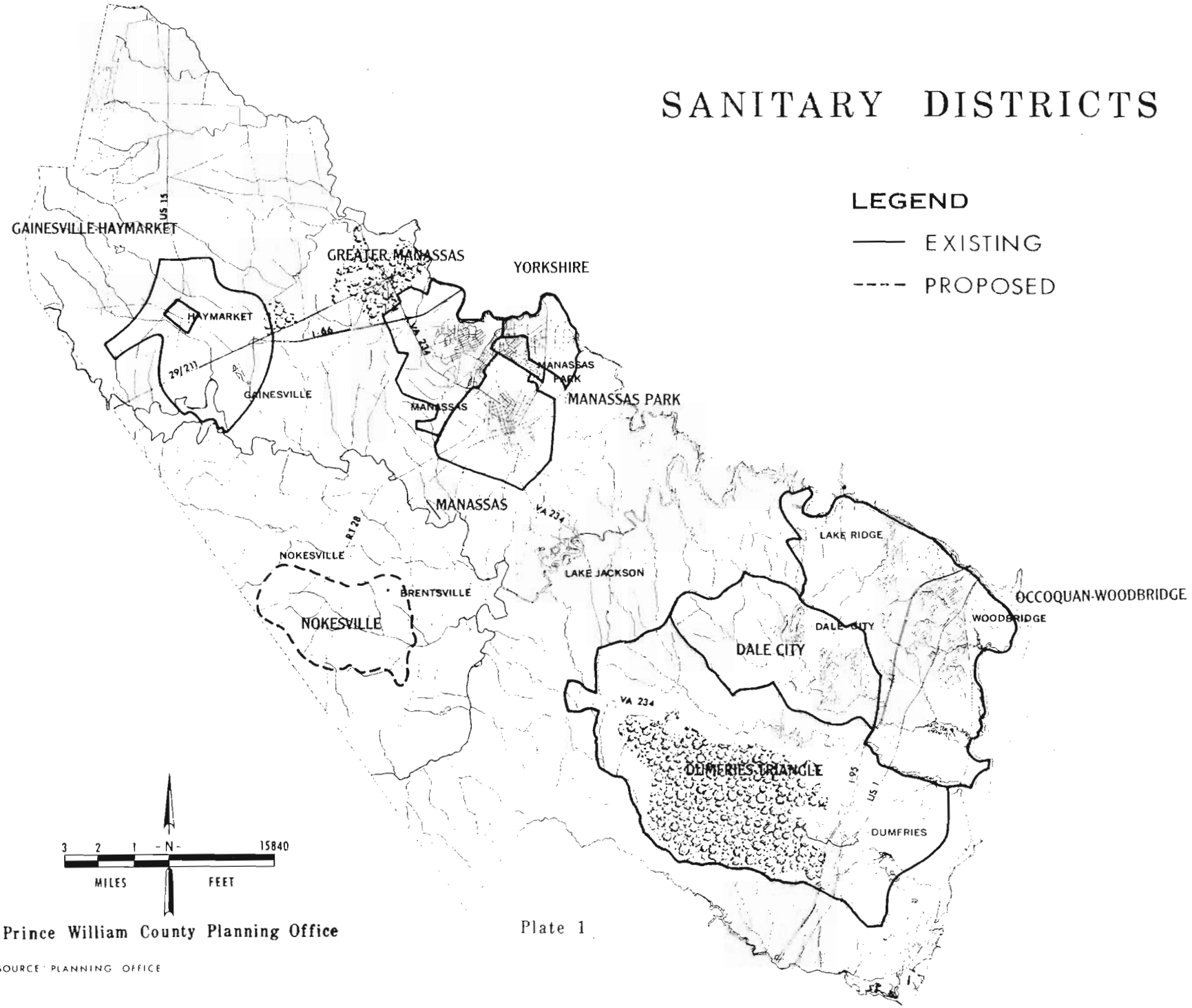
TABLE 1

SELECTED CHARACTERISTICS OF MAJOR SEWAGE TREATMENT FACILITIES IN PRINCE WILLIAM COUNTY

Sanitary District Jurisdiction/Plant	Hydraulic Flow Millions of Gallons Per Day - Average		Pollutant - BOD - Lbs/Day-Average		Quantities Suspended Solids Lbs/Day-Average	
	DESIGN	LOADING[1]	ALLOW.	ACTUAL[1]	ALLOW.	ACTUAL[1]
Eastern Prince William						
Occoquan/Woodbridge S. D.:	3.550	2.989	805	413.8	843	355.0
Neabsco Plant	1.250	.791	302	93.4	302	76.5
Belmont Plant	1.00	1.051	258	156.0	284	106.1
Featherstone Plant	1.00	.755	167	102.6	167	126.6
Occoquan Plant	.300	.392	78	61.8	90	45.8
Dumfries/Triangle S. D.:	1.250	.811	242	76.4	242	106.4
Dumfries Plant	1.00	.703	200	48.1	200	82.1
Melrose Plant	.250	.108	42	28.3	42	24.3
Dale (City) Service Corp. Private	4.0	2.06	400	179.0	400	230.0
#8	2.0	.64	200	37	200	64
#1	2.0	1.42	200	142	200	166
Western Prince William						
Greater Manassas S. D.:	2.390	1.90	252	35.2	252	87.8
Old Centreville Rd. Plant	1.430	1.21	100	15.1	100	50.4
West Gate (Loch Lomond) Plant	.960	0.69	152	20.1	152	37.4
Yorkshire S. D.:						
Manassas, Town:	.938	0.815	188	92.0	208	86.0
Liberia Plant	.338	0.246	68	31	68	31
Northside Plant	.680	0.569	120	61	140	55
Manassas Park, Town:	.688	N.A.	137.7	____	137.7	N.A.
Plant #1	.344		83.2		83.2	
Plant #2	.344		54.5		54.5	

[1] These loadings were results for the month of October, 1973.

SANITARY DISTRICTS

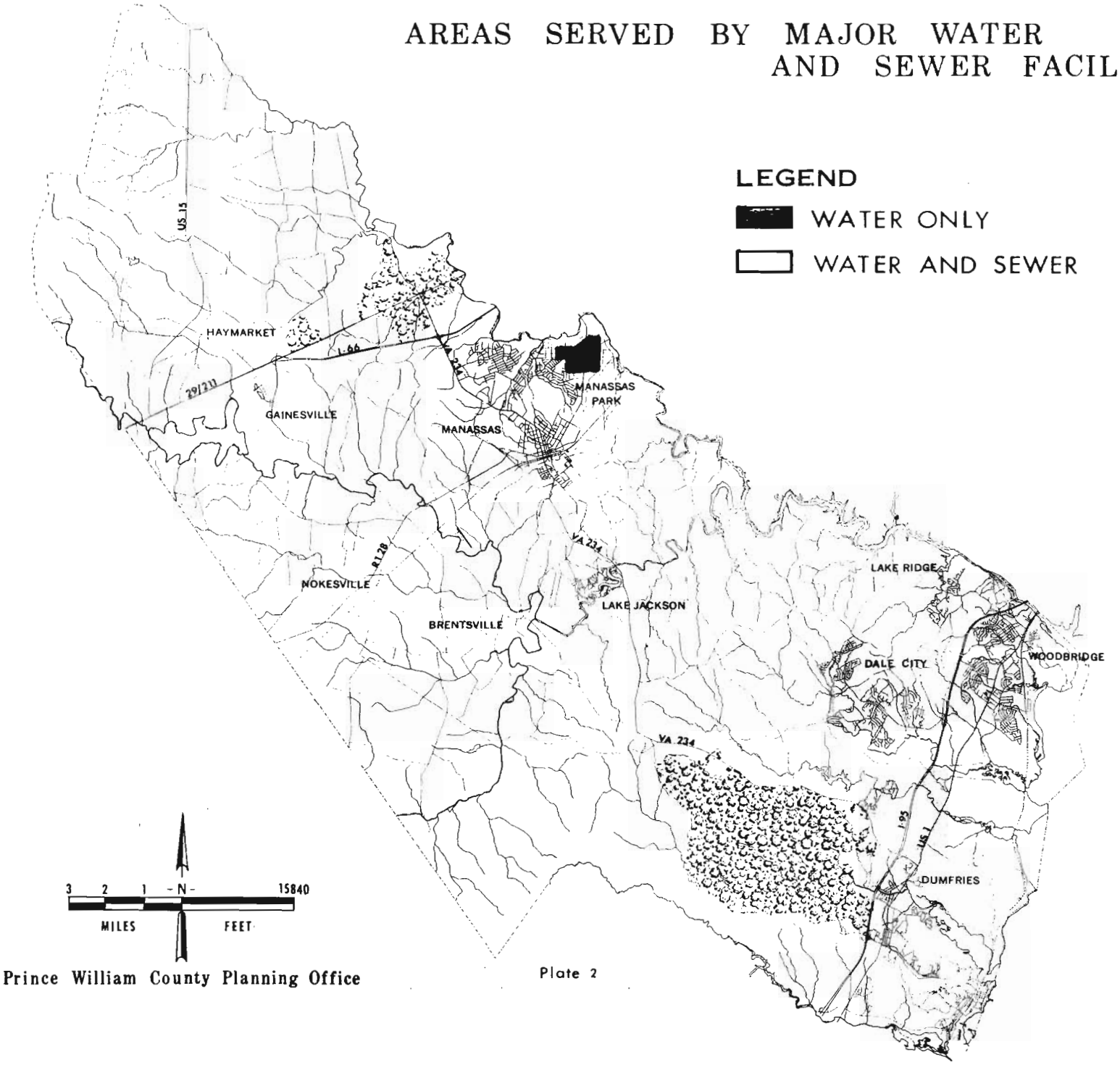


Prince William County Planning Office

Plate 1

SOURCE: PLANNING OFFICE

AREAS SERVED BY MAJOR WATER AND SEWER FACILITIES



Prince William County Planning Office

Plate 2

The last section of the Sewer and Water Facilities Plan will discuss implementation policies to implement the earlier sections of the plan.

OBJECTIVES OF SEWER AND WATER SERVICES

The water and sewer plan is based on a number of broad objectives. Although every program may not relate specifically to each of the eight objectives, collectively, these statements form the nucleus of the goals the Sewer and Water Facilities Plan is attempting to accomplish. They are as follows:

1. Provide adequate, safe, efficient and economically feasible public sewer and water systems in all presently developed areas.

2. Minimize environmental damage resulting from inadequate waste disposal facilities through the coordination of community growth and sewage facility expansion.

3. Utilize water and sewer facilities as a tool for shaping the direction, extent and timing of urban development.

4. Provide a tool for encouraging balanced growth, especially industrial, commercial and employment uses.

5. Provide a plan that assures adequacy of programmed production facilities satisfactory from a qualitative, quantitative and timing standpoint.

6. Cooperate with multi-jurisdictional sewer and water authorities or other organizations.

7. Seek adequate long range water supply sources for the County.

8. Aid rural residents in securing safe, adequate and economically feasible individual sewage and water systems.

1 *Existing Problems and Immediate Needs*

BACKGROUND PERSPECTIVE

Centralized (public) water and sewage facilities are a prerequisite for developing land at urban densities. For instance, the Prince William County Zoning Ordinance requires centralized water and sewer facilities for any residential structure located on less than one acre of land. Because of this fact, most of the urbanized areas of the County are currently served by sewer and water facilities. In 1970, the census listed 27,760 occupied housing units in Prince William County. Seventy-seven percent (77%) or 21,337 of these occupied units were served by public sewer. Nineteen percent (19%) or 5,320 occupied units were listed on septic tanks or "disposal" and four percent (4%) or 1,103 occupied units were described as employing "other means" for sewage disposal.

In regards to source of water, the 1970 Census reported that of Prince William County's 27,760 occupied units, eighty-three percent (83%) or 22,969 occupied units were on either a public or private water system, and sixteen percent (16%) or 4,555 units had wells. Less than one percent (1%) or 236 occupied units were listed in the "other" catagory. The census defines this category as "spring, creek, or river and all other sources". In order to further refine these statistics, Table 2 shows the number of total occupied housing units without plumbing facilities by type of deficiency. Table 3 illustrates that most of the units without plumbing occur in low and moderate cost units.

From Table 3, it can be shown that many of the individual sewage disposal problems such as the 1,021 occupied units which lack flush toilet facilities occur in either owner-occupied units of less than $25,000 value or rental units costing less than $200.00 per month. From this, one must conclude that although the majority of Prince William County housing units are served by some type of centralized water and sewer services, the occupied units with sewage disposal and water problems occur predominantly in the County's low income population.

Besides being a necessity for residential development in an urbanized area, most commercial, industrial, and public facilities in these areas must also be served by centralized sewer and water. In short, the availability of water and sewage facilities are a critical element in determining present and future land uses in developing areas. Unlike other capital facilities which often follow development, (i.e., the upgrading of roads and the provision of adequate recreational facilities) sanitary services must be in place before development can occur.

LOCALIZED PROBLEMS

1. Yorkshire - A number of existing water and sewer problems that need immediate attention are specific to geographical areas. According to local health officials, foremost among these are the sewage disposal problems in the Yorkshire area. During the summer of 1973, an Environmental Health Survey of the Yorkshire area was undertaken by the Prince William County Health Department. The survey included a total of 567 residential, commercial and other types of buildings. All but 3 of these buildings had some method of sewage disposal. Public sanitary sewer served 13 buildings, while septic tank systems were installed for 517, and pit privies served the remaining 34 dwellings.

   Of the 517 buildings on septic tank systems, the number of malfunctioning systems was found to be 191. In the survey, all the pit privies were observed to be unsanitary, and of these, the liquid waste was improperly disposed of in 23 instances.

   Largely through the efforts of the Yorkshire Civic Association, a 2.4 million dollar bond referendum for construction of a sanitary sewer system for Yorkshire passed in December of

TABLE 2

TOTAL OCCUPIED HOUSING UNITS WITHOUT PLUMBING BY TYPE OF DEFICIENCY
1970*

JURISDICTION	Total Units Without Plumbing	Bathtub or Shower		Piped Water		Flush Toilet	
		Shared	None	Cold Water Only	None	Shared	None
Prince William County	1,242	53	979	352	499	56	1,021

*Complete plumbing is piped hot and cold water inside the structure, flush toilet, bathtub or shower inside structure for use of occupants of the unit.

Source: 1970 Census, Second Chart

TABLE 3

LOW/MODERATE INCOME UNITS WITHOUT COMPLETE PLUMBING
1970*

JURISDICTION	Owner Occupied Units Only			Renter Occupied Units Only			All Units (Combined)		
	Total #	%	$25,000	Total #	%	$200 mo.	Total #	% both	$25,000 $200 mo.
Prince William County	502		89.2	496		80.4	998		84.8

*Complete plumbing is piped hot and cold water inside the structure, flush toilet, bathtub or shower inside the structure for use of occupants of the unit.

Source: 1970 Census, Second Count Summary Tape.

1971. The amount of money approved in the bond referendum was greater than the Yorkshire Sanitary District's legal capacity to borrow. The District's legal capacity is 1.8 million dollars or 18% of the Sanitary District's assessed value. The Yorkshire Sanitary District is actively working on the sewer project. Preliminary engineering work has been completed. The engineers have shown a total project cost of approximately 6 million dollars, which includes only the construction of sewer lines and pump stations and does not include the construction of any waste-water treatment plants. Originally, the Yorkshire project was not intended tc be completed until the Upper Occoquan Sewage Authority's Treatment Plant opened in late 1975 or early 1976. In December of 1973, the Prince William Board of County Supervisors requested that the State Water Control Board expedite the Yorkshire project by allowing the Yorkshire area to treat its waste-water at the Greater Manassas Sanitary Treatment Plant. The State Water Control Board has okayed this request. The State Water Control Board is allowing .300 mgd to be treated at the Greater Manassas Sanitary District Plant prior to the opening of the Upper Occoquan Sewage Authority's Plant. This .300 mgd will be for the use of existing units in the Yorkshire area.

County and Sanitary District officials are seeking State and Federal aid for the Yorkshire project. The County has requested priority treatment on this request because the Yorkshire area qualifies as a "health hazard", eligible for "health hazard grants". At the end of 1973, the State Water Control Board announced that the Yorkshire Sanitary District would get top priority in fiscal year 1975 for 5.4 million dollars in state and federal sewer funds. County Sanitary District officials expect to receive grant money in fiscal 1975 for the Yorkshire Sanitary District project.

2. Gainesville - Haymarket - The second priority area of the County where sewage problems exist is Gainesville-Haymarket. Although not faced with the magnitude of Yorkshire's problems, the Gainesville-Haymarket area has a number of areas where septic tanks are malfunctioning. In a recent County Health Department check, eighteen out of twenty homes in one Gainesville neighborhood had septic tank problems. Besides malfunctioning septic tanks, many wells in the Gainesville-Haymarket area are also contaminated. The Town of Haymarket has long had sewage problems within its boundaries. To rectify this, the Town has tried to join the Gainesville - Haymarket Sanitary District. In the middle of 1973, the Virginia Supreme Court ruled that the Town of Haymarket could not join the Gainesville-Haymarket Sanitary District for the purposes of receiving water and sewer services. However, this does not preclude the town from contracting the Gainesville-Haymarket Sanitary District for these services when the Sanitary District becomes operational.

In July, 1973, the Board of County Supervisors (BOCS) passed two resolutions which may help in solving some of the Gainesville-Haymarket area's sanitary problems. First, the BOCS passed a resolution allowing the Town of Haymarket to appoint a non-voting, liason member to the Gainesville-Haymarket Sanitary District Advisory Committee, and also a resolution stating that the Gainesville-Haymarket area sewage problems will be actively considered during any development of sewer projects in that area. This is significant in that the County is actively seeking to provide water and sewer services to the Prince William Industrial Complex. The Industrial Complex abuts the Gainesville-Haymarket area. An engineering firm has already prepared a study on providing water services to the Industrial Complex. The Board is currently studying ways of implementing this study. Significant growth is not projected for the Gainesville-Haymarket area during the next five years. Therefore, a solution to the existing sewage treatment problem should

not be premised upon rapid and immediate growth in this area. It should seek to provide service to industrial users and to existing development.

3. Nokesville - The third geographic area of the County with sewage problems is Nokesville. Due primarily to poor soil conditions, this area is not well suited for septic tanks. Because of this, the Nokesville area has been proposed to be a Sanitary District, and the area is presently served by a small treatment plant which serves two schools and residential units in the town. This plant is currently in need of repairs. To meet this need, a preliminary application requesting federal assistance from the Farmers Home Administration of the Department of Agriculture has been made. This $55,000 loan request was for the following projects:

   a. Construction of 3360 feet of 8 inch sewer line to connect schools and town to sewage treatment plant;

   b. Addition of chemical feed facilities to remove phosphorous from the sewage; and

   c. Reparation of holding pond to detain and remove algae from effluent.

   To date, (December, 1973) approval of this loan has not been received from the Federal Government. Because approval has not been forthcoming, County Sanitary District officials have already repaired the holding pond and are planning to add chemical feed facilities. The sewer line is still needed as severe infiltration exists. County Sanitary District officials are currently seeking local funds to complete this project.

4. Independent Hill - A fourth problem area is the Independent Hill community. Specifically, since the early 1970s, the residents of Independent Hill have had increasing difficulty in securing suitable individual water supplies. Many of the wells have been contaminated, and some of the water from the wells has caused sickness.

   In 1972, an application to the Farmers Home Administration soliciting a $65,000 grant and a $65,000 loan was submitted by the County. The application stated that the requested project would replace individual shallow wells, which are now serving fifty residential units and which have become contaminated. Water distribution facilities will be constructed from four existing deep wells to serve these units. Fire hydrants will also be installed. In July of 1973, the County received notification that the Farmers Home Administration had authorized funds for the project. Since receiving that notification, a number of procedural difficulties have arisen which are holding up authorization of the federal funds. In order to expedite the project, the Dumfries-Triangle Sanitary District may now finance the project.

5. Isolated Problem Areas Throughout the County - Having outlined some of the County's major problem areas, as well as documenting some of the actions needed to ameliorate these problems, there are a number of isolated cases in other parts of the County where sewage and water problems exist. These isolated instances are found in both the urbanized and rural sections of the County. For example, the small rural community located on Route 234 approximately one-half mile south of the intersection of Route 643 presents an immediate health problem to its inhabitants. A similar problem within an urbanized area is Pine Street in Woodbridge.

   Most of the problem areas within the urbanized areas fall within the boundaries of Sanitary Districts where public sewage and water facilities are available. Because of this, sewage and water problems in urbanized areas are relatively simple to solve. This report will now focus on the isolated cases in rural areas of the County.

Generally, the problems within rural areas are more difficult for the County to alleviate. First, if public sewer was extended to serve these areas, a conflict would occur between development policies aimed at planning the orderly growth of the County and the provision of these necessary services to these rural residents. In other words, providing public water and sewer facilities from existing facilities might cause premature development around or within these isolated communities, and this would be inconsistent with the environmental planning and development policies expressed in the Land Use section of the Comprehensive Plan. As stated at the beginning of the Sewer and Water Facilities Plan, this plan reflects the land development policies of the adopted Land Use Plan, 1974 - 1980.

The cost of providing rural residents with services is often prohibitive to both the local jurisdiction and the residents involved. As illustrated earlier in this report, many of the water and sewage problems in the County affect low-income residents. The costs of availability and connection fees needed to hook into a new sewer system would be difficult to meet. Unfortunately, the major costs to an individual are for the lateral system leading to a person's property line as well as the cost of the plumbing installations. Historically, these costs have never been covered under any Federal, State, or local funding program.

Some Federal programs exist for home rehabilitation loans and grants to alleviate water and sewer problems in rural areas. Besides using Federal and State programs, local jurisdictions may set aside funds to loan to low income residents for home rehabilitation. Although Prince William County does not have such a fund, two jurisdictions in the Washington Metropolitan Area have Rehabilitation Loan Funds which can be utilized by low income families for home repair. Fairfax County provides additional monies from its General Fund for improvements in special areas. Among eight priorities for the use of the $473,000 set aside from the County's General Fund, Fairfax County's water service has first priority and the provision of sanitary sewers has fourth priority. This program is scheduled to continue through 1975. A program such as this should be instituted in Prince William County.

Many of the problems outlined above require a comprehensive approach if they are to be solved. In order to rectify many of these situations, more coordination is required among County departments. For instance, within Prince William County, the Health Department reports and monitors the cases occurring because of inadequate water and sewer service. The Planning Office is concerned with the overall growth and development of the County. The various Sanitary Districts are occupied with providing service in accord with overall demand and ability to pay. The following programs are outlined to ensure coordination among the various County departments in solving the problems outlined above. These administrative suggestions should be immediately enacted:

a. The Public Health Department and Social Service Department should provide the Planning Office and sewage officials with information on families without plumbing and their ability to pay for water and sewer services.

b. The Planning Department and the sanitary officials should advise the Public Health and Social Services Departments of the type of assistance available.

c. Designation of a water/sewer specialist to assist low income families in obtaining water and sewer services should be made.

COUNTY-WIDE PROBLEMS

1. Septic Systems - A second category of existing water and sewer problems that deserve immediate attention occur County-wide. One of these problems is the increasing number of septic systems being built in the County, especially in large subdivisions. During 1972, the Prince William Health Department issued over one thousand permits for septic systems. During the first half of 1973, the Health Department has issued an average of seventy-five septic tank permits per month. The increasing number of new septic tank permits has caused concern among County health and soil experts. As pointed out in Section I of the Comprehensive Plan, the great majority of soils in Prince William County are either "unsuited" or "poor to fair" for septic systems. This is particularly true in the central and western portions of the County. When large subdivisions employing septic systems and wells are placed in this area of the County, there is a chance that eventually the septic system will contaminate the water supply. Without adequate, functioning septic fields, contaminated wastes could reach surface water supplies and streams, as well as the surrounding groundwater.

In response to this problem, the local Health Department of Prince William County recently proposed to update the County's sewage disposal ordinance (originally written in 1939). One section of this proposed ordinance requires that a homeowner have sufficient land for a complete repair or replacement of a septic system. In other words, a homeowner must have sufficient land suitable for a second drainfield. Although adoption of the new Sewage Disposal Ordinance will help to prevent future septic tank problems, the County must continue to closely monitor this situation.

As of June, 1974, the Sewage Disposal Ordinance had not yet had a public hearing before the Prince William County Board of Supervisors. This is needed before an ordinance may be acted upon. In March of 1974, the Prince William County Health Department proposed that a water supply ordinance also be adopted by the Board of Supervisors. This ordinance is intended to apply to all wells intended for use or used for supplying groundwater for domestic purposes except that it will not apply to those wells which are subject to approval by the Virginia State Health Department as public or community water supplies. As of June, 1974, the Water Supply Ordinance had not had a public hearing before the Board of County Supervisors.

2. Water Quality Standards

   a. Eastern Prince William County. A second County-wide problem is Prince William County's ability to achieve the effluent standards of the State and the Federal Government. Because of the goal of eliminating water pollution, these standards are most stringent. In the eastern portions of the County, treated sewage will soon have to meet the Potomac Embayment Standards, shown on Table 4. These will be enforced after the Potomac Regional Plant is operational by mid-1978.

      Presently, the major sewage treatment plants in eastern Prince William County are certified for the treatment levels shown in Table 5. As can be seen from this, the embayment standards are stricter than any standards currently in effect in eastern Prince William County.

   b. Western Prince William County. The bulk of western Prince William County which is currently served by sewage treatment facilities lies within the Occoquan Watershed. Specifically, the major treatment facilities which serve the Greater Manassas area all eventually drain into the Occoquan Reservoir. This reservoir is currently the water supply for approximately 500,000

TABLE 4

STATE WATER CONTROL BOARD EMBAYMENT STANDARDS

Parameter	Maximum Concentration, mg/l
BOD_5	3.0
Total P	0.2
Total N	1.0
DO	6.0*

SOURCE: State Water Control Board

* This parameter is not formally established as part of the Embayment standards; however, it is likely that the staff of the SWCB would establish as an effluent requirement in the embayment area a D.O. concentration of 6.0 mg/l or greater. Thus, it is possible that 6.0 mg/l would be the minimum D.O. requirement on a discharge in the Potomac Embayment area.

TABLE 5

CERTIFIED REMOVAL EFFICIENCIES OF MAJOR TREATMENT PLANTS IN EASTERN PRINCE WILLIAM COUNTY

Plant	BOD_5 mg/l	Suspended Solids mg/l
Occoquan	31	33
Belmont	31	33
Featherstone (0.3 mgd)	31	33
(1.0 mgd)	20	20
Neabsco	20	31
Dumfries	24	24
Melrose	31	33
Dale City - Section 1	12	12
Dale City - Section 8	12	12

SOURCE: Water Quality Management for Metropolitan Washington, The Northern Virginia Plan: April, 1973

northern Virginians. Throughout the 1960s, the Occoquan Reservoir exhibited a number of serious water quality problems. In 1968, the State Water Control Board had a series of studies made of the water quality in the Occoquan Reservoir. These studies confirmed that there were serious water quality problems, largely due to the discharge of sewage wastes, which are nutrient rich and are marginal in quality from the standpoint of BOD, suspended solids and other constituents they contain. From these studies, in July, 1971, the State Water Control Board approved a comprehensive program known as the Occoquan Watershed Policy. The Occoquan policy calls for extremely high effluent standards to be achieved in the Occoquan Basin. These standards require a maximum of 1 mg/l BOD_5, whereas the Potomac Embayment Standards tolerate a maximum concentration of 3 mg/l of BOD_5. The minimum effluent requirements for the Occoquan Watershed under the Occoquan Policy are shown on Table 6. Table 7 shows the certified loading limits for the major existing treatment plants in western Prince William County. As illustrated by comparing Tables 6 and 7, the proposed Upper Occoquan Sewage Authority Regional Plant will have to treat the waste water to a much higher degree than the existing plants are now required to meet.

In September, 1972, the four plants of the Occoquan-Woodbridge Sanitary District were placed under Requirement No. 1 of the

TABLE 6

MINIMUM EFFLUENT QUALITY REQUIREMENTS FOR PROPOSED PLANT IN THE OCCOQUAN WATERSHED

	BOD	COD	Suspended Solids	Nitrogen	Phosphorus
	Mg/1	Mg/1	Mg/1	Mg/1	Mg/1
Final Effluent Requirements	1.0	10.0	0	1	0.1
Typical Percent Removals (These are for information only: not requirements)	99.5%	98.0%	100%	97%	99.5%

Source: Water Quality Management for Metropolitan Washington, The Northern Virginia Plan, 1972

TABLE 7

CERTIFIED REMOVAL EFFICIENCIES OF MAJOR TREATMENT PLANTS IN WESTERN PRINCE WILLIAM COUNTY

Plant	Present SWCB Certified Flow MGD	Maximum Allowable Pollutant Load to Stream* BOD_5 Lbs/Day	Suspended Solids Lbs/Day	BOD_5 Mg/1
Town of Manassas-Northside				
Trickling Filter	0.680	120	140	24
Contact Aeration	0.300	65	65	26
Liberia	0.338	68	68	24
G.M.S.D.	1.000	100	100	12
Manassas Park 1	0.344	83.2	83.2	29
Manassas Park 2	0.344	54.5	54.5	19
Westgate	0.96	152	152	18

*Note: Interim Program will allow modest increase in Plant Flow, provided efficiency of the plant is increased so that the present allowable pollutant loads to the stream remain at or below the levels listed above.

SOURCE: Water Quality Management for Metropolitan Washington, The Northern Virginia Plan, 1972

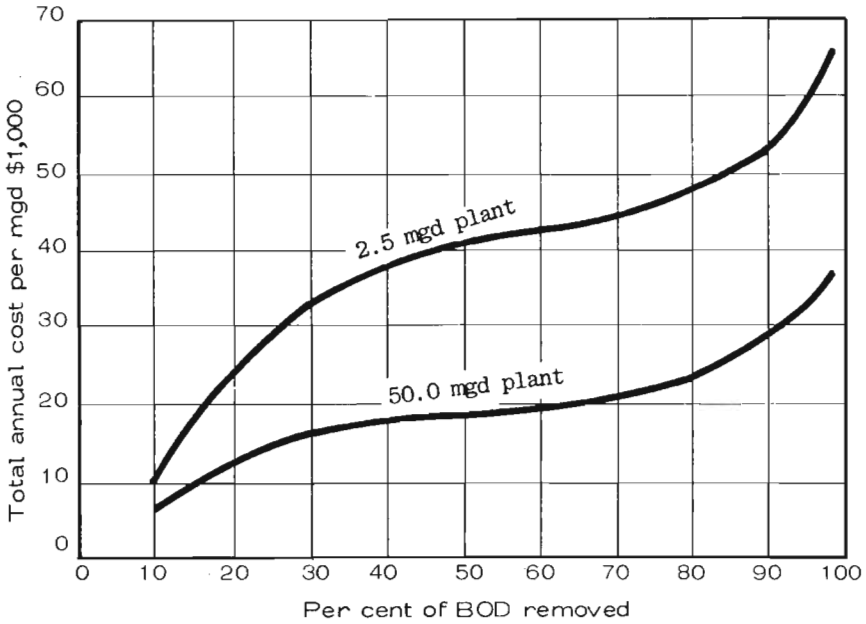
State Water Control Board. In essence, Requirement No. 1 placed a moratorium on all further sewer connections within the Sanitary District until the Sanitary District operated its four plants within their certified limits. In August, 1973, the State Water Control Board lifted the moratorium because data from the Occoquan-Woodbridge Sanitary District indicated that during the previous months of April, May, and June, the four treatment plants had operated within their "certified loading" limits. As pointed out in Table 1, other treatment facilities within the County are at or near their certified capacities. Further moratoriums can be expected if the County does not develop treatment facilities which can meet the tougher standards enforced by the State Water Control Board.

One of the major obstacles toward achieving the water quality standards called for by the State Water Control Board is the high costs of achieving such advanced waste water treatment. Only through building large regional treatment plants does a jurisdiction achieve savings through economies of scale. In order to illustrate this, Graph 1 shows the interrelationship between the high cost of providing tertiary (i.e., 99% BOD removal) treatment and the savings obtained through economies of scale. The graph also illustrates the exponential costs of achieving 95-98% degree of removal of BOD.

3. Multiplicity of Institutions Providing Water and Sewer Service - The last major County-wide sewer and water problem is the multiplicity of institutions and organizations which play a part in the delivery of water and sewer services to the County. Although related, three identifiable problems arise because of this fragmentation of services.

RELATIONSHIP BETWEEN DEGREE OF BASIC OXYGEN DEMAND REMOVAL AND COSTS

Costs based on 20-year 4 1/2% bonds



Source: R. J. Frankel, "Cost-Quality Relationships in an Engineering-Economic Model for Municipal Waste Disposal", ASCE Water Resources Engineering Conference, Mobile, Alabama, 1965.

a. Duplication of Costs. A multiplicity of institutions providing sewer and water services means higher costs through duplication and inefficiency. This problem was identified in a 1965 report written by a consulting firm for the Greater Manassas Sanitary District. That report, entitled Report on Greater Manassas Sanitary District Waterworks Facilities for Prince William County, stated:

"There is a distinct need for joint long-range planning and cooperation with other sanitary districts, towns, or political subdivisions, who have similar problems.... At present, the Town of Manassas and the Yorkshire Sanitary District, both just adjacent to Greater Manassas, have water utility problems. There are also other nearby areas in a similar situation. For each of these areas to consider individual water needs, without due regard for the overall situations, can only lead to duplicate expenditures and greater costs that could be avoided by joint long-range planning and cooperation...."

Today, eight years after this was written, there is still a need for long range planning and cooperation since much of the fragmentation of services highlighted in this 1965 report still exists. As the costs of providing these basic services continue to rise, cooperation and coordination is even more essential.

b. Need for Coordination in Planning of All Capital Facilities. The main water and sewer agencies within the County are Sanitary Districts, with independent taxing power and individual advisory committees. Because of this independence and the Districts' primary concern with the provision of water and sewer services, the Sanitary Districts' expansion programs have not been cognizant of the other capital facilities (i.e., schools, parks) which development incurs and which must be provided by the County. Close cooperation must exist between the Sanitary Districts and the County to ensure that all types of capital facilities are adequately programmed. This same type of cooperation must exist between the County's incorporated jurisdictions with sewage treatment capabilities for when they allow development to occur, this development creates a demand for other services (i.e., schools) which only the County can provide.

c. Lack of Coordination Between Water and Sewer Agencies and County Planning Programs. Because of the independent nature of Sanitary Districts and County planning in the past, there has also been minimal coordination between the Sanitary Districts and other County departments. Without close cooperation, utility lines might be installed in areas which the County has designated for low intensity land uses. Likewise, areas which the County may have designated for intensive land uses may not be programmed for utility lines at all.

d. Immediate Action Program to Coordinate the Fragmentation of Sewer and Water Services. Although sewer and water programs are still provided on a fragmented basis, the Prince William Board of County Supervisors has moved to improve the planning, coordination, and provision of sewer and water services within the County. The County's participation in the Upper Occoquan Sewage Authority and the County's plans to build a regional plant in eastern Prince William County are good examples. A second indication is the Board's approval of the Northern Virginia Planning District Commission's report entitled Water Quality Management for Metropolitan Washington: The Northern Virginia Plan. (April, 1973)

Recently, the Board of County Supervisor took a major step in coordinating sewage programs with County-wide goals and plans. This was the Board's adoption of a Policy for the Allocation of Sewage Capacity (approved

in late 1973). The objectives of the policy are outlined below:

1. Provide for sewage flows that do not exceed certified levels as determined by the State Water Control Board.

2. Satisfy existing legal commitments for sewage treatment capacity.

3. Provide for new public, semi-public, commercial, office, institutional and industrial development so as to achieve a more balanced community and to provide a viable fiscal position for the County.

4. Provide an equitable system for allocating sewage treatment capacities to those requesting it, both to large scale developments and to small projects.

5. Provide for elimination of health hazards by allocating capacity to existing development that does not have adequate sewage disposal facilities.

To quote the policy:

> "Such a policy should also be viewed as an aspect of the implementation of the Comprehensive Plan for Prince William County. As such, it will assist in fulfillment of the intent of planning, which is to improve public health, safety, convenience or welfare and to plan for the future development of counties to the end that transportation systems be carefully planned; that new community centers be developed with adequate highway, utility, health, educational, and recreational facilities; that the needs of agriculture, industry and business be recognized in future growth; that residential areas be provided with healthful surroundings for family life; and that the growth of the County be consonant with the efficient and economical use of public funds...."

The essence of the policy is to allocate sewage capacity by type of land use. According to the policy, available sewage capacity shall initially be allocated by the following percentages:

(a)	70%	Residential uses that require site plans or subdivision plat approval as defined by the County's Site Plan and Subdivision Ordinances.
(b)	5%	Residential uses that do not require site plan or subdivision plat approval.
(c)	20%	Industrial, commercial, office, institutional, public, semi-public and other public benefit uses.
(d)	5%	Elimination of health hazards.
	100%	TOTAL

The Allocation Policy has been established through the cooperation of the Sanitary Districts, the County Public Works Department, the County Planning Office, and the County Executive's Office. By attempting to "balance" land uses through the reservations of sewage capacity, the Allocation Policy is an important tool in achieving the sewer and water objectives stated at the beginning of this report.

2 *The Sewer Element*

The first section of the Water and Sewer Plan describes some of the immediate sewer and water problems confronting Prince William County. It also describes some of the remedial actions already underway, as well as some suggested strategies to further ameliorate these problems. This section of the plan will present a short range sewer program (1974-1979) as well as outlining some longer range programs for the County. As stated earlier, the short range (1974-1979) sewer plan supports and is an integral part of the proposed Land Use Element of the Comprehensive Plan for Prince William County. There are a number of public and private organizations which provide sewer services to the residents of Prince William County. Table 1 outlined these organizations and Plate 1 illustrated their boundaries. Most engage in long range planning activities. A review of these activities by the major sewage "providers" will be given to help place this five year plan in perspective. Discussion of these planning activities will first focus on the organizations in western Prince William County, and then on the organizations serving eastern Prince William County.

WESTERN PRINCE WILLIAM COUNTY

1. The Occoquan Watershed Policy. Most of the western half of Prince William County lies within the Occoquan Watershed. In July, 1971, the State Water Control Board adopted A Policy for Waste Treatment and Water Quality Management in the Occoquan Watershed. The Occoquan Policy established total allotments of treated waste-water discharges for the watershed, set plant capacity allotments, established a long range policy for regional treatment plants, promulgated an interim expansion program for existing plants, and instituted a number of other programs. Their actions make it one of the most comprehensive water quality management policies in the Country.

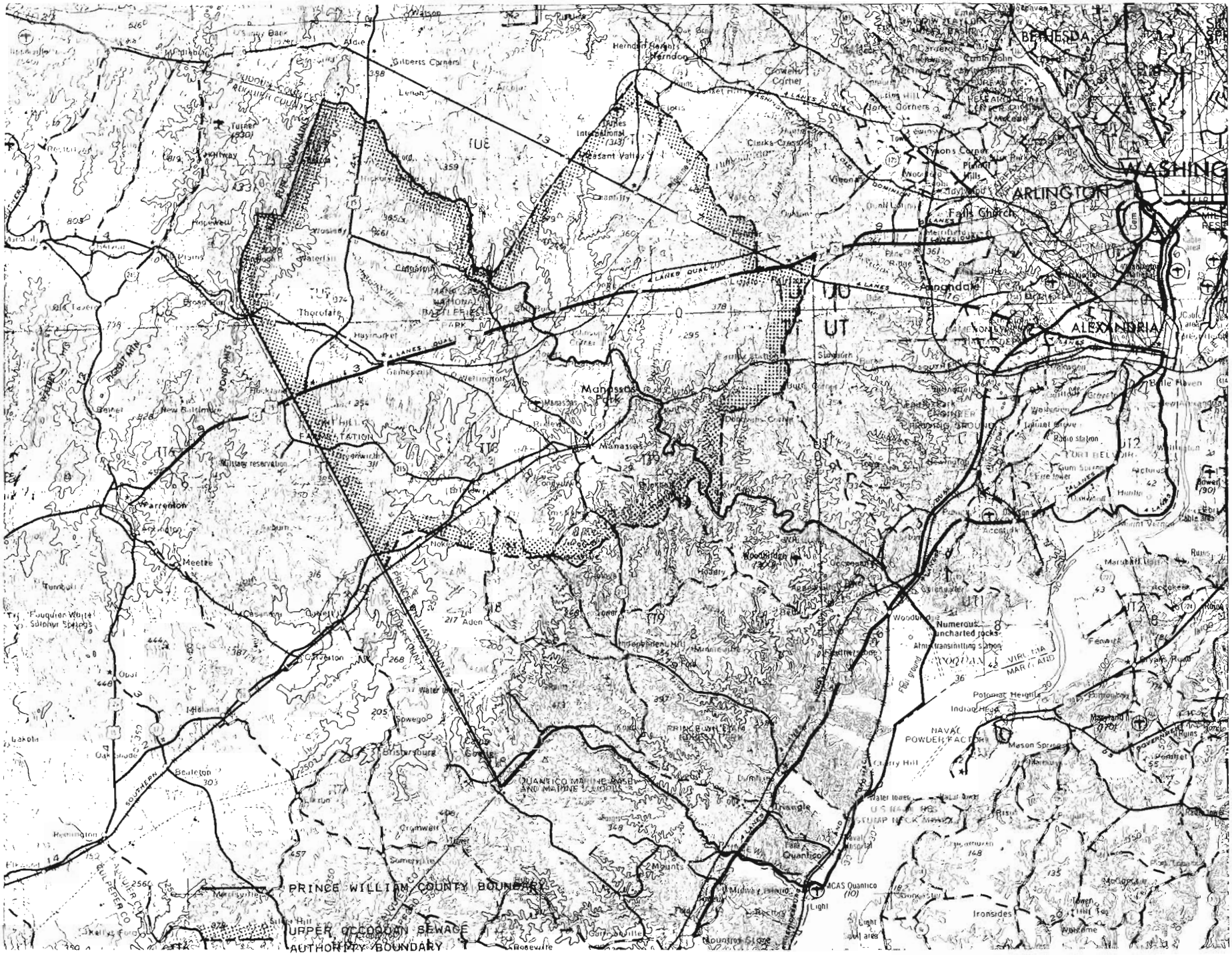
As a result of this policy, stringent regulations have been placed on the expansion of sewage services in the Occoquan Watershed. The Occoquan Watershed Policy calls for a regional sewage collection system and an advanced regional treatment plant. To implement this, the State Water Control Board recommended that a single political entity be formed. This resulted in the formation of the Upper Occoquan Sewage Authority. The boundaries of the Authority are shown on Plate 3. The Authority is comprised of two members from each of four political jurisdictions which lie within the Occoquan Watershed. They are the Counties of Prince William and Fairfax, and the Towns of Manassas and Manassas Park.

The governing bodies of all four member jurisdictions signed a service agreement in May of 1972 which directs the Upper Occoquan Sewer Authority to construct a regional advanced wastewater treatment plant and to construct interceptor sewer lines to collect the sewage from the four jurisdictions. Plate 4 shows the location of these interceptor lines within Prince William County. The Occoquan Policy states that when the regional plant is operational (presently scheduled to be in late 1975 or early 1976), all major treatment plants within the watershed must be phased out. All interim expansion of existing plants must be made with the understanding that they will be phased out when the regional plant is operational.

The Upper Occoquan Sewage Authority is strictly a wholesale processor of sewage. The County's sanitary districts and the incorporated jurisdictions of western Prince William County will continue to be responsible for the collector lines within their respective districts.

The May, 1972, Service Agreement calls for a 22.5 mgd (constructed in 3-7 1/2 mgd trains) advanced wastewater treatment plant to be built at the location shown on Plate 4. Although built to handle 22.5 mgd, the Occoquan Policy calls for an initial 100% redundancy or "back-up" capability.

UPPER OCCOQUAN SEWAGE AUTHORITY LIMITS



GENERAL LOCATION REGIONAL INTERCEPTOR SYSTEM

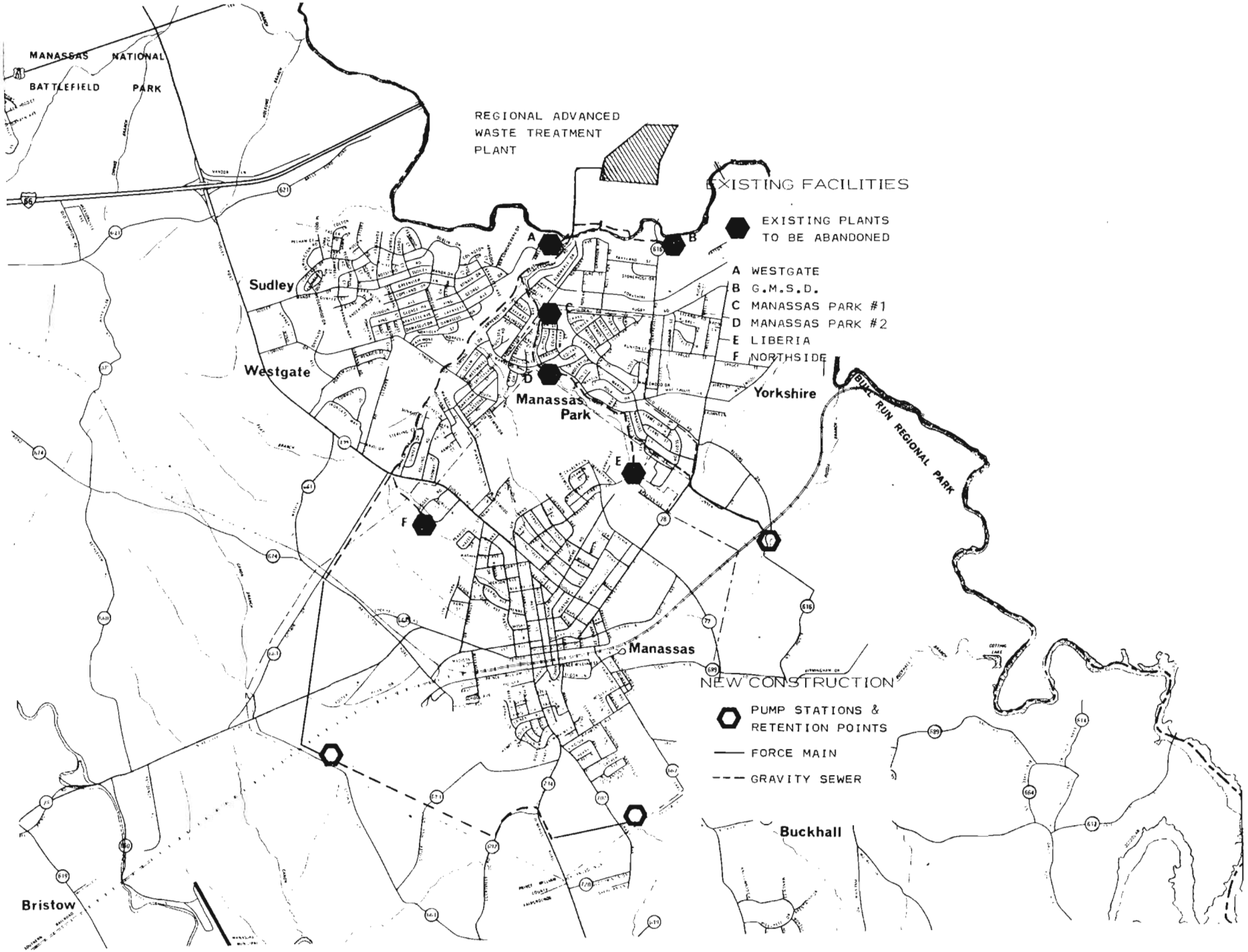


Plate 4

Therefore, when the Regional Plant opens, the State Water Control Board has stated that the maximum allowable limit (or certified flow) will be 10.9 mgd. The State Water Control Board has allotted this capacity in the following manner.

TABLE 8

REGIONAL PLANT AT STAGE 1

Fairfax County		3.36 mgd
Prince William County		
Prince William County	3.6 mgd	
Manassas Park	1.63 mgd	
Town of Manassas	2.31 mgd	7.54 mgd
	TOTAL	10.90 mgd

SOURCE: SERVICE AGREEMENT of May, 1972

The State Water Control Board has stated that if the plant proves itself effective after a years' operation, the redundancy factor may be lowered. In other words, by the 1976-1977 period, the State Water Control Board might allow the plant to be expanded to 15. mgd. The decision of whether to expand the plant or not must be agreed upon by the members of the Upper Occoquan Sewage Authority with the approval of each of the four governing bodies of the member jurisdictions. In March, 1972, the Chairman of the Upper Occoquan Sewage Authority received a memo from the State Water Control Board entitled Political Subdivision Capacity Allocations in U.O.S.A. Regional Water Reclamation Plant. At that time, the State Water Control Board presented two cases for allocation of the Regional Plant at 15 mgd. Table 9 illustrates these two cases.

TABLE 9

REGIONAL PLANT AT 15 MGD *A

Case 1 (exactly per State Water Control Board Policy of July 26, 1971)

Fairfax County			5.05 mgd
Loudoun County			.38 mgd
Prince William County B			
Prince William County	54%	5.13 mgd	
Manassas Park	11%	1.0 mgd	
Town of Manassas	35%	3.44 mgd	
			9.57 mgd
		TOTAL	15.00 mgd

Case 2 C

Fairfax County			3.36 mgd
Loudoun County			.38 mgd
Prince William County B			
Prince William County	54%	6.08 mgd	
Manassas Park	11%	1.24 mgd	
Town of Manassas	35%	3.94 mgd	
			11.26 mgd
		TOTAL	15.00 mgd

NOTES:

* These capacities are not projected flows but maximum allowable limits for each jurisdiction. Obviously, if a jurisdiction does not want this much capacity, it does not have to request the maximum limit and can request a lower capacity in U.O.S.A. Plant.

A. These are U.O.S.A. Plant Capacities; As indicated in the State Water Control Board Policy of July 26, 1971, a second regional plant will be permitted in the Upper Occoquan Basin. Accordingly, the capacity for such a plant will be in addition to that covered by these tables.

B. If one of the Prince William County jurisdictions does not want its maximum allowable limit and another Prince William County jurisdiction wants additional capacity, then the State Water Control Board will consider allowing the latter jurisdiction to be assigned the portion of the unwanted capacity of the other jurisdiction.

C. Which of these two cases is correct depends on Fairfax County's desires. Case "A" reflects maximum allowable to Fairfax County under the State Water Control Board Occoquan Policy. Case "B" reflects the conditions if 3.36 mgd is all Fairfax County wants for the foreseeable future as per their letter to UOSA of March 7, 1972. Fairfax should clarify which of these two cases it wishes.

Several months after this notification, the Service Agreement signed by the member jurisdictions allotted an initial capacity of 1.63 mgd to Manassas Park. Because of this action, the March notification allowing Manassas Park only 1 mgd when the plant expands to 15 mgd appears obsolete. Further investigation to determine future allotments by jurisdictions if the Plant expands to 15 mgd reveals that the State Water Control Board has not established firm allotments for these expansions. At best, Case 1 and Case 2 listed on Table 9 should be used as guidelines for long range planning purposes by individual member jurisdictions.

The Occoquan Policy has established a maximum allowable allotment of treated wastewater discharges within the Watershed between now and the 1985-90 time period. These allotments, shown below, form the basis for the sizing of the major interceptor lines of the regional interceptor system shown on Plate 4.

2. The Greater Manassas Sanitary District's Twenty Year Development Plan. During the early part of 1973, the Greater Manassas Sanitary District Advisory Committee presented the Board of County Supervisors a "Twenty Year Development Program for the Greater Manassas Sanitary District". The program's main objective was to outline a strategy which would enable the Sanitary

TABLE 10

TOTAL WASTEWATER DISCHARGES
ALLOWED UNDER THE OCCOQUAN POLICY
1985-1990

		% of Basin Allotment
Prince William County	20.5 mgd	52%
Fairfax County	13.2 mgd	34%
Loudoun County	1.0 mgd	2%
Fauquier County	4.6 mgd	12%
	39.3 mgd	100%

District to remain financially solvent without greatly burdening the residents of the Sanitary District. Although primarily a financial program, it does relate to future land use and capacity allocations within the Sanitary District and is most pertinent to this plan. The basic assumptions of the Twenty Year Plan are outlined below:

The proposed interim treatment plant will be available in mid-1973.

The Upper Occoquan Authority Treatment Plant will be open in mid-1975 and expansion as programmed in the agreement takes place in 1976, 1980, and 1985.

No provision has been considered for:

a. Marriot
b. Existing IBM capacity which will revert back to Sanitary District.
c. Capacity created by reduction of infiltration due to repairs to existing system as they are made.

d. Any reserve capacity in Upper Occoquan Sanitary Plant
e. Any reduction to flows due to water savers

It is felt by the Advisory Committee that the total additional capacity above as it is available could be used at the Board's discretion for Marriot, as a safety factor, for industrial rezoning, or any other use they deem feasible.

The growth in the Sanitary District is based only on land now zoned. It is assumed that very little, if any, rezoning will take place between now and 1995.

After presentation of the Plan, the Board of County Supervisors endorsed the proposed Twenty Year Plan for the Sanitary District shown on Table 11. Because the Sewer Plan covers only the 1973-1979 period, only the 1972-1980 period of Twenty Year Plan is shown on Table 11. The Board of County Supervisors also adopted the provision that it would make a commitment to the Sanitary District to use the Twenty Year Plan as input prior to any more rezoning within the District. Table 12 illustrates the sewer and water projections as well as the population projections of the Twenty Year Plan and compares them with future sewage allocations of the Upper Occoquan Sewage Authority Plant.

TABLE 11

SUMMARY OF TWENTY YEAR PLAN FOR
GREATER MANASSAS SANITARY DISTRICT
FOR 1972 - 1980 PERIOD

	Growth		Sewer Projections		
Fiscal Year 6/30	Equiv. Single Family Units	Approx. Accum. Pop.	Projected Annual Sewage Flow Gal/Day	Accum. Sewage Flow Gal/Day	Treatment Plant Capacity
1972	4,199	14,500		1,960,000	2,000,000
1973	4,982	16,178	313,000	2,273,000	3,300,000
1974	6,030	19,298	332,000	2,605,000	3,300,000
1975	6,746	21,099	236,000	2,841,000	3,300,000
1976	7,116	21,959	117,000	2,958,000	3,300,000
1977	7,449	22,819	105,000	3,063,000	4,660,000
1978	7,753	23,774	96,000	3,159,000	4,660,000
1979	8,057	24,729	96,000	3,255,000	4,660,000
1980	8,557	25,730	158,000	3,413,000	4,660,000

TABLE 12

SEWER & WATER PROJECTIONS vs UPPER OCCOQUAN CAPACITY*
FROM GREATER MANASSAS SANITARY DISTRICT TWENTY YEAR PROGRAM

Item	Equivalent Single Family Units	Estimated Population	Estimated Water Consumption Gal/Day	Estimated Sewage Flows Gal/Day	Upper Occoquan Sewer Capacity	Year Available
1. Existing Connections; schools under Constr.; No. Va. Comm. College	4,289	14,500	1,079,000	1,996,000		
2. Site Plans Approved; Tap Fees Paid	1,212	3,000	219,000	485,000		
Sub Totals	5,501	17,500	1,298,000	2,481,000		
3. Site Plans Approved; Tap Fees Not Paid	578	1,880	137,000	231,000		
Sub Totals	6,079	19,380	1,435,000	2,712,000		
4. Site Plans Approved since W & W Report	533	1,600	120,000	210,000		
Sub Totals	6,612	20,980	1,555,000	2,922,000		
5. Site Plans Filed Not Approved; Commercial & Residential	3,881	12,000	910,000	1,290,000	3,300,000	1975
Sub Totals	10,493	32,980	2,465,000	4,212,000	4,666,000	1976
6. Area Zoned; Site Plans not Filed; Industrial, Commercial & Residential	10,818	8,100	2,473,000	3,110,000	6,430,000	
TOTALS	21,311	41,080	4,938,000	7,332,000	10,500,000	1985

* Upon reviewing this Table the S.W.C.B. made the following observation: Table 12 shows 4.666 mgd capacity to be available in U.O.S.A. in 1976. However, it now appears that the U.O.S.A. plant will not be completed until late 1976 at the earliest. At the initial start-up of the U.O.S.A. plant, Prince William County will be allowed a maximum of 3.6 mgd. If sewage flows reach 4.212 mgd by 1976 as estimated in the Table, G.M.S.D. will not have sufficient capacity.

3. Summary of Existing and Projected Sewage Plans in Western Prince William County. Table 13 shows a summary of future sewage flows within the two major Sanitary Districts in western Prince William County. These flows are based on site plans submitted to the County. Nokesville Sewer District is omitted because of the small scale of its operation. The Towns of Manassas Park and Manassas are omitted because this site plan data was not available. Table 1 showed the existing sewage flows for all the major sewage treatment plants within Prince William County. It should be pointed out that the flows shown on Table 1 depict the average monthly flows for October, 1973. Due to a number of factors, the average monthly flows of a treatment plant often fluctuate from month to month. Flows during wet months will often be higher than months with long dry periods. This is due primarily to increased infiltration during the wet periods.

The Greater Manassas Sanitary District is currently expanding its treatment capabilities to 3.3 mgd. As shown on Table 13, the Sanitary District currently has approved site plans (committed capacity) for approximately .810 mgd.

Adding the District's current flow of 1.90 mgd (October, 1973) to the committed capacity of .810 mgd gives the Sanitary District an approximate additional .600 mgd before reaching 3.3 mgd. When the Upper Occoquan Sewage Authority's Regional Plant becomes operational, the Greater Manassas Sanitary District's allotment will be 3.3 mgd (of the total allotment of 3.6 mgd for Prince William County, .300 mgd has been reserved for the Yorkshire Sanitary District).

Presently, the Greater Manassas Sanitary District is working toward curbing their severe infiltration problems. Resolution of this problem should give the Sanitary District additional capacity. The Sanitary District is currently processing approximately .300 mgd of sewage for the Town of Manassas. Once the Regional Plant is completed, this flow will be charged against the Town's allocation.

The Town of Manassas currently treats approximately 1. mgd of sewage and is planning to expand its capabilities by .400 mgd before the Occoquan Plant opens. Its initial allotment in the Upper Occoquan Sewage Authority's Plant is 2.31 mgd. Manassas Park currently treats approximately 0.7 mgd. Its initial allotment in the Upper Occoquan plant will be 1.63 mgd. It should be obvious that capacity for significant growth in these two towns will be present upon the opening of the U.O.S.A. plant.

B. EASTERN PRINCE WILLIAM COUNTY

As discussed in Section I of the Comprehensive Plan, sewage treatment facilities in eastern Prince William County are currently provided by a number of organizations. These organizations include the Occoquan-Woodbridge Sanitary District, the Dumfries-Triangle Sanitary District, and the Dale Service Corporation.

1. The Potomac Regional Plant. Parts of eastern Prince William County are currently implementing a regional approach to wastewater treatment. This approach was initiated in 1963 when the Occoquan-Woodbridge Sanitary District had its consulting engineers develop a long-range sewer plan. This plan, updated in 1971, calls for the eventual phasing out of the four existing plants in the Occoquan-Woodbridge Sanitary District and the two existing plants in the Dumfries-Triangle Sanitary District, and the construction of one regional plant. Construction of the Potomac Plant is scheduled to begin in March of 1975 and be completed by July of 1978. Its initial capacity will be 12 mgd. It will be constructed to allow for future increments.

TABLE 13

SUMMARY OF FUTURE SEWER FLOWS IN GMSD AND YSD IN PRINCE WILLIAM COUNTY
(in million gallons per day)

	GMSD	YSD	Manassas Park
Existing Average Flow (Month of Sept., 1973)	1.880[f]	.136[a]	
Final Site Plans Approved but Not on Line	.810	.157[b]	.216[c]
Final Site Plans Pending	.580		
Preliminary Site Plans Pending	.655		
Possible Commitments Now Shown On Plans	e	.300[d]	
TOTAL FLOWS	3.935	.593	.216

Note: Estimated flows based on 400 gpd per residential tap in accordance with GMSD policy.

a. The Yorkshire Sanitary District has no sewage treatment facilities, so that the units which are currently generating .136 mgd of sewage within the YSD are having their sewage treated by the GMSD treatment facilities. Therefore, this .136 mgd is included within the 1.89 of existing flow in the GMSD, as well as in the total for the YSD.

b. Three hundred and twenty-two units (Stoneridge and Prince Cole Apts. located in YSD) which will soon generate approximately .157 mgd of sewage, will have their sewage treated at the GMSD facilities. Therefore, this .157 mgd of sewage is included within the .810 of approved site plans within the GMSD, as well as in the total for the YSD.

c. This .216 mgd of flow, generated by 2 projects within the Yorkshire Sanitary District (Manassas Park Village and Pinewood Park), will have their sewage treated by the sewage facilities of the Town of Manassas Park.

d. This .300 mgd of flow will be generated by the approximately 900 existing units within the Yorkshire Sanitary District which are presently not on public sewer. Because of the passage of a Bond Referendum, engineering work is currently underway on this project.

e. The amount of sewage promised to the Marriott Corporation in the letter of intent between the Board of County Supervisors and the Marriott Corporation has not been estimated here in that it is not yet known how much, if any capacity will be needed.

f. Based on County Executive's Office Performance Report #74-3 dated September, 1973.

g. The existing average flow shown on this chart is based on exceedingly low summer volumes which can be expected to increase dramatically during wetter months. A peak winter flow or average winter flow would be a better measure of available capacity.

Before plans for this plant were finalized, the Northern Virginia Planning District Commission staff studied the optional service areas for the Potomac Plant. The plan, entitled Water Quality Management Plan - The Northern Virginia Plan, was undertaken to satisfy federal requirements for grants. The study looked at a number of alternatives as to whom should be served by the Regional Plant. Cost/benefit analysis and other considerations indicated that the Regional Plant should initially just serve the Occoquan-Woodbridge and Dumfries-Triangle Sanitary Districts, and exclude the Lorton Prison Complex in Fairfax County and the Marine Corps Base at Quantico.

2. The Dale Service Corporation. Presently, the only major sewage treatment facilities in eastern Prince William County which are not planned to be phased out when the new Potomac Plant is operational are the two treatment plants operated by the Dale Service Corporation. These two package treatment plants serve the entire Dale Service Corporation franchise area. The boundaries of this area are identical to the boundaries of the Dale City Sanitary District shown on Plate 1. The two Dale City Plants are converting to tertiary treatment to meet the Embayment standards.

While each Dale Service plant is currently treating approximately ^{2}mgd, the Section 1 treatment plant has been certified by the State Water Control Board to expand to approximately ^{4}mgd. This expansion should be completed by 1974. The Section 8 treatment plant has been certified by the State Water Control Board to expand to a total of approximately 6 mgd. This expansion should be completed by 1978.

The Dale Service Corporation has programmed this additional capacity to accomodate future development of the Dale Service franchise area. The Northern Virginia Planning District Commission Water Quality Plan states that in the future, "it is envisioned that the Dale City Sanitary District will either operate the Dale Service plants or collect and transport the waste-water to the Potomac Plant". However, the Dale Service Corporation currently has no plans to relinquish the operation of these plants. The Dale Service Corporation presently has a request before the State Corporation Commission to expand its franchise area. In any event, it is clear that the Dale Service Corporation will have capabilities to permit continued rapid growth.

3. Summary of Existing and Future Sewer Flows in Eastern Prince William County. Table 14 summarizes future sewage flows of the major sewage facilities in eastern Prince William based on site plans submitted to the County. From Table 14, the Occoquan-Woodbridge Sanitary District has approximately .361 mgd of approved site plans which are not on line.

The Occoquan-Woodbridge Sanitary District has made contractual agreements with a number of large developers. These agreements have legally committed approximately 3.08 mgd of sewage. The Occoquan-Woodbridge Sanitary District has over 4 mgd on preliminary site plans.

When the State Water Control Board lifted its moratorium on the Occoquan-Woodbridge Sanitary District, it also approved a plan for the Sanitary District to provide interim capacity until the new Potomac Plant is operational. This interim plan approved by the State Water Control Board was presented to them by the consulting engineer of the Occoquan-Woodbridge Sanitary District in a report entitled Occoquan-Woodbridge Sanitary District Sewage Treatment Requirements Capability Feasibility. The interim plan approved by the State Water Control Board has been approved in stages. It allows for higher hydraulic flows through the Occoquan-Woodbridge Sanitary Districts but does not raise the level of pollutants that may be returned to the streams. Based on the engineer's report, it is anticipated that the

TABLE 14*

SUMMARY OF FUTURE SEWER FLOWS IN OWSD, DTSD, AND DCSD IN PRINCE WILLIAM COUNTY
(in million gallons per day)
(Based on 400 gpd per new residential tap)

	OWSD	DTSD	From DTSD to Neabsco Plant in OWSD	DCSD
Existing Average Flow	3.247[1]	.899[1]	N.A.	2.20
Final Plans Approved Not on Line	.361	.516	.666	.617
Final Plans Pending Approval	.602	.112	.065	1.912
Prel. Plans Pending Approval	4.456	1.411	.869	.714
Alleged Commitments Not Shown on Plans	.786	.040	.032	
TOTALS	9.452	2.978	1.632	5.443

[1] These flows are from the County Executive's Office - Performance Report #73-3 for the month of September, 1973. These flows include all the sewage coming to the OWSD plants and all the flows to the DTSD. Flows from the DTSD area which are flowing to the Neabsco Plant are not broken out in Performance Report #73-3.

Note: The existing average flows shown on this chart are based on exceedingly low summer volumes which can be expected to increase dramatically during wetter months. A peak winter flow or average winter flow would be a better measure of available capacity.

* The State Water Control Board made the following observations after reviewing Table 14. If the totals of the first three columns in Table 14 are added, the result is 14.062 mgd. The initial construction of the eastern Prince William County Regional Plant is expected to be a maximum of 12 mgd. Since no dates are given for the projections of 14.062 mgd, it is impossible to tell whether the capacity of the regional facility is expected to be exceeded even before it is built.

District will have an additional hydraulic capacity of 1.30 mgd by January, 1974 (making a total capacity of 4.85 mgd in the District) and additional 1.75 mgd by July, 1976, (making a total hydraulic capacity of 6.60 mgd for the Occoquan-Woodbridge Sanitary District before the Regional Plant is operational). Of the total 3.25 mgd interim capacity approved for the Occoquan-Woodbridge Sanitary District, as of May, 1974, only .430 mgd of this capacity was operational.

Table 1 shows the average flows in the Dumfries-Triangle Sanitary District are presently reaching their hydraulic capacity. This Sanitary District has currently committed .324 mgd through approved site plans. There are presently no plans to build additional interim capacity at the Dumfries Plant.

Since the publication of the draft Sewer and Water Facilities Plan, two proposals have been made to provide interim treatment capacity in the Dumfries-Triangle Sanitary District. The firm of EMC, Inc. has proposed to build an interim expansion of from 2 mgd to 2.8 mgd to the Dumfries Sewage Treatment Plant. The Board of County Supervisors approved this proposal on June 4, 1974. The proposal must still be approved by the State Water Control Board. This interim capacity would be phased out when the flows from the Dumfries-Triangle Sanitary District are conveyed to the new Potomac Regional Plant.

C. CONCLUSIONS CONCERNING WASTE-WATER TREATMENT PROGRAMS (1974-1979)

This section of the report has reviewed the relevant major sewage treatment organizations within the County. It has outlined the existing hydraulic flows as well as the "interim capacity" expected in both the eastern and western sections of the County prior to the opening of the Upper Occoquan Sewage Authority Plant and the Potomac Regional Plant. At this point, some generalizations and conclusions can be made concerning wastewater treatment programs for the 1974-1979 period.

1. Both eastern and western Prince William County are implementing "Regional" approaches to wastewater treatment. These regional plants will provide a high level of treatment which will meet the standards enforced by the State Water Control Board. Unlike earlier sewage treatment facilities within the County, implementation of both plants will rely heavily on Federal funding.

2. Until the Upper Occoquan Sewage Authority Plant expands to 15 mgd (1977-78), the Greater Manassas Sanitary District will have a minimal amount of capacity to allocate after all the commitments (.810 mgd of approved site plans) are brought on line.

3. Although the Town of Manassas Park's treatment plants are currently at capacity, once the Upper Occoquan Sewage Authority's Plant is operational the Town will have additional capacity to allocate.

4. The Town of Manassas is currently approaching its certified limits of .938 mgd. When the Upper Occoquan Plant is operational, the Town will have 2.31 mgd alloted in its initial allocation.

5. The Dale Service Corporation is presently one of the few sewage utilities in the County with sewage capacity. With its approved expansion to 10 mgd, it can be assumed that the Dale Service Corporation will be able to provide sewage treatment capability for the Dale City RPC and the other areas of the Dale Service Franchise Area. This reserve capacity allows for a population equivalent of approximately 60,000 people.

6. The Occoquan-Woodbridge Sanitary District and the Dumfries-Triangle Sanitary District will phase out their existing treatment plants when the 12 mgd Potomac Treatment Plant is operational (mid-1978). When the Potomac Plant opens,

approximately 8.4 mgd of wastewater will need to be treated immediately, if the Occoquan-Woodbridge Sanitary District uses all its existing and planned interim expansion (3.25 mgd) and the Dumfries-Triangle Sanitary District is treating 1.25 mgd by mid-1976. If the EMC, Inc., expansion is accomplished in the Dumfries-Triangle Sanitary District, flows from the Dumfries-Triangle Sanitary District to the Potomac Regional Plant could be between 3.25 mgd and 4.05 mgd.

7. If the Occoquan-Woodbridge Sanitary District plants meet the water quality standards of the State Water Control Board and are allowed interim capacity of over 3.25 mgd, it will mean an additional 8,000 - 9,000 connections (units) prior to the opening of the Potomac Regional Plant. Presently, the Occoquan-Woodbridge Sanitary District has 11,632 connections. To put this in another way, by practically doubling the sewage treatment capacity of the Occoquan-Woodbridge Sanitary District between 1974 and 1976, it is possible that the existing population in the Occoquan-Woodbridge Sanitary District will double by 1976-1977.

As made clear at the beginning of this report, one of the underlying goals of the Sewer and Water Facilities Plan is to "utilize water and sewer facilities as a tool for shaping the direction, extent and timing of urban development". The type of urban development sought by the County is "balanced growth".

1. Areas to be Served by Sewage Facilities - Next Five Years - In Prince William County's case, balanced growth means higher concentration of industrial, commercial and other employment land uses than presently found in the County. To realize this and the other sewer service objectives already outlined at the beginning of this report, the following five year program is recommended.

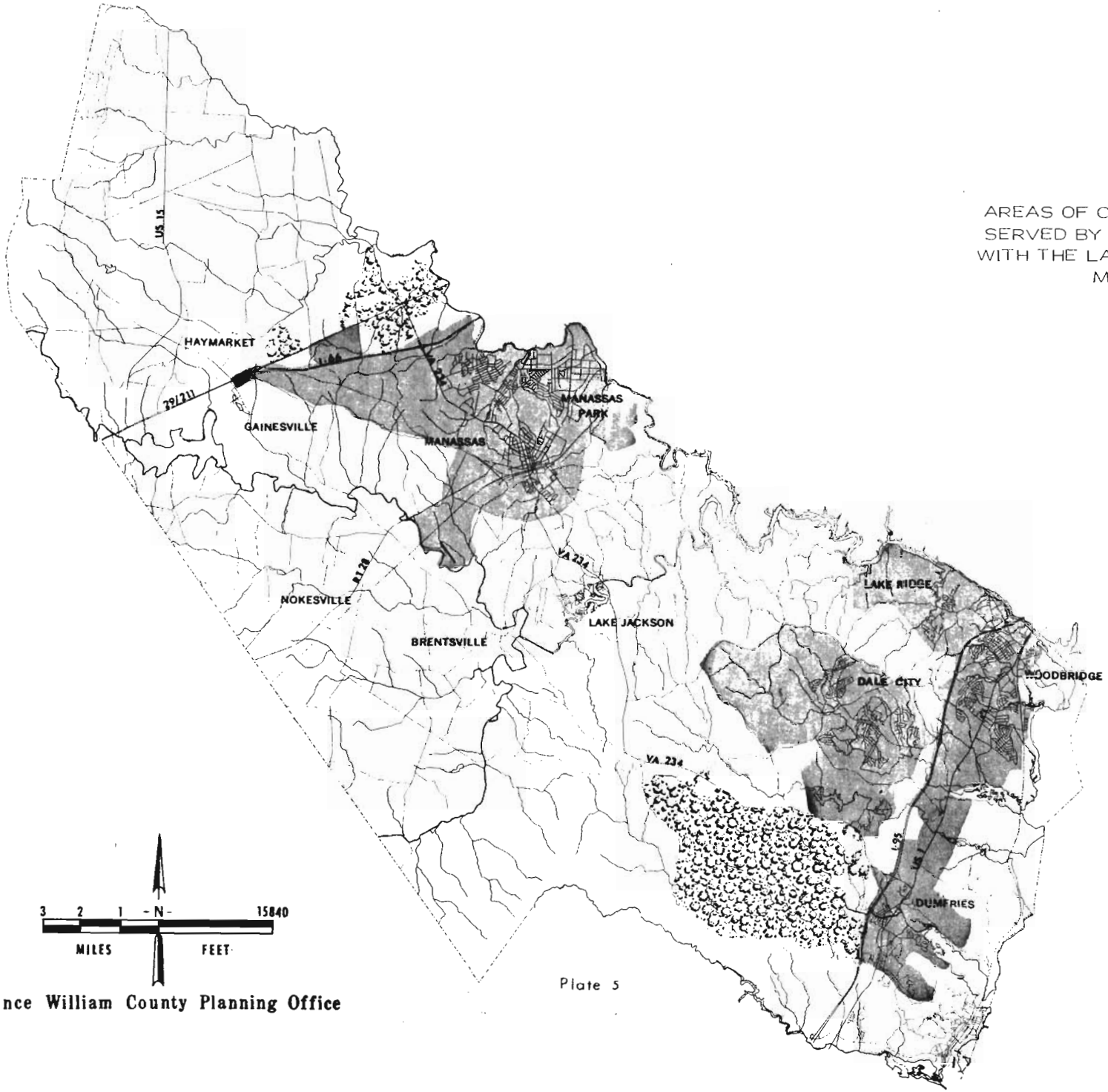
First, Platè 5 shows the areas of the County which ought to be served by centralized sewage (and water) facilities during the next five year period. Any extension of sewer service during the next five years into areas other than those outlined in Plate 5 would be premature. Most of the areas shown in Plate 5 are currently within Sanitary Districts. The major exception is the Industrial Complex areas in western Prince William County. The County must continue to seek the needed mechanisms to provide water and sewage services to this area.

Second, all the County's Sanitary Districts should ascertain that their Capital Improvements Program for the next five years reflect the constraints shown by Plate 5. By restricting sewage facilities to the areas shown on Plate 5, and by adhering closely to the Sewage Allocation Policy adopted by the Board of County Supervisors, the County will make substantial progress to realize the Objectives outlined at the beginning of this report.

2. Population to be Served During the 1974-1979 Period - In 1973, the County had a population of approximately 142,000. Approximately sixty percent of 85,600 people lived east of the Occoquan River. The remainder (57,120) lived west of this river. In 1973, approximately 16% of the County's population lived outside the boundaries of Sanitary Districts or in incorporated jurisdictions. The report has already outlined the existing sewage flows and projected interim capacity for Sanitary Districts and incorporated jurisdictions within eastern and western Prince William County. Using this information, the report will forecast possible population for the 1974-1979 period based on sewage capacity.

In eastern Prince William, the Occoquan-Woodbridge Sanitary District has programmed approximately 3.25 mgd to come on line before the Potomac Plant is operational. Based on a standard of four hundred gallons per unit per day, this would allow for approximately 8,000 units (households).

AREAS OF COUNTY PROJECTED TO BE SERVED BY SEWER IN CONFORMANCE WITH THE LAND DEVELOPMENT POLICY MAP, 1974 - 1980



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MILES FEET

Prince William County Planning Office

Plate 5

Employing four people per unit, this would be an equivalent population increase of 32,000. After the Potomac Plant becomes operational (1978) an additional capacity will become available for use by both the Occoquan-Woodbridge and Dumfries-Triangle Sanitary Districts.

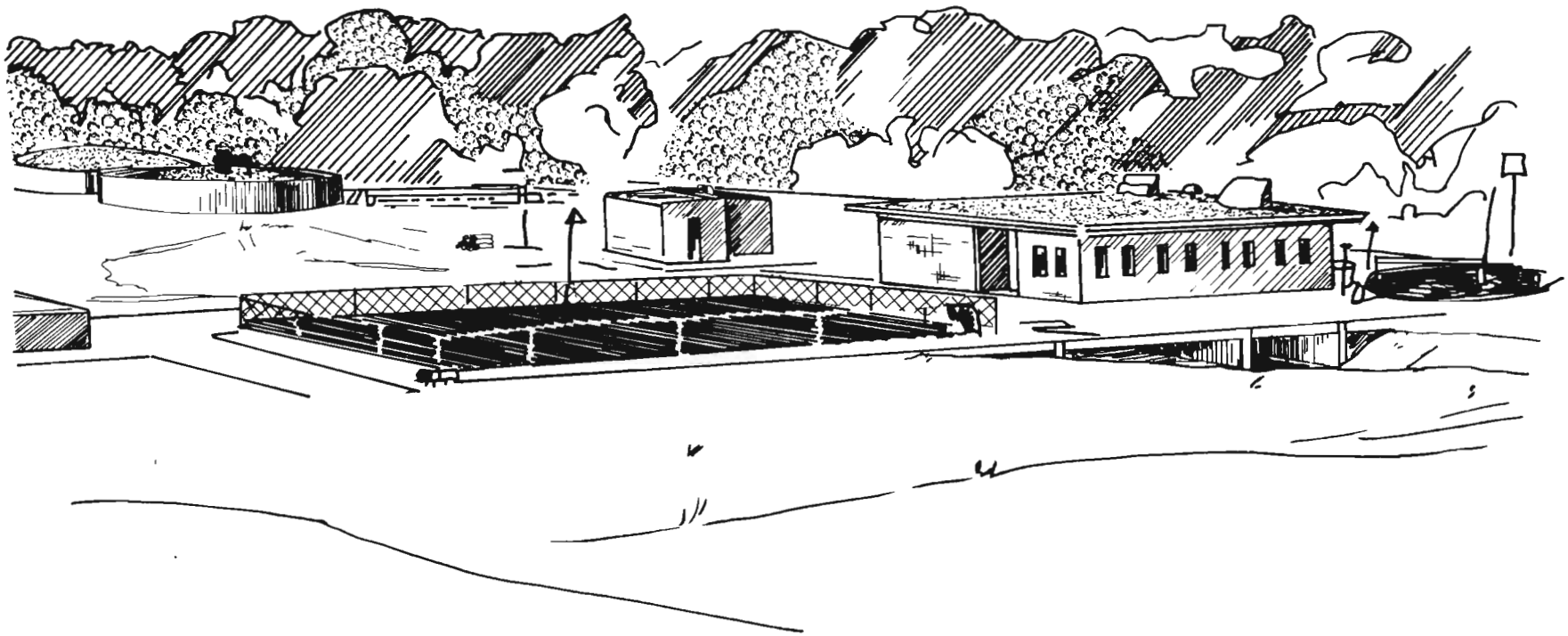
The Dale Service Corporation is currently increasing its certified capacity of 4 mgd to 6 mgd to 10 mgd. The Hylton Corporation (developer of Dale City) has averaged approximately 1,000 housing units per year. At the current building rates, the additional 6 mgd could serve the Dale Service Area for fifteen years. By 1978, the population increase would be approximately 20,000. Without accounting for the increased capacity which will become available after the Potomac Plant becomes operational (1977 - 1978), the population equivalents forecast in eastern Prince William County by 1978 is 51,000. This population increase does not take into account any population growth which occurs outside the boundaries of Sanitary Districts or incorporated jurisdictions in eastern Prince William County.

In western Prince William County, the Greater Manassas Sanitary District has approximately 1.3 mgd of capacity which is not being utilized. This should be totally allocated by the opening of the Upper Occoquan Sewage Authority Plant (1975-1976). Based on four hundred gallons per unit per day, this will allow for approximately 3,250 residential units and a population increase of approximately 14,000. The Town of Manassas Park's treatment plants are currently at hydraulic capacity as are the treatment plants in the Town of Manassas. The Town of Manassas is currently expanding their Northside plant by approximately .400 mgd. This will serve an additional equivalent population of 4,000. Therefore, before the Upper Occoquan Sewage Authority's Regional Plant becomes operational (1975-1976) a population increase of approximately 18,000 people can be forecast for the western Prince William area. This population increase does not include any growth occurring outside of existing Sanitary Districts and incorporated jurisdictions in western Prince William County.

When the Upper Occoquan's Regional Plant opens (1975-1976), the Town of Manassas Park's initial allocation will be 1.63 mgd, 1 mgd above its present capacity. This will allow for an equivalent population increase of 10,000. When the Regional Plant opens (1975-1976), the Town of Manassas' initial allocation will be 2.31 mgd. However, as already outlined, the Greater Manassas Sanitary District is currently processing approximately .300 mgd for the Town. This will be charged against the Town when the Upper Occoquan Plant is operational. After accounting for the Town of Manassas existing flow (.900) as well as interim expansion (.400), the Towns' net increase when the Upper Occoquan Plant opens is approximately .600 mgd. This will allow for an equivalent population increase of 6000 by 1975-1976. When the Upper Occoquan Plant is operational, the County will gain the .300 mgd capacity allowing for a population increase of 2,800.

Under the terms of the Occoquan Watershed Policy, the Regional Plant must operate successfully for at least a year before its capacity can be expanded. Because of this, it will be at least the 1977-1978 period before either Prince William County, Manassas Park or Manassas will get any additional capacity. Without accounting for increased capacity which might become available when the second stage of the Upper Occoquan Plant is operational (1977-1978), the population equivalent forecast in western Prince William County by 1977-1978 is 36,800. This figure does not include development outside of Sanitary Districts and incorporated jurisdictions of western Prince William County.

From the above analysis, it has been shown that if all the programmed expansions occur, an equivalent population increase of 87,800 is possible by 1977-1978. As already made clear, this population would not include any future development that might occur in areas outside of the boundaries of Sanitary Districts or incorporated jurisdictions. This population increase would also not include any future development which might occur in Sanitary Districts without sewage treatment capabilities (i.e., Gainesville-Haymarket Sanitary District). To project this population, the assumption has been made that all the sewage capacity would be for residential uses. However, under the County's adopted Sewage Allocation Policy, sewage capacity is reserved for commercial, industrial and public uses as well as for residential uses. If this policy is adhered to, actual population increases by 1978 will be well below the forecast equivalent population cited above. Therefore, the population equivalents cited above should be used as the population parameters which could possibly occur if the County did not implement its sewage allocation policy.



3 *The Water Element*

The third section of the plan will present a short range (1974-1979) water plan as well as outlining some longer range water programs for the County. Section I of the Comprehensive Plan outlined the water facilities currently in Prince William County. Data presented on these facilities included the feet of water lines and storage facilities by the major water suppliers in Prince William County. Section I of the Comprehensive Plan briefly described some of the planning that has been undertaken concerning future water supplies in Prince William County. Section I of the Comprehensive Plan concluded that a definite need still exists for the County to come to grips with its future water supply problem. To help further define this need, the Water Element will examine in depth the following subjects.

First, the Water Element will examine the present water consumption within Prince William County. Second, the present sources of water in Prince William County will be examined including any problems which may be involved with each source. Then, the Water Element will discuss historical studies and other recommendations for potential surface water supplies for Prince William County. Next, the Water Element will outline the County's role in Metropolitan Washington's future water supply. To ascertain future water needs, the Water Element will then project future water consumption in Prince William County. Lastly, the Water Element will propose a short range as well as a long range plan for securing future water supplies for Prince William County.

A. PRESENT WATER CONSUMPTION IN PRINCE WILLIAM COUNTY

Table 15 outlines the approximate number of gallons of water consumed by the major public and private water systems in Prince William County.

Although there are several other water systems within the County (Independent Hill, Lakeview Estates, and Bull Run Mt. Estates), these systems use insignificant amounts of water and they are not expected to increase their consumption in the future. Table 15 does not show the amount of water presently being consumed by residential units, businesses, and public buildings which utilize their own onsite wells. In general, these cases are found in the rural areas of the County where public or private water systems are not available.

According to the 1970 census, eighty-three percent (83%) of the County occupied housing units (22,969) were on a public or private water system. The 1970 census listed sixteen percent (16%), (4,555) occupied housing units employing wells. Less than one percent (1%), (236 occupied units) were listed in the "other" category. This category is defined as "spring, creek, or river and all other sources". Employing the 1970 census percentages, it can be assumed that of the 1973 County population of 142,000, approximately sixteen percent (16%) or 22,720 people utilized their own wells. If one employs a per capita consumption rate of 80 gallons of water per capita per day, this would mean that approximately 1,817,600 gallons of groundwater are consumed through individual wells per day. In summary, by adding the total water consumed from Table 1 as well as adding the water consumed through individual wells, total County average daily consumption of water in 1973 was approximately 10,890,317 gallons per day.

B. PRESENT SOURCES OF WATER FOR EASTERN PRINCE WILLIAM COUNTY

Presently, in eastern Prince William County, the source of all water (excluding groundwater from individual wells) is the Occoquan Reservoir. All water from this reservoir is purchased from the Fairfax County Water Authority on a wholesale basis by the Occoquan-Woodbridge Sanitary District, the Dumfries-Triangle Sanitary District, and the Prince William Water Company (a private utility franchised to serve the Dale City area). Each of these organizations then retails the water to its customers through their own water lines. Data on the Occoquan Reservoir and the Fairfax County Water Authority's Treatment Plant at Occoquan is presented on Table 16.

TABLE 15

PRESENT CONSUMPTION OF WATER[2] BY

MAJOR WATER SYSTEMS IN PRINCE WILLIAM COUNTY

Public or Private Water System	% of Water Consumed by Residential Uses	Total Average Daily Water Consumption in mgd[1]
O.W.S.D.	92	3,051,648
D.T.S.D.	80	763,250
G.M.S.D.	73	1,527,819
Y.S.D.	N.A.	200,000
Manassas	N.A.	1,400,000
Manassas Park	N.A.	410,000
Prince William Water Company	N.A.	1,650,000
	TOTAL	9,002,717

1 These daily averages based on data for the first half of 1973.

2 Water consumption shown on Table 15 is primarily based on the billing records of each water system. Unmetered water such as water loss through leakage, or water utilized in fire fighting is not reflected in Table 15. Therefore, total consumption within the County is probably 5 to 10% higher than Table 15.

TABLE 16

DATA ON OCCOQUAN RESERVOIR AND FAIRFAX COUNTY WATER AUTHORITY TREATMENT PLANT

A.	Reservoir Capacity	
1.	Present usable storage	9.2 billion gallons
2.	Present annual safe yield	65 mgd
3.	Annual safe yield with dam height increased 5 feet (study underway to determine if dam height can be increased)	84 mgd
4.	Present 7-day yield using raw water storage (assuming no limitations on withdrawal)	222.6 mgd
B.	Water Treatment Plant Capacity - F.C.W.A.'s Occoquan Plant	
1.	Annual safe capacity -	
	Design	62 mgd
	Actual	93 mgd
2.	Peak treatment capacity (7 days)	100 mgd

In 1973, the three major water providers in eastern Prince William County mentioned above purchased a combined average of 7 mgd.

1. Contractual Agreements with Fairfax County Water Authority. The Occoquan-Woodbridge Sanitary District and the Dumfries-Triangle Sanitary District have a contract with the Fairfax County Water Authority which expires in 1992. The contract states that "the County hereby agrees to purchase from the Company, in accordance with the terms of this agreement, all water required to serve the present and future residents of the Occoquan-Woodbridge Sanitary District and the Dumfries-Triangle Sanitary District". The contract also states that the County agrees to the fact that it will not permit its pipes or service lines and piping of its customers to be connected in any way with the pipelines of any other source of water. Authorities within Prince William County are currently studying the possibility of negotiating a new contract with the Fairfax County Water Authority.

According to the Engineer - Director of the Fairfax County Water Authority, the Authority assumes that it will be requested to provide all the water which may reasonably be required in the Dale City, Occoquan-Woodbridge, and the Dumfries-Triangle Sanitary Districts' service areas in future years. The Authority's estimates of these requirements are outlined in Table 17.

TABLE 17

WATER REQUIREMENTS FOR EASTERN PRINCE WILLIAM COUNTY FROM FAIRFAX COUNTY WATER AUTHORITY

Year	Average Daily Demand in Million Gallons
1980	12.5
1990	20.4
2000	29.3
2010	41.2

The Water Authority based its projections on population forecasts made for the Metropolitan Council of Governments by the consulting firm of Hammer, Greene, Siles in 1968. In correspondence concerning future water supplies, the Engineer-Director of the Fairfax County Water Authority stated that "our ability to supply the increasing needs of these areas will require substantial capital outlays for additional facilities; and Prince William Water Company and/or Prince William County will be expected to assume a proper share of these financial burdens".

2. Future Sources of Water for Fairfax Water Authority. The Fairfax County Water Authority recently applied to the State of Maryland for a permit to withdraw 32 million gallons of water a day from the Potomac River. The Maryland Depart-

ment of Water Resources has authority for allocating Potomac water to Washington area jurisdictions. The Maryland Department of Water Resources has granted permission to the Fairfax County Water Authority to withdraw an average of 15 mgd from the Potomac River. The FCWA is proposing to build a new water treatment plant to be located on the Virginia shoreline of the Potomac at approximately the boundaries of Loudoun and Fairfax Counties. It would lie opposite the mouth of Seneca Creek. When the Potomac becomes a source of water for the Fairfax County Water Authority, a large percentage of the Occoquan Reservoir will become available for use of Prince William County and the central and southern portions of Fairfax County.

3. Contractual Agreements of the Prince William Water Company. The Prince William Water Company presently has a contract with the Fairfax County Water Authority which expires in the 1990's. This contract states that the Occoquan Reservoir will provide water for whatever the needs of the Prince William Water Company franchise area until the contract's expiration date.

4. Future Sources of Water for Virginia-American Water Company. The Virginia-American Water Company, which is the parent company of the Prince William Water Company, has been granted approval by the Corps of Engineers to withdraw 40 million gallons of water a day from the Potomac River through the Corps of Engineers Dalecarlia Treatment Plant above Washington, D. C. (The company is now negotiating rights-of-way for its pipeline through Washington to Alexandria.) Currently the Virginia-American Water Company serves the City of Alexandria with 12 million gallons of water per day. Source of this water is the Occoquan Reservoir. Once the Virginia-America Water Company withdraws water from the Potomac, the 12 mgd of water going to serve Alexandria will come from the Potomac River and not the Occoquan Reservoir. This will also increase the amount of water available to southern Fairfax County and Prince William County from the Occoquan Reservoir.

C. PRESENT SOURCES OF WATER IN WESTERN PRINCE WILLIAM COUNTY

1. Groundwater Sources - In western Prince William County, there are a number of sources of water. The Greater Manassas Sanitary District's primary source is groundwater, obtained from seven deep wells, capable of supplying an estimated maximum of 2 mgd. In a report done for the Greater Manassas Sanitary District in 1972, its consulting engineers stated that although the wells were currently providing adequate water, the water is hard, the water table is dropping and the future adequacy of wells as the District's water source is "questionable". The wells are currently operating near capacity.

   The Greater Manassas Sanitary District also buys some water wholesale from the Town of Manassas and the Fairfax County Water Authority. The Sanitary District does not have long term contracts for water from either of these sources but negotiations with both are currently underway. Water from the Fairfax County Water Authority is piped to the Greater Manassas Sanitary District through a sixteen inch line from Centreville. The District currently receives about one half million gallons of water a day through the Fairfax County Water Authority line. Both the Yorkshire Sanitary District and the Town of Manassas Park utilize ground water supplies through deep wells within their jurisdictions.

2. Broad Run Impoundment - The only surface water supply located in western Prince William County is the Broad Run Reservoir, owned and utilized by the Town of Manassas. Information on this reservoir and treatment plant is shown on Table 18.

TABLE 18

DATA ON TOWN OF MANASSAS, VIRGINIA
RESERVOIR AND TREATMENT PLANT

Broad Run Reservoir on Broad Run

A.	Reservoir capacity	
1.	Present usable storage	5.0 billion gallons
2.	Annual safe yield	8.0 mgd
3.	Present 7-day yeild using raw water storage (assuming no limitations on withdrawal)	121.0 mgd
B.	Water Treatment Plant Capacity - Manassas Treatment Plant	
1.	Annual safe capacity	4.0 mgd
2.	Peak capacity (7 days) estimated	6.0 mgd

As shown on Table 15, the Town currently consumes approximately one and one half million gallons per day from this reservoir.

In March of 1973, the Mayor of Manassas stated that if needed, the Town could raise the center of the Dam, secure additional flood plain, thereby increasing the reservoir's capability to 17 - 20 mgd.

3. Problems with Reliance on Groundwater - As outlined above, groundwater is the primary source of water in most of western Prince William County. As this report has already illustrated, the consulting engineers of the Greater Manassas Sanitary District have questioned the future adequacy of wells as the District's water source. The Virginia Division of Mineral Resources has previously indicated that the interior of Prince William County is underlain by igneous, sedimentary and metamorphic rocks. The Division of Mineral Resources goes on to point out that there is abundant evidence that underground sources for wells is not a dependable means of acquiring large quantities of water. The fact that most of western Prince William County relies on underground water takes on increased significance since the State of Virginia passed the Groundwater Act of 1973. This legislation gives the State the authority to take ownership of underground water and decide who will and who won't get water in areas of critical shortages. Under the Act, an area facing depletion of its water resources can be designated a critical area whereby the State Water Control Board and the Health Department control all water withdrawal and construction of new wells and determine who will and who won't get water.

Groundwater relies on aquife recharge areas as one means of replenishing its supply. Areas undergoing urban development will often inadvertently destroy these recharge areas. For the reasons above, it is increasingly incumbent upon Prince William County to look for surface water supplies to replace its dependence upon groundwater.

D. HISTORICAL STUDIES ON POTENTIAL SURFACE WATER SUPPLIES FOR PRINCE WILLIAM COUNTY

1. 1966 Wiley & Wilson Report - Since the mid-1960's, Prince William County has undertaken a number of studies on future water supplies. In a study done by the consulting firm of Wiley & Wilson in 1966, it was projected that the County's water needs would be 46 mgd by the year 2000.

This water was projected to serve a population of 298,000, excluding Quantico Marine Corps Base. To arrive at this water consumption, Wiley and Wilson employed 160 gallons per capita per day.

The 1966 Wiley and Wilson Report studied a number of possible impoundment sites within Prince William. The major impoundment sites studied are shown on Table 19. Their locations are

TABLE 19

PRINCE WILLIAM COUNTY WATER SUPPLY REPORT

Comparison of Principal Reservoir Sites

	Broad Run at Brentsville	Broad Run Below Gainesville	Broad Run Above Buckland	Kettle Run At Route 28	Cedar Run At Brentsville
Water Shed Square Miles	145	60	50	19	197
Minimum Daily Flow MGD	0.064	0.23	0.194	0.032	0.087
Minimum 30 Day Flow MGD	0.153	2.38	1.99	0.249	0.208
Minimum Yearly Flow MGD	23.4	9.7	8.1	3.30	31.9
Average Daily Flow MGD	84.6	36.2	30.3	11.3	115.0
Normal Water Level Stream Elevation	148(1)	216.4	303.2	199	148.1(1)
Proposed Spillway Level Elevation	180	267	350.0	236	180.0
Proposed Flood Level Elevation	185	272	355.0	241	186.0
Flooded Area at Spillway, Acres	1,660	950	360	390	2,760
Flooded Area at Flood, Acres	2,100	1,150	450	475	3,200
Type of Dam	Mass Conc.	Mass Conc.	Mass Conc.	Earth	Mass Conc (2)
Estimated Cost	$2,920,000	$1,850,000	$1,700,000		$4,850,000
Estimated Storage, Million Gallons	7,900	5,900	2,100	1,950	12,700
Safe Average Yield, MGD	28	18.0	14.0	7.0	60.0
Cost Per Million Gallon Storage	$ 370	$314	$810		$380
Cost Per Million Yield	$10,420	$10,250	$12,150		$9,000

(1) Elevation when surveyed December, 1965. Lake Jackson Backwater Elevation is normally 153 (U.S.G.S. Maps)

(2) Estimate based on mass concrete, but in final design compacted earth may be possible if spillway area can be developed at more favorable cost.

SOURCE: "A Comprehensive Report on Future Water Supply for Prince William County" Wiley & Wilson, Consulting Engineers 1966

shown on Plate 6. The report described the County's acquisition of the property and rights to Lake Jackson. This lake was created by a dam located immediately above the Occoquan Creek crossing of Route 234. The report states that Lake Jackson has an estimated storage capacity of approximately 400,000,000 gallons after allowance for silt in the reservoir. The report estimated that under normal conditions the lake would have a safe yield of approximately 5 mgd and, combined with that available from storage, a dependable yield of approximately 6 million gallons per day. After studying all the impoundment sites listed, the Wiley and Wilson report selected the Lake Jackson-Cedar Run-Brentsville reservoir combination as the most feasible future water source, but the report also spoke of the potential of the Salem Church Dam.

To quote the 1966 Wiley and Wilson Study:

> "The County is fortunate in having acquired the Lake Jackson property which can become the initial source of a general county system with lines originating near the practical center of the County and radiating in various directions to the customer area with the minimum size pipe lines and distances. Lake Jackson is also the base upon which a large impoundment having a capacity of approximately 12.7 billion gallons of water can be developed which in turn can be supplemented by the Salem Church Reservoir. The Salem Church project must, sooner or later, be developed and will certainly be developed within the time at which such supply is neede by Prince William County to supplement the Occoquan source."

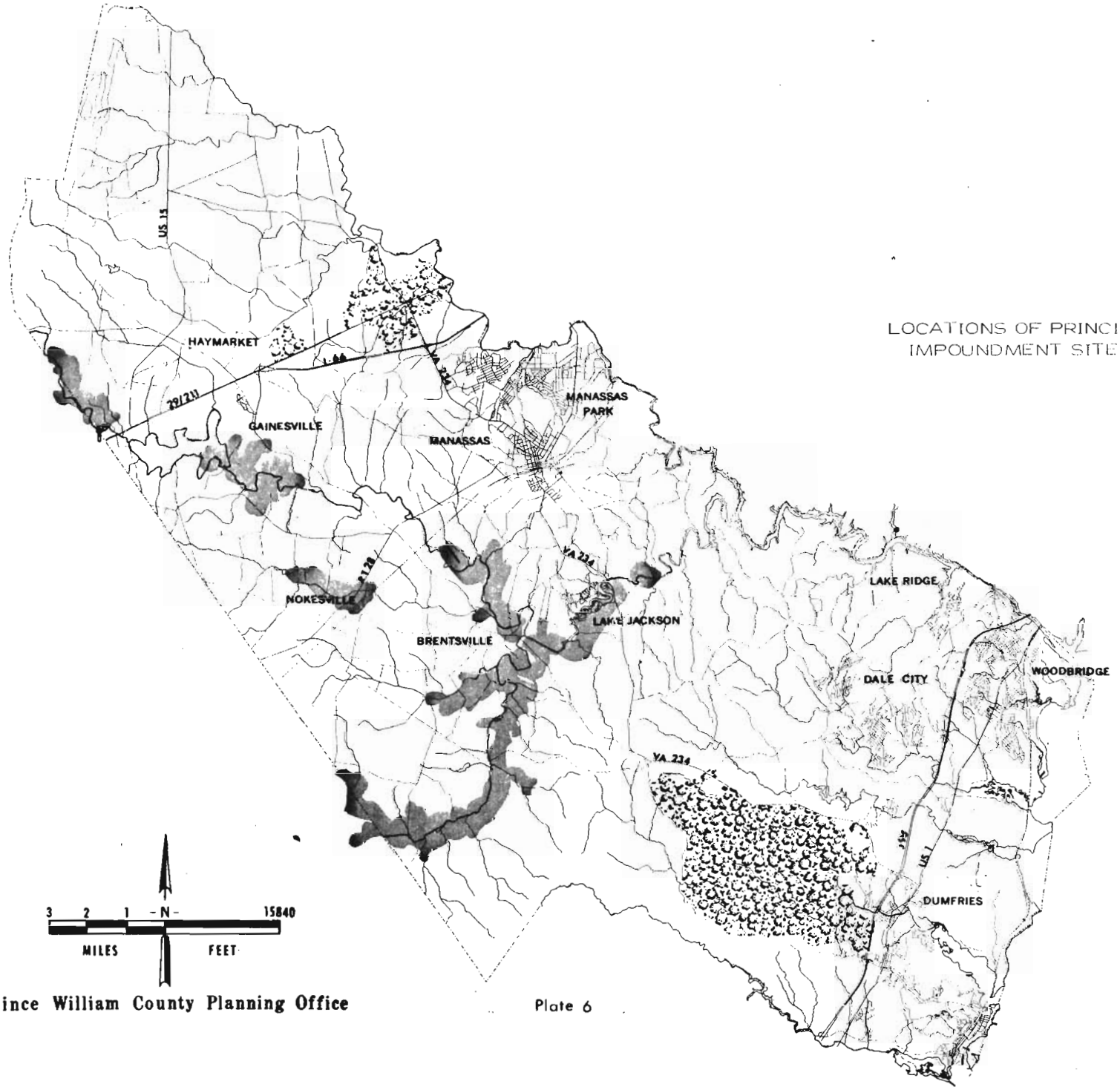
2. 1968 Wiley and Wiley Report - The 1966 Wiley and Wilson Report was updated in 1968. After publication of the 1966 Report, the Town of Manassas decided to proceed with plans to develop their own impoundment on Broad Run. Previous to this decision, efforts were made for the Town of Manassas and the County to join forces to supply water. Once the Town's decision to seek their own supply on Broad Run was made, the County (Fall, 1967) attempted to form a utilities authority to supply water but the County Board of Supervisors was divided on the matter and, after an advisory referendum showed the people were against the authority, it was not pursued further. The 1968 Wiley and Wilson report projected the County's long term water needs. These results are shown on Table 20.

The 1968 Wiley and Wilson report stated that the County "does not have adequate plans to provide its ever-growing population with the water they will require". The report went on to point out that the County has inadequate provisions for the expansion of required waterwork facilities. It concluded "Separate uncoordinated systems for the most part serve the County's growth centers".

The report recommended that the County form a County-wide water system. The report recommended that the County-wide system could best be administered by a water authority whose members would represent the various Towns and Sanitary Districts that are authority customers.

The 1968 Wiley and Wilson Report recommended that the County implement the following program for future water supplies:

(a) If certain legal questions concerning the requirements for downstream release, as stated in Title 62 of the Code of Virginia, are answered favorably, then it is recommended that the Authority offer to purchase the Town of Manassas' interest in their Broad Run development near Buckland, use this site as the Authority's initial supply, and invite Manassas to be represented on the authority.



Prince William County Planning Office

Plate 6

TABLE 20

ESTIMATED POPULATION, CUSTOMERS AND WATER CONSUMPTION

Area System	1968	1970	1975	1980	1985	1990	1995	2000
1. Lake Jackson-Greater Manassas Yorkshire		50	1,400	2,400	4,200	4,900	7,700	9,450
2. Greater Manassas Sanitary District	2,268	2,410	3,480	4,050	4,600	5,400	5,900	6,300
3. Yorkshire Sanitary District	911	1,250	1,500	1,650	1,800	2,080	2,260	2,450
4. Gainesville-Haymarket S.D.		200	420	680	840	1,000	1,150	1,300
5. Occoquan-Woodbridge S. D. (1)							16,700	18,100
6. Dumfries-Triangle S.D.				2,335	3,075	3,725	4,325	4,850
7. Dale City (1)							8,000	8,000
8. Nokesville-Route 28-Broad Run			180	320	470	630	800	960
9. Lake Jackson-Independent Hill-Hoadly			210	860	1,600	2,350	3,100	4,050
10. Independent Hill-Dumfries			1,070	3,390	4,400	5,650	6,900	8,390
11. TOTAL CUSTOMERS	3,179	3,910	8,260	15,685	20,985	25,735	56,835	63,850
12. Persons per connection (2)	3.85	3.85	3.85	3.85	3.85	3.80	3.80	3.80
13. Population equivalent	12,240	15,054	31,801	60,387	80,792	97,793	215,973	242,630
14. Water Use - Gals. per capita per day	100	110	130	140	145	150	155	160
15. Total: Million Gals. per day	1.22	1.66	4.13	8.45	12.71	14.67	33.48	38.82
16. Total County population (3)	101,000	110,000	142,000	180,000	216,000	255,000	292,000	310,000
17. Total Potential Water Need MGD	10.1	12.1	18.2	25.2	31.3	38.2	45.3	49.6
18. Town of Manassas-Water Connections	2,799	3,482	5,989	6,741	7,481	8,090	8,658	9,177
19. Town of Manassas Park-Wtr.Connect.	1,595	1,600	1,600	1,600	1,600	1,600	1,600	1,600
20. Total Connections	4,394	5,082	6,689	8,341	9,081	9,690	10,258	10,777
21. Households Served	5,055	5,844	7,692	9,592	10,443	11,143	11,797	12,393
22. Persons per household	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
23. Equivalent Population	17,692	20,454	26,923	33,571	36,552	39,000	41,290	43,375
24. Water Use-Gallons per cap./day	100	110	130	140	145	150	155	160
25. Total Water Use-Million Gal./day	1.77	2.25	3.50	4.70	5.30	5.85	6.40	6.94
Total County Water Requirement MGD (4)	2.99	3.81	7.63	13.15	16.01	20.52	39.88	45.76

(1) Fairfax County Water Authority (formerly Alexandria Water Co.) Contract expires 1991
(2) Does not include Towns of Manassas and Manassas Park or Quantico Reservation
(3) Does not include Quantico Reservation
(4) Total of Items 15 and 25

SOURCE: An Updating Report on Water Supply Facilities for Prince William County, Wiley and Wilson 1968

(b) By 1985 or 1990, a second source of supply must be developed from Salem Church Reservoir or Cedar Run near Brentsville. If the Town of Manassas Broad Run site cannot be used, one of these sites must be used for the authority supply.

(c) It is also possible that if Salem Church Reservoir materializes soon enough, it could be used as the sole source of supply for the Authority as could the previously recommended Cedar Run project if certain questions concerning Quantico Marine Base flooding and downstream release are answered favorably.

3. 1969 Wiley and Wilson Report - In September of 1969, Wiley and Wilson submitted a study entitled Raw Water Supply Sources for Prince William County, Virginia. This report supplemented the two earlier Wiley and Wilson studies. This report, limited in scope, dealt with the possibility of some of Quantico Marine Base being flooded from the Cedar Run impoundment mentioned in the earlier two reports. The 1969 Report concluded that "the development proposed at Cedar Run with the dam having a spillway at elevation 161 be undertaken and that the filter plant be constructed in the vicinity of the dam and water delivered from this point to the Greater Manassas Sanitary District as required". Also, with the filter plant at this location and in the continued interests of developments along Route 234 and Independent Hill, this allows the construction of a pipeline to Independent Hill, under most favorable conditions and from this point to the eastern portion of the County. A review of past actions by the Board of County Supervisors uncovered no resolutions either approving or adopting any one of the three Wiley and Wilson Reports cited above.

4. County-Wide Administrative Water Survey - 1970 - The Board of County Supervisors received a report entitled "Memorandum County-Wide Administrative Water Supply" from the consulting firm of Baldwin and Gregg-Langley, McDonald and Overman in January of 1970. Although primarily concerned with the administrative apparatus required to institute a County-Wide Water Authority, the report did address the question of future water supplies for the County. First, the Baldwin and Gregg report stated that "the existing service areas in the western portion of Prince William County are now dependent upon unreliable sources of water, offering other limitations, such as inadequate fire protection and inability of rapid service expansion". The Baldwin and Gregg report reviewed the earlier engineering studies concerning water supply for the County. They concluded that although the proposals "are sound ones, as they relate to a long range County-wide plan, their initial costs, due to limited development lead to the possible necessity of an alternate plan". The report stated it would presently appear appropriate to more fully utilize the existing sources of supply such as those of the Fairfax County Water Authority and even those of the Town of Manassas.

The Baldwin and Gregg report recommended that the Board of County Supervisors "make available all waters of Lake Jackson and the right of usage of the same by the Authority for the development of the desired improvements". This report also outlined a phased program whereby the eastern and western portions of the County would be connected by water lines. The initial phase proposed 24" transmission line running seventeen miles from Dale City and the Prince William Water Company lines to Lake Jackson. The second phase advocated a large transmission line heading to both the eastern and western portions of the County from the proposed impoundment on Cedar Run at Brentsville. Plate 7 illustrates the proposals of the 1970 Baldwin and Gregg report. The Board of County Supervisors resolution No. 13, dated August 13, 1970, accepted the recommendations and approved the County-wide Water Plan, Phase I. Although all parts of Phase I have not been constructed, construction of the 16" water line from Centreville to the Greater Manassas Sanitary District was a part of Phase I and has not been completed.

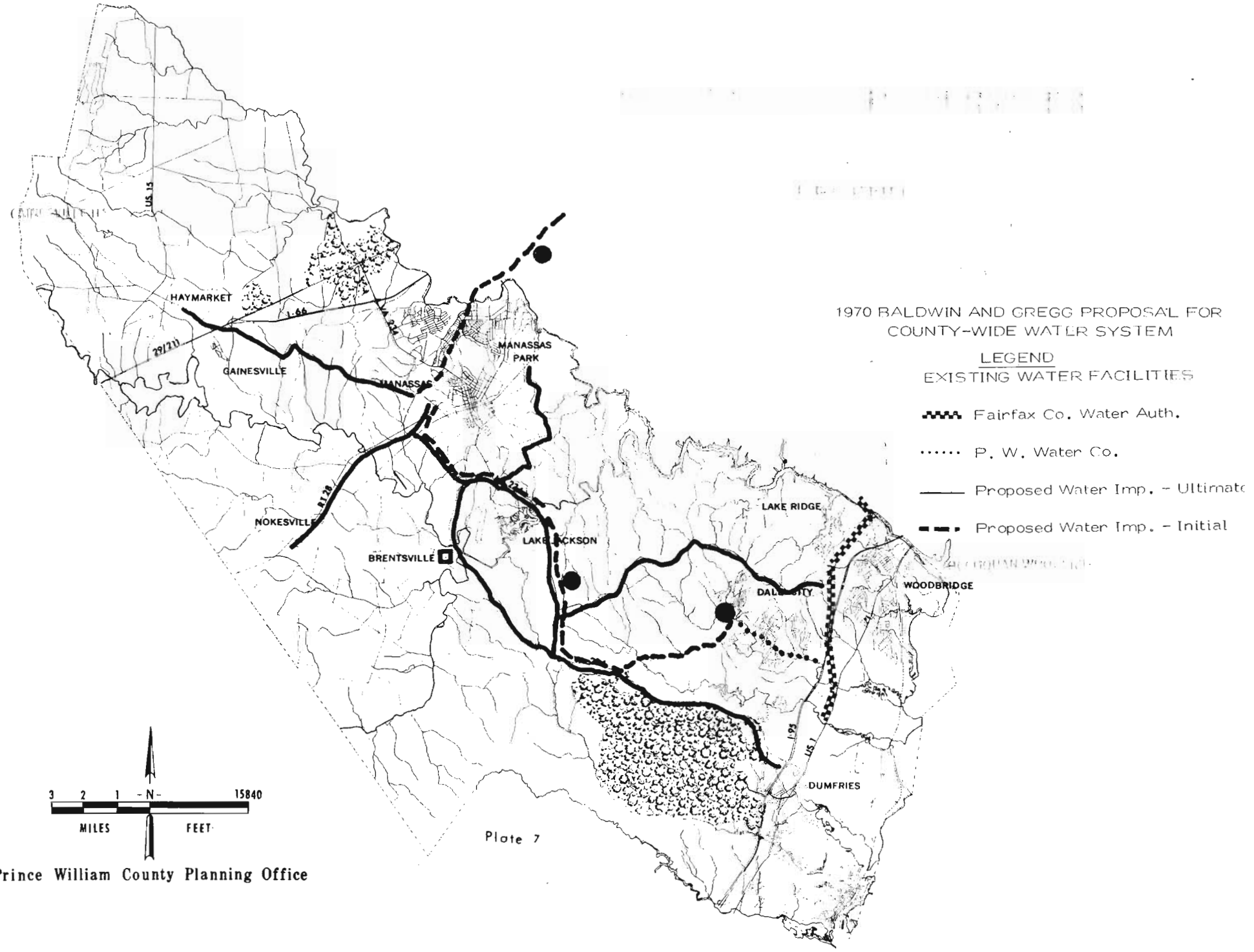


Plate 7

Prince William County Planning Office

5. 1973 Water Feasibility Study to Western Prince William County - The most recent report concerning water supply was submitted to the Board of County Supervisors in July, 1973. Entitled "Water Feasibility Report Relating to Water Service in the Prince William Regional Industrial Complex, the Marriott Corporation's Great America Theme Park, and the Gainesville Haymarket Area", this report made the following recommendations:

(a) On the short-term, the best solution to the problem of supplying water to the Regional Industrial Complex and to the Gainesville-Haymarket area is to purchase surplus water from the Town of Manassas.

(1) The Town and Prince William County could work out an agreement whereby the filter plant located on Broad Run could be increased from 4 to 8 mgd to provide additional surplus water.

(b) Regardless of the outcome of these negotiations between the Town and the County, the County will still need to meet it's long term water needs. When the water requirements of the entire County are considered, it becomes apparent that the Fairfax County Water Authority is now in the best position to offer this service.

(1) In the event that long term commitments cannot be obtained from the Fairfax County Water Authority, the County should consider developing its own central water system.

(c) Since the Greater Manassas Sanitary District can supplement its water supply needs with purchases from the Town of Manassas and the Fairfax County Water Authority, it is recommended that no new wells be drilled in the District until a cost benefit report has been made pointing out the relative merits of producing well water versus purchasing water from Manassas or the Water Authority.

6. Impoundments Studied on Bull Run - The present Prince William Board of County Supervisors has been planning for future water needs for the County. In 1973, members of the Board of County Supervisors of Prince William County met with members of the Fairfax County Board of Supervisors to discuss future water requirements in the Occoquan Basin. In March of 1973, the Prince William Board of County Supervisors authorized a feasibility study for construction of two multi-purpose dams in western Prince William County. The Study is to be conducted by the Soil Conservation Service of the United States Department of Agriculture. If constructed, the dams could provide flood control, fish and game, erosion control, a water supply and recreation. Both dam sites are in the Catharpin area of Prince William County. One is a 572 acre site on Bull Run near Sudley Church. The second, a 710 acre site, is located on Little Bull Run behind Route 701. This site would have to be developed in conjunction with Loudoun County. This study has not been completed.

7. Reservoir Adjacent to Proposed Upper Occoquan Sewage Authority Plant - Another possible water supply for Prince William County could be the reservoir which is scheduled to be built adjacent to the proposed Upper Occoquan Sewage Authority Treatment Plant. The Upper Occoquan Plant, programmed to open in 1975-76, will provide advanced waste water treatment. Conceivably, if the plant operates as planned, one could drink the recycled effluent. The Board of County Supervisors has requested information from the Upper Occoquan Sewage Authority to determine the possibility of using the effluent as a source of water for industry.

8. Salem Church Dam and Impoundment - As illustrated in two of the Wiley and Wilson Reports quoted earlier, many have recognized the possibility of the Salem Church Dam and its impoundment as a future water source for Prince William County.

While this is currently an authorized project of the Corps of Engineers, it has yet to be built. Recently, Virginia's Attorney General said that the transfer of water from the Rappahannock River basin to the Potomac basin is illegal under present state law. Some 60% of the water to be impounded in the Salem Church Reservoir would be destined for Potomac basin counties in Northern Virginia. In May of 1973, a representative of the Virginia Water Control Board told the United States Senate Appropriations Public Works sub-committee that they (SWCB) would just as soon see the Salem Church Dam project ended. The State Water Control Board spokesman said the Board was basing its opposition on the positions taken by other Northern Virginia city and county governments. The Water Control Board believes the Washington area could get its water cheaper from a proposed Potomac River dam at Verona. Presently, about 1.8 million dollars has already been spent on the Salem Church project and the Corps of Engineers is asking Congress for an additional $400,000 to continue planning.

PRINCE WILLIAM ROLE IN METROPOLITAN WASHINGTON FUTURE WATER SUPPLIES

The Water Element has outlined the present sources of water for Prince William County as well as reviewed a number of reports concerned with potential sources of water for the County. As an integral part of the metropolitan Washington Area, Prince William County's water supply is inextricably tied to the rest of the Metropolitan Area's water supply. For example, the report has already described the Fairfax County Water Authority's request as well as the Virginia-America Water Company's approved request to withdraw additional water from the Potomac River. As the report has already made clear, if both these requests are granted, it will mean that the Occoquan Reservoir will not be needed to serve large areas of Fairfax County and the City of Alexandria. The problem becomes the Potomac River's capacity to supply all the major water providers who currently use it as their main source of water, as well as the additional providers who would like to utilize it.

Presently, the City of Washington, most of suburban Maryland and parts of Northern Virginia are served by the Potomac River. If a drought were to occur, or if poisonous industrial discharges were released into the Potomac, the Washington area has only a one and one-half day back-up water supply. In contrast, Baltimore has one year's water reserve supply, and New York City has three years supply.

As the Washington Metropolitan area is forecast to continue to grow, the problem can only be compounded. The Chairman of the Fairfax County Water Authority projects that at the current rate of growth, by the year 2010, the estimated daily withdrawal from the Potomac River will be six times the flow of the river in 1966. The Potomac flow reached a low flow of 388 million gallons a day in 1966. On a summer day in 1971, 400 million gallons of water were used. Unless water can be stored and released in low flow periods or crisis situations, conceivably many people in the Washington Metropolitan area could be without water.

1. Planning on the Federal Level for the Potomac River Basin - Planning at the Federal level has been ongoing to rectify this situation. The United States Corps of Engineers prepared a report entitled 1963 Potomac River Basin Comprehensive Plan. It recommended that sixteen major reservoirs be built to augment low flow in the Potomac River Basin and to meet anticipated growth in the water requirements. When completed, these 16 reservoirs were to provide a dependable low flow on the Potomac at Washington of approximately 2970 mgd. The 1963 Plan outlined a number of alternatives. One of the alternative plans, called Plan II, consisted of constructing six reservoirs. These included the Bloomington, Royal Glen, Verona, Sixes Bridge, Brocks Gap, and Licking Creek Reservoirs. Plan II soon became labeled the "six pack". When acting as a system, these dams were projected to increase the dependable flow of the Potomac River by 1108 mgd.

   Currently, the Bloomington Reservoir and dam is under construction. In September of 1973, two Congressmen sponsored legislation that would authorize final design of the Verona and Sixes

Bridge Dams on upstream Potomac tributaries. If approved and funded by the Congress, the earliest estimated completion date for these two dams would be 1983. Construction of these two reservoirs will supply an additional 235 mgd flow on the Potomac in the Metropolitan area.

2. Planning at the Metropolitan Level for Future Water Supplies - Many at the metropolitan level are cognizant of the area's water supply problems and efforts are being made to plan for future water sources. Many agencies and organizations have been involved with this effort; yet, due to the fragmented jurisdictional nature of the problem, little substantial has been accomplished. To rectify this problem, in August of 1972, the Governors of Virginia and Maryland and the Mayor-Commissioner of the District of Columbia instituted the Washington Area Interstate Water Resources Program. In December of 1972, this task force presented a 1.6 billion dollar action program to their respective government heads designed to ensure that the Washington Metropolitan area has enough water for its residents. This program, to be financed by local, State and Federal funds, aimed at assuring the Washington area of an adequate water supply to the year 2000. The major elements of the Interstate Task Force Program are outlined below. Because the problems of water supply are interwoven with wastewater treatment programs, the Task Force's program combines both elements.

(a) Water Supply

(1) Construction of the Verona and Sixes Bridges reservoirs.

(2) Interconnection of major water supplies so that the full potential of present water supplies can be utilized and to meet emergencies caused by low flow or contamination.

(3) Provision of additional raw water storage in the Metropolitan Area including pumped storage.

(4) Reduction of demand by such measures as changes in plumbing codes and rate structures.

(5) Construction of the facilities for the emergency use of the Potomac River estuary and testing of prototype treatment facilities.

(6) Construction of additional treatment facilities and finished water storage.

(b) Wastewater Treatment

(1) Elimination of overflows of untreated wastewater. Where this is accomplished by temporary plants, conditions are specified.

(2) Completion of Blue Plains at the earliest possible date.

(3) Immediate construction of the Montgomery County wastewater treatment plant at the Dickerson site.

(4) Provision of adequate levels of treatment and fail safe features at existing upstream treatment plants.

(5) Planning for wastewater treatment facilities for Northern Fairfax and Loudoun Counties.

(6) Implementation of the Maryland plan for the Anacostia River Basin.

(7) Expansion of several existing wastewater treatment plants in both Maryland and Virginia where an overload now exists or may soon exist.

(8) Immediate construction of regional plants in eastern Prince William County, the Occoquan area, and the Central Patuxent area.

(9) Implementation of a new monitoring and reporting system to provide for a free exchange of information on performance of wastewater treatment plants and to sound an early warning of potential danger.

One of the key proposals of this program calls for the interconnection of major water supply systems in the area for maximum use of the existing supply facilities so that both treated and untreated water can be freely exchanged. The three independent systems (Fairfax County Water Authority, Washington Suburban Sanitary Commission, and the Washington Aqueduct System) serve approximately 95% of the water customers in the Washington Metropolitan area. These three water agencies are currently financing a study to examine the Task Force Recommendations, including the costs and feasibility of interconnecting their three systems.

PROJECTED WATER CONSUMPTION IN PRINCE WILLIAM COUNTY

A number of population projections have been made for Prince William County. Analyzing these projections, one finds a high degree of consensus among the various projections. For the purposes of planning for future water consumption, the following population projection by ten year increments will be utilized.

TABLE 21

POPULATION PROJECTIONS FOR PRINCE WILLIAM COUNTY

Year	Population
1980	200,000
1990	300,000
2000	400,000

As development continues to occur in the rural areas of Prince William County, it can be expected that these areas of the County which are not presently connected into public or private water systems will be brought into these systems. Therefore, it is assumed that in the future, the percentage of the County's population utilizing individual wells will decrease. By 1980, it is projected this percentage should be approximately 13%, and by 1990, 10%. This figure should remain fairly constant during the next ten year period.

1. Standards for Forecasting Demand - Standards for forecasting water demand vary considerably. For instance, a recent report to the Environmental Protection Agency on the interrelationship of land use planning and water quality management stated that a good figure for domestic water damand was 100 gallons per capita per day. Currently water consumption per capita per day varies within the County. In the Occoquan-Woodbridge Sanitary District, water consumption is approximately 80 gallons per capita per day, while in the Dumfries-Triangle Sanitary District, it is approximately 90 gallons per capita per day. The primary reason for the higher per capita figure in the Dumfries-Triangle is that this Sanitary District has a higher percentage of its water utilized by industrial and commercial uses. It should be noted, however, that the basis for deriving the per capita figure is based on actual metered water to the individual consumers. Water used for fighting fires, water used illegally from hydrants, or water leakage is not billed. Therefore, actual water consumption in the District is greater than just the sum of the per capita figures metered. For example, according to the Greater Manassas Sanitary District's records, water pumped from the seven wells was 1.83 mgd on April 11, 1972 and 1.49 mgd on November 7, 1972 or 129 gallons per capita per day and 101 gallons per capita per day respectively. However, the water actually billed averaged 66 gpcd in 1972, 70 gpcd in 1971, and 67 gpcd in 1970. According to the Consulting Engineers, this indicates considerable water lost through leakage and/or low reading meters. Although increased efforts

to increase maintenance on water lines will undoubtedly reduce leakage, it should be pointed out that Sanitary Districts will continue to need greater amounts of water than just the per capita figures derived through billing actual units. As the County is aggressively seeking increased commercial and industrial land uses, it can be forecast that per capita usage will increase as the County secures these types of land uses.

2. Historical Trends - Historically, water usage per capita has been increasing. This is due to a number of factors. For instance, utilization of garbage disposals and dishwashers has been increasing as these items become standard in all new homes. Likewise, many homes are being built with more than one bathroom. Historic data from a number of cities and towns in Virginia confirms the trend of a gradual increase in the use of water.

When planning for public water supplies, as in planning for other utilities, provision must be made for peak or maximum periods. For example, if one plans a water supply facility designed for annual averages, this supply will most likely be inadequate during certain days when water usage is high. However, it should also be pointed out that peak usage may only occur once every ten or twenty years. Probability of such an occurence is also limited to the summer months. With this taken into account, the decision-maker must weigh the extreme costs of meeting peak water demands if they are to be infrequent occurrences. An alternative to this would be to be aware of the peak needs, and to try and reduce the demand for water during these peak occurrences through conservation measures.

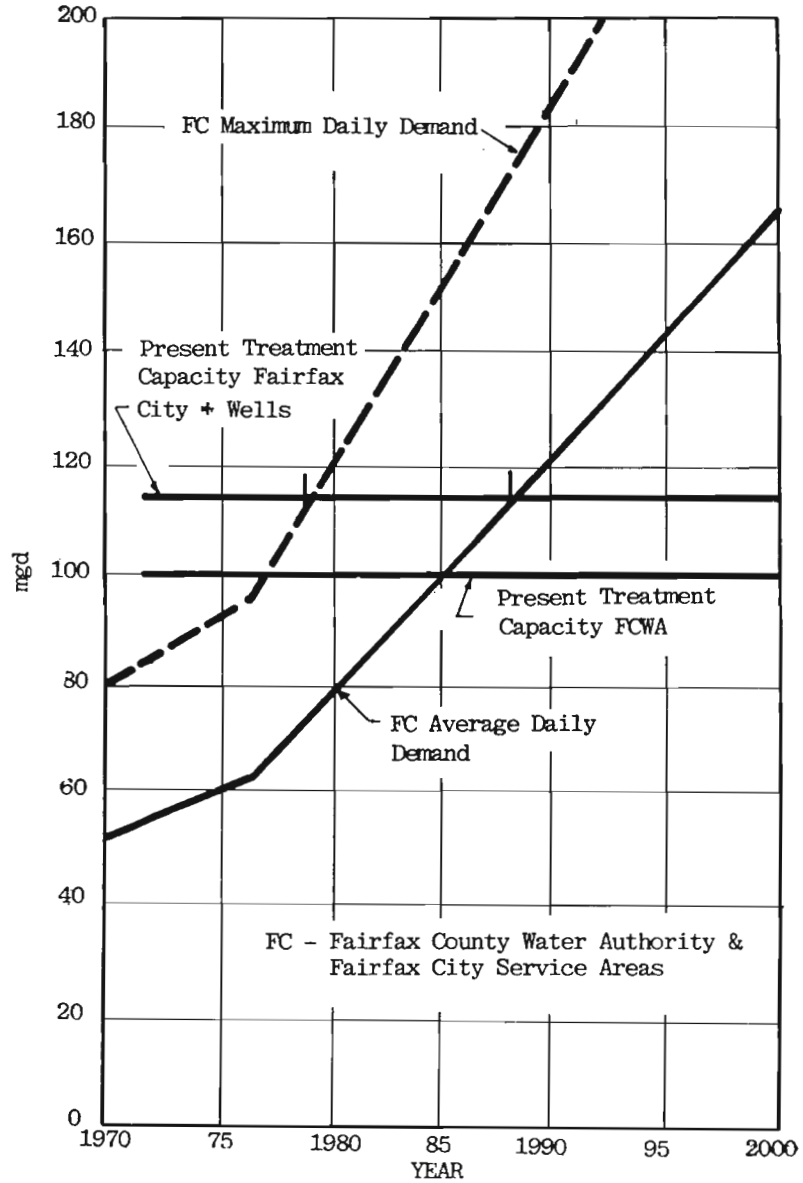
3. Figures to be Employed in Forecasting Water Demand - Based on the facts outlined above, this report will employ per capita figures of 110 gallons per capita in 1980, 120 gallons per capita in 1990, and 130 gallons per capita in the year 2000. It should be pointed out that consumption figures must be continually monitored to record any gross variations over time. In 1980, a total County population of 200,000 is forecast. At that time, it is estimated a population of 26,000 will be outside of areas served by public or private water systems. Based on a standard of 110 gallons per capita per day in 1980, the remaining population will need approximately 19.1 mgd of water. In 1990, a total County population of 300,000 is forecast. After deducting 10% of this population, water demand for the population on public and private water systems will be based on a population of 270,000. Employing a per capita daily water consumption of 120 gallons per capita per day, demand for water in 1990 will be approximately 32.4 mgd. For the year 2000, the population forecasted to be utilizing public and private water systems is 360,000. Employing a per capita consumption of 130 gallons of water per day, the approximate demand by the year 2000 will be 46.8 mgd. Projected maximum day water demand for each of the three years outlined above can be derived by employing a standard coefficient factor of 1.5 times the average daily demand. The projected maximum day water demands would be 28.5 mgd for 1980, 48 mgd for 1990, and 69 mgd for the year 2000.

4. Future Water Supply Deficits in Prince William County Highlighted in Interstate Task Force Basis for Planning Report - The Washington Area Interstate Water Resources Task Force has examined in detail the present and future water supply problems in the Washington Metropolitan area. In November of 1972, the Task Force published a paper entitled The Basis for Planning an Action Program for the Washington Metropolitan Area. This document is most helpful in illustrating water supply problems in Prince William County based on present supplies as well as programmed expansions. The Task Force's document is particularly appropriate in that in one section of the report, future water demand is based on population projections based on forecasts by

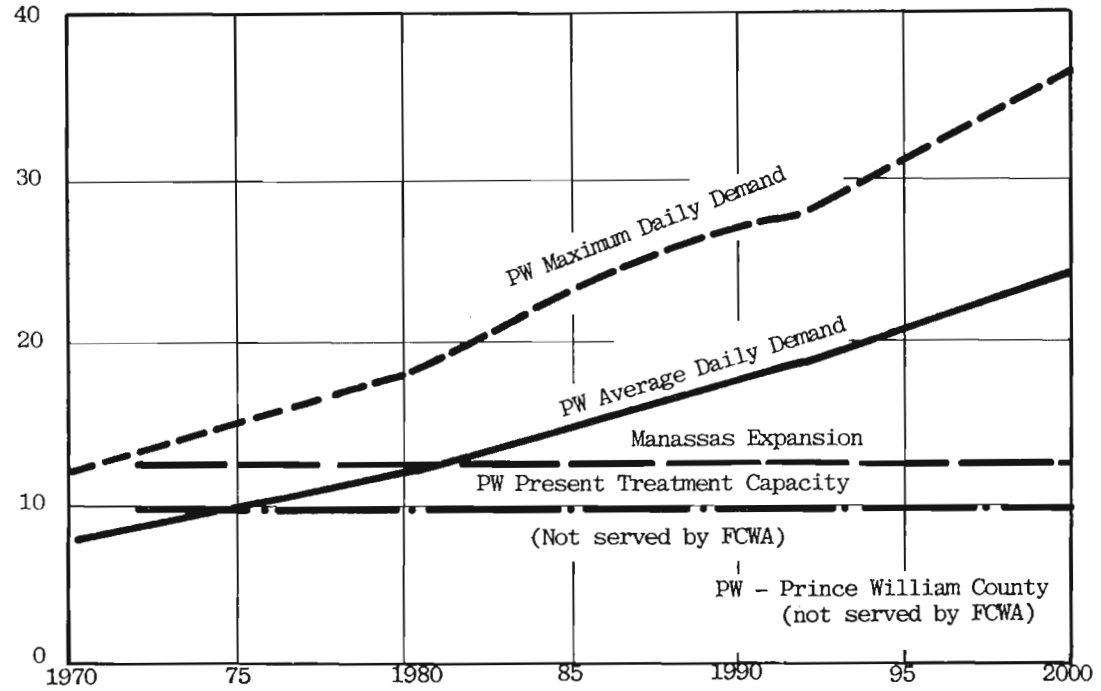
local jurisdictions. For Prince William County, the report utilized a total County population of 199,000 in 1980, 319,000 in 1990, and 400,000 in the year 2000. For planning purposes, these figures are very close to the population forecasts already outlined earlier in the report and can be used for comparative purposes. As made clear earlier in this report, the Occoquan Reservoir is presently the major source of water for eastern Prince William County. Graph 2 is taken from the Interstate Task Force's Basis for Planning Document. It shows that based on local population forecasts, the Fairfax County Water Authority and Fairfax City have 114 mgd capacity in their water treatment plants and wells, (i.e. Occoquan Reservoir) This capacity is forecast to meet the projected average daily demand until 1988 and the projected maximum daily demands until 1979. Estimating that the treatment plants could operate for several days of rated capacity, the maximum daily demand could be met until 1984 for relatively short periods. As this makes clear, the Fairfax County Water Authority must currently actively seek additional treatment plant capacity or means of purchasing water from other sources in the near future.

The Interstate Task Force also examined the present and future water sources for the other half of Prince William County not presently served by the Fairfax County Water Authority. This is basically western Prince William County. Graph 3 shows that the present water treatment capabilities in western Prince William County will not now currently meet maximum daily demands, and with expansion of the Manassas supply, will only meet average daily demands through the mid-1980's. This data points up to the need for increased treatment capability within western Prince William County in the immediate future.

RELATIONSHIP OF TREATMENT CAPACITIES OF FAIRFAX COUNTY WATER AUTHORITY TO LOCAL PERSPECTIVE DEMAND PROJECTIONS



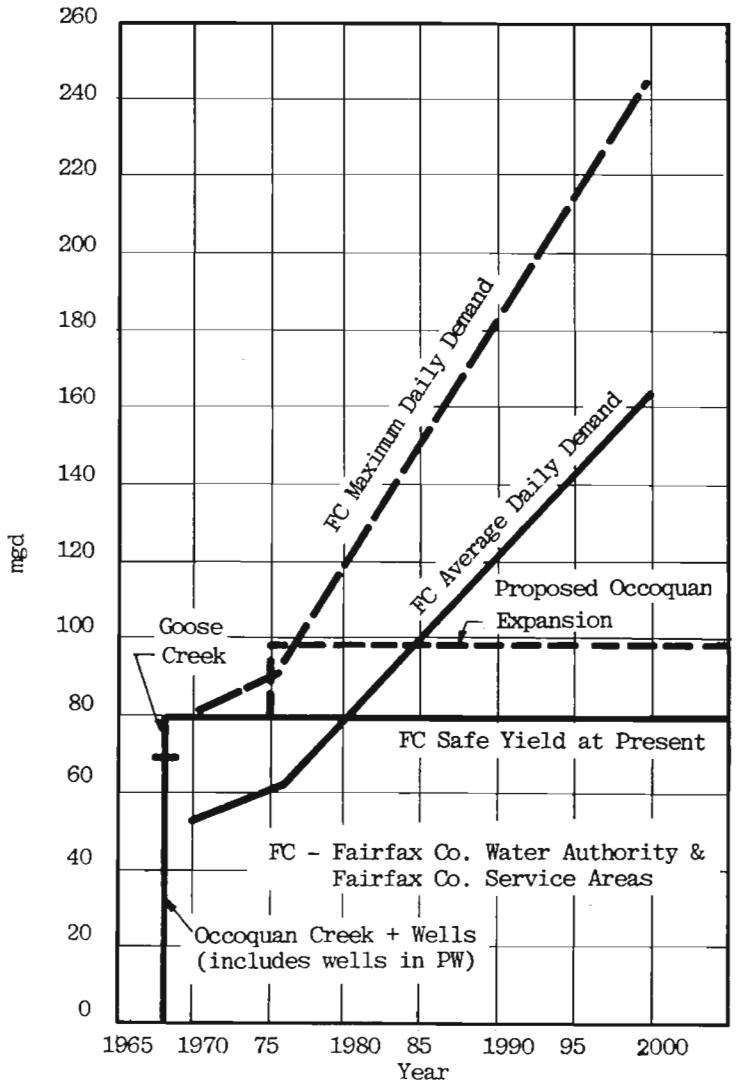
RELATIONSHIP OF TREATMENT CAPACITIES IN WESTERN PRINCE WILLIAM COUNTY TO LOCAL PERSPECTIVE DEMAND PROJECTIONS



After examining the treatment capabilities within the Metropolitan Washington area, the Interstate Task Force Basis for Planning document also examined the safe yields of the major streams which provide water to the Metropolitan Washington area.

Graph 4 shows that the combined safe yields from the Occoquan Creek and Goose Creek plus wells in the service area is 80.5 mgd. The present safe yield does not meet the projected maximum daily demand, while it meets the projected average daily demand until 1980. Storage in the Occoquan Reservoir could meet the projected maximum daily demand for periods of 100 days or more to the year 1985. Graph 4 shows that by increasing the Occoquan Reservoir Dam height, an additional 19 mgd safe yield could be added giving a total of 99.5 mgd safe yield. Again, to meet the projected maximum daily demand in the year 2000 additional sources of water supply with safe yields of 150 mgd, or equivalent in storage, will be needed.

RELATIONSHIP OF SAFE YIELD OF OCCOQUAN CREEK
TO LOCAL PERSPECTIVE DEMAND PROJECTIONS



PLANNING FOR NEEDED FUTURE WATER SUPPLY IN PRINCE WILLIAM COUNTY

This report has summarized the existing water consumption in Prince William County, Presently, excluding water consumed through individually owned wells, total water consumption in Prince William County is approximately 9 million gallons per day. The report has pointed out that by 1980, total County water needs will increase by approximately 10 mgd to 19.1 mgd. In 1980, needs will increase by 23 mgd, while by the year 2000, County-wide water needs will be 37 mgd more than currently consumed in Prince William County.

A great many alternatives are presently available to the County to provide this projected need. Presently, the Fairfax County Water Authority provides approximately 7 mgd of water to Prince William County. In the future, it has proposed to increase this to approximately 12.5 mgd in 1980, 20.4 mgd in 1990, and 29.3 mgd in the year 2000. These amounts do not reflect any water from the Fairfax County Water Authority to the western parts of Prince William County. As made clear by the Interstate Task Force findings, the Water Authority must continue to expand its water sources as well as its treatment capabilities if it is to meet the future demand of its current service area. If the Fairfax County Water Authority was to serve Prince William County with the amounts outlined above, the areas not primarily served by the Fairfax County Water Authority (i.e., western Prince William County) will need to have water sources capable of providing approximately 7 mgd in 1980, 12 mgd in 1990, and 17 mgd by the year 2000.

The report has already made clear that the groundwater supplies in western Prince William County are at capacity and are probably not a reliable source of water in the future. The report has outlined the existing surface water supplies in Prince William County, as well as the potential surface water supplies that could be impounded. Prince William County must undertake the following program to be prepared to adequately provide the County's future water needs. The County must realize that a number of

alternatives and combination of alternatives are available to the County in planning for future water needs. However, the planning and execution of waterworks often takes a great deal of lead time. Therefore, it is incumbent upon the County that an active future water supply program is undertaken.

1. Short and Long Range Water Supply Plan -

(a) Because the County's water needs are tied to the water supplies of the entire metropolitan Washington area, the County should endorse programs currently aimed at increasing the Metropolitan area's water supply. These include:

(1) Support for the Verona and Sixes Bridge Dams and impoundments on the Potomac River.

(2) Interconnection of the three major water providers in the Metropolitan Washington area.

(3) Support for the entire program of the Washington Area Interstate Water Resources Program.

(b) The County should make clear whether it intends to continue to receive water from the Fairfax County Water Authority's impoundment at Occoquan. If so, the County must financially support the expansion program of the Fairfax County Water Authority to make sure adequate future supplies will be available.

(c) The County must seek additional water sources in western Prince William County. The current groundwater sources should not be relied on to produce the high volume of water needed in the future. In the short run, the County has several alternatives:

(1) The County can seek to buy additional water from the Fairfax County Water Authority's Centreville lines.

(2) The County can seek to buy additional water from the Town of Manassas' impoundment or Broad Run.

The costs and benefits of both these alternatives should be carefully weighed before either alternative or a combination of the two alternatives is pursued. In the long run, the County is going to need larger amounts of water than either the Town of Manassas or the Fairfax County Water Authority can provide. The costs and benefits of the following alternatives or combinations of alternatives must be closely examined by the County before seeking a long range water supply.

(1) The County must ascertain whether the Salem Church Dam will be built and operable by the mid-1980's. If so, it is conceivable that water from this source could provide for Prince William's water needs.

(2) The County should seek information from the Town of Manassas concerning the feasibility of increasing the Broad Run impoundment to provide 17-20 mgd.

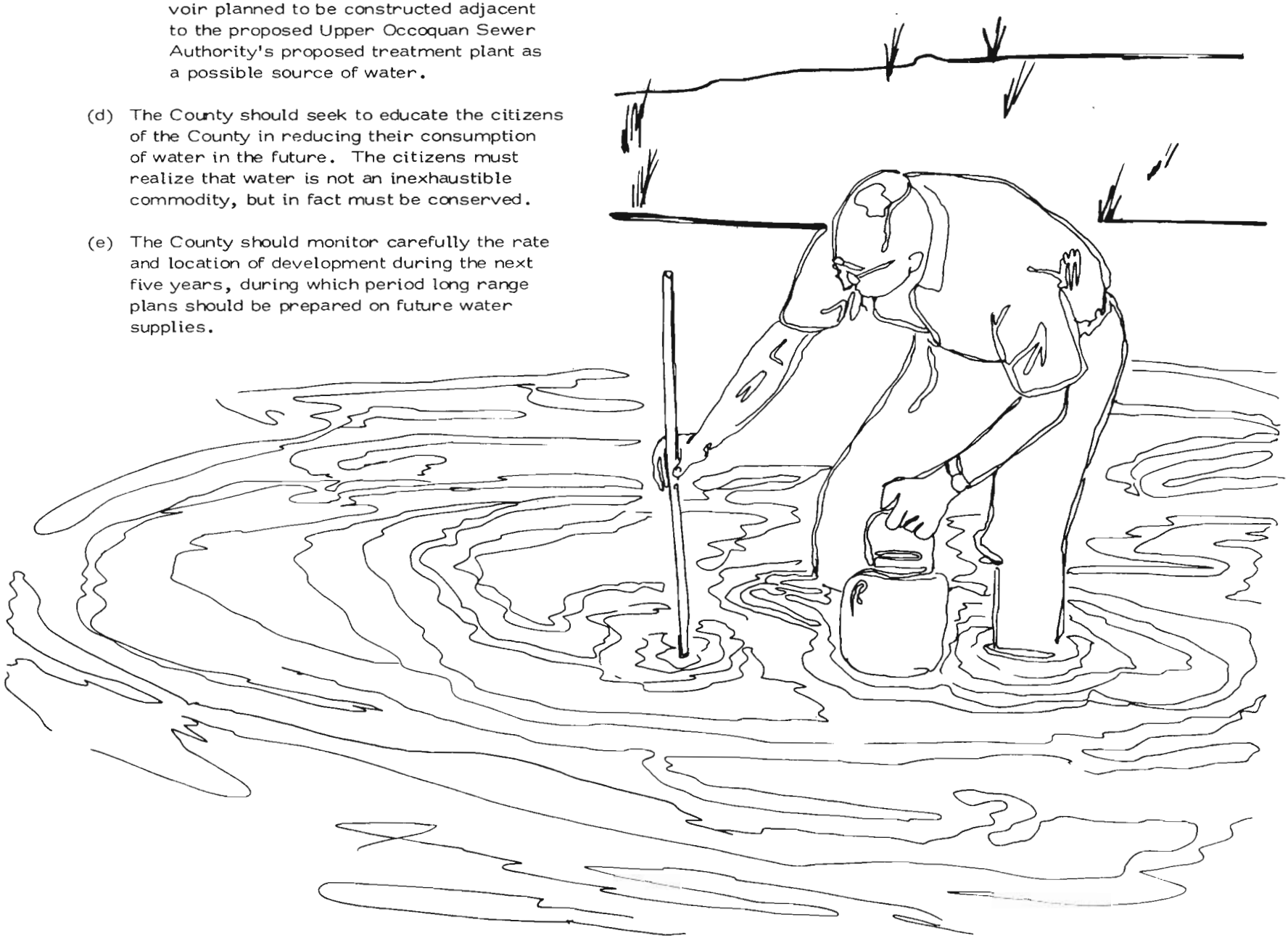
(3) If the two long range sources are not feasible, the County should implement the recommendation of the 1966 Wiley and Wilson report which recommended utilizing the combination of Lake Jackson and impoundment on Cedar Run.

(4) The County should also examine the possibilities deriving from the possible construction of the two PL 566 Dams under study by the Soil Conservation Service Study. Also, the County must monitor the adequacy of the future reser-

voir planned to be constructed adjacent to the proposed Upper Occoquan Sewer Authority's proposed treatment plant as a possible source of water.

(d) The County should seek to educate the citizens of the County in reducing their consumption of water in the future. The citizens must realize that water is not an inexhaustible commodity, but in fact must be conserved.

(e) The County should monitor carefully the rate and location of development during the next five years, during which period long range plans should be prepared on future water supplies.



4 *Implementation Policies for Water and Sewer Plan*

The following policies are intended to serve as a guide for consistent action for the County to accomplish the objectives and programs of the Sewer and Water Facilities Plan. The policies should be utilized by elected and appointed decision makers as well as agencies whose responsibilities influence sewer and water services. They should provide a consistent approach to implementing the plan, as well as a guide for continued planning efforts in the future.

POLICIES TO ALLEVIATE IMMEDIATE SEWER AND WATER PROBLEMS WITHIN PRINCE WILLIAM COUNTY

1. The County should give first priority to completing the Yorkshire Sanitary Sewer Project by seeking the State Water Control Board's approval to increase the certified flow at the Greater Manassas Sanitary District's Treatment plant so that the Yorkshire Project may be completed prior to the opening of the Upper Occoquan Regional Plant. County officials should secure Federal and State aid for this project.

2. The County should continue to coordinate its efforts to provide water and sewage services to the Prince William Industrial Complex with the need to ameliorate the existing water and sewer problems in the Gainesville-Haymarket area.

3. The County should continue to seek Federal/State funding for the repair of the sewer line in the Nokesville Sewer District.

4. The County should expedite the Independent Hill water project by seeking clarification over whether federal funds are available or whether the project must be funded by the Dumfries-Triangle Sanitary District.

5. The County should adopt the following policies and programs to serve low-income rural residents who have water and sewer problems but are in areas of the County not planned to be served by sewer and water service in the 1974-1979 period.

   a. Encourage eligible rural residents to utilize Federal and State programs designed to repair individual sewer and water systems. An example of such a program is the low interest rehabilitation loans available from the Farmers Home Administration.

   b. The County should establish a Home Rehabilitation Fund which eligible low-income residents could utilize.

   c. The County should institute the Comprehensive Approach already outlined and reproduced below:

      (1) The Public Health Department and Social Services Department should provide the Planning Office and the County's sewer and water officials with information on families without plumbing and their ability to pay for water and sewer services.

      (2) The Planning Office and the Sanitary District officials should advise the Public Health and Social Service Departments of the type of assistance available.

      (3) The County should designate a water/sewer specialist to assist low-income families in obtaining water and sewer services.

   d. When a low-income resident who lacks adequate water and sewer services lives within an area served by public water and sewer services, the County should institute extended payment plans where such a resident may pay connection charges over an extended time period instead of having to make a single large payment.

6. The County will seek to abate the current infiltration problems in the County, and will work to avoid having these problems in the future.

7. Update and adopt a Water Supply Ordinance.

POLICIES TO AMELIORATE FUTURE SEPTIC SYSTEMS PROBLEMS

1. Update and adopt a Sewer Disposal Ordinance.

2. Discourage future development that depends upon septic tanks for disposal of wastes, except on sites which are demonstrably suitable for long-term septic tank use.

POLICIES TO IMPROVE COORDINATION AMONG THE PROVIDERS OF SEWAGE AND WATER SERVICES

1. The County supports a regional approach to sewage treatment planning in Prince William County.

2. The County should arrive at a decision on the merger of its Sanitary Districts such as the current proposal to merge the Occoquan-Woodbridge and Dumfries-Triangle Sanitary Districts.

POLICIES TO OBSERVE WHEN EXTENDING WATER AND SEWER SERVICES DURING THE 1974-1979 PERIOD

1. Allow extension of water and sewer services only within areas designated in Plate 5 of the Sewer Element.

2. Refrain from rezoning land to more intensive uses except in areas shown on Plate 5 or unless it can be proved that sewer is not needed. Any suitable sewage system must meet all applicable criteria, and the rezoning must otherwise be shown to be in the public interest and consistent with other County policies.

3. Site and subdivision plans shall be approved only if the subject property lies in the areas shown on Plate 5 or if the Board of County Supervisors has approved another form of sewage disposal for the property.

4. The County shall adhere to the policies outlined in the Sewage Allocation Policy, approved by the Board of County Supervisors.

5. The County should adopt and implement a Capital Improvements Program which facilitates development only in the areas shown on Plate 5 suitable for sewer service during the next five year period.

6. The County must seek to provide the proper combination of restrictions and incentives to guide public investments and the private market in accordance with the Five Year Water and Sewer Plan.

7. Builders and developers of land should be encouraged to contribute their fair share of providing sewage facilities. This is supported by Title 15.1-510.7 of the Code of Virginia.

8. The County must be given the option of owning and maintaining any private sewer and water systems constructed, and all such systems must be constructed to specifications approved by the Board of County Supervisors.

9. The County should encourage innovative ways of treating sewage which are consistent with the environmental and health-related standards of the County.

10. Small private treatment plants in rural areas should not be allowed to expand unless it can be shown these plants will serve areas designated for extension of sewer services in the next five year period or unless it is in the public interest.

11. Encourage innovative water handling systems such as parallel water supply lines and recycling of water in closed systems.

PROGRAMS AND POLICIES TO ENSURE AN ADEQUATE COUNTY WATER SUPPLY

1. The County should immediately begin planning for its short and long range water supply needs. The County should undertake the following actions to arrive at a comprehensive County-wide system design for water distribution.

   a. Support programs which will increase the water flow as well as the storage capability of the Potomac River. This would include endorsing the Verona and Sixes Bridge Dams and Impoundments.

   b. Support the program of the Washington Area Interstate Water Resources Program. In particular, advocate the interconnection of the three major water providers in the Metropolitan Washington area.

   c. Determine whether the County intends to continue to receive water from the Fairfax County Water Authority's impoundment at Occoquan. If so, the County must financially support the expansion program of the Fairfax County Water Authority to make sure adequate future supplies will be available.

   d. The County must seek additional water sources in western Prince William County. Groundwater sources should not be relied on to produce the volume of water needed in the future.

      (1) In the short range, the County should seek firm commitments to buy water from either the Fairfax County Water Authority through its Centreville line or from the Town of Manassas. A cost/benefit study must determine the merits of either of these two alternatives or a combination of the two sources.

      (2) In the long run, additional amounts of water will be needed which will probably not be able to be provided by the Fairfax County Water Authority or the Town of Manassas. The costs and benefits of the following alternatives or combinations of alternatives must be closely examined by the County before seeking a long range water supply.

      (3) The County must ascertain whether the Salem Church Dam will be built and operable by the mid 1980's. If so, it is conceivable that water from this source could provide for Prince William water needs.

      (4) The County should seek information from the Town of Manassas concerning the feasibility of increasing the Broad Run impoundment to provide 17 - 20 mgd.

      (5) If the two long range sources are not feasible, the County should implement the recommendation of the 1966 Wiley and Wilson report which recommended utilizing the combination of Lake Jackson and an impoundment on Cedar Run.

      (6) The County should also examine the possibilities deriving from the possible construction of the two PL 566 Dams under study by the Soil Conservation Service Study. Also, the County must monitor the adequacy of the future reservoir planned to be constructed adjacent to the proposed Upper Occoquan Sewer Authority's proposed treatment plant as a possible source of water.

2. The County should seek to educate the citizens of the County in reducing their consumption of water in the future. The citizens must realize that water is not an inexhaustible commodity, but in fact must be conserved.

3. The County should monitor carefully the rate and location of development during the next five years, during which period long range plans should be prepared on future water supplies.

TABLE OF ABBREVIATIONS

ASCE	American Society of Civil Engineers
BOCS	Board of County Supervisors
BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand
DCSD	Dale City Sanitary District
DO	Dissolved Oxygen
DTSD	Dumfries-Triangle Sanitary District
EPA	Environmental Protection Agency
FCWA	Fairfax County Water Authority
FHA	Farmers Home Administration
GMSD	Greater Manassas Sanitary District
gpd	gallons per day
gpcd	gallons per capita per day
mgd	million gallons per day
N	Nitrogen
NVPDC	Northern Virginia Planning District Commission
OWSD	Occoquan-Woodbridge Sanitary District
P	Phosphorus
PWC	Prince William County
RPC	Residential Planned Community
SD	Sanitary District
SWCB	State Water Control Board
UOSA	Upper Occoquan Sewage Authority
USGS	United States Geological Survey
W & W	Wiley & Wilson
YSD	Yorkshire Sanitary District

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